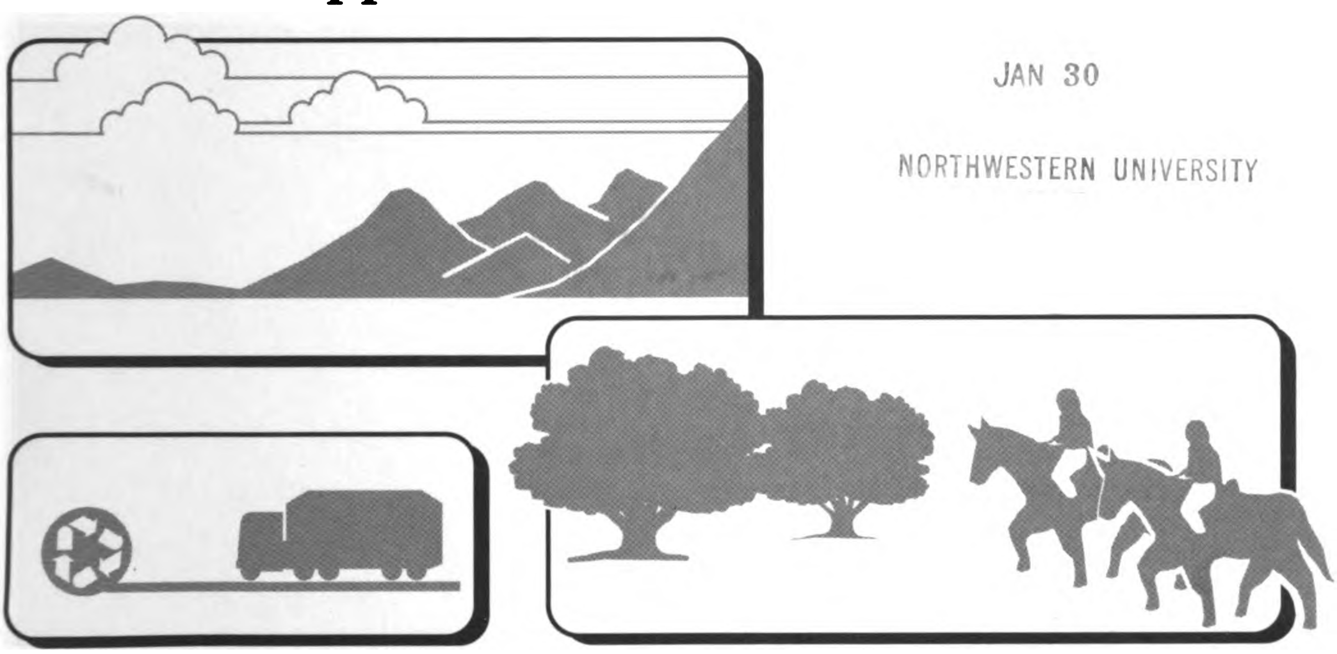
Draft Environmental Impact Report/ Environmental Impact Statement

SCH. No. 89032935
Conditional Use and Oak Tree Permit # 88573 - (5)

Proposed Elsmere Solid Waste Management Facility

Technical Appendices



U.S. Department of Agriculture, Forest Service

Los Angeles County Department of Regional Planning

DAMES & MOORE

January 1995

Draft
Environmental Impact Report/ Environmental Impact Statement

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Proposed Elsmere Solid Waste Management Facility

Technical Appendices

Prepared For:

U.S. Department of Agriculture, Forest Service
Los Angeles County Department of Regional Planning

Prepared By:

DAMES & MOORE
6 HUTTON CENTRE DRIVE, SUITE 700
SANTA ANA, CALIFORNIA 92707
(714) 433-2000

This report printed on recycled paper.

January 1995

TECHNICAL APPENDICES

APPENDIX A

INITIAL STUDY AND SCOPING REPORT

A:001\eis.toc

PROJECT NUMBER: 88573

STAFF USE ONLY

CASES:

* * * * INITIAL STUDY * * * *

COUNTY OF LOS ANGELES
DEPARTMENT OF REGIONAL PLANNING

GENERAL INFORMATION

Map/Case Date: 12-08-88 Staff Member: COOK

Thomas Guide: 127 / 6 H - 7 & 8 USGS Quad: SAN FERNANDO

Location: INTERSECTION OF OLD SAN FERNANDO ROAD + HWY. 14

Description of Project: CONDITIONAL USE PERMIT FOR CONSTRUCTION AND OPERATION OF MUNICIPAL / NON-HAZARDOUS WASTE LANDFILL AND APPURTENANT SUPPORT FACILITIES.

Gross Area: 1300 ac

Environmental Setting: SITE IS IN A NATURAL, UNDEVELOPED STATE AND CAN BE DESCRIBED AS A MOUNTAINOUS VALLEY. SCRUB CHAPPAREL, NATIVE SMALL MAMMAL BIRDS AND REPTILES ARE PRESENT. POSSIBLY OAK TREES IN LOWER VALLEY AREAS. THE NATIONAL FOREST IS TO THE EAST AND VACANT LAND IS TO THE WEST.

Zoning: A2-1 / A2-5 General Plan: NON URBAN & OPEN SPACE

Community/Areawide Plan: SANTA CLARITA VALLEY - HILLSIDE MGMT OPEN SPACE

Prior projects in area:

Project Numbers	Description

NOTE: For EIR's, above projects are not sufficient for cumulative analysis.

REVIEWING AGENCIES

Responsible Agencies

- [ ] None
- [x] Regional Water Quality Control Board
  - [x] Los Angeles Region
  - [ ] Lahontan Region
- [ ] Coastal Commission
- [ ] ____________

Trustee Agencies

- [ ] None
- [x] State Fish and Game
- [ ] State Parks
- [x] Army Corps Engrs.
- [ ] ____________

Special Reviewing Agencies

- [ ] None
- [ ] Topanga-Las Virgenes Conservation District
- [ ] Santa Monica Mountains Conservancy
- [ ] National Parks
- [x] National Forest
- [ ] Edwards Air Force Base
- [x] CITY OF SANTA CLARITA
- ✓ COUNTY PARKS
- ✓ COUNTY ~~HEALTH~~

ADDED 1/11:

- ✓ CA WASTE MGMT. BD.
- ✓ PUBLIC WORKS, WASTE MGMT. D

ADDED 9/26:

- ✓ COUNTY SANITATION
- ✓ STATE CLEARINGHOUSE
- ✓ U.S. FISH & WILDLIFE

Regional Significance

- [ ] None
- [ ] SCAG Criteria
- [x] Air Quality
- [ ] Water Resources
- [ ] Santa Monica Mtns Area

ANALYSIS SUMMARY (See individual pages for detai...

IMPACT ANALYSIS MATRIX:

CATEGORY	Factor	PAGE	No Impact/Insignificant Impact	Significant Impact	Potential Concern
NATURAL HAZARDS	Geotechnical	5		✓	ACTIVE FAULT, UNSTABLE [illegible]
	Flood	6		✓	FISH & GAME CONCERN, BLUELINE STREAM
	Fire	7		✓	HIGH FIRE HAZARD
	Noise	8		✓	INCREASE NOISE LEVELS
NATURAL RESOURCES	Water Quality	9		✓	SEPTIC W/ SEVERE LIMITATIONS
	Air Quality	10		✓	ODORS / REGIONAL SIGNIF
	Biota	11		✓	RIPARIAN, POSS. OAK TREES
CULTURAL RESOURCES/ VISUAL	Cultural Resources	12		✓	DRAINAGE [illegible]
	Visual Qualities	13		✓	COUNTY TRAILS MAY BE VIS. FROM SITE
SERVICES	Traffic/Access	14		✓	TRIP GENERATION
	Sewage Disposal	15	✓		
	Education	16	✓		
	Fire/Sheriff	17	✓		
	Utilities	18		✓	POSS. MAJOR WATER CONSUMPTION
OTHER	General	19		✓	
	Environ. Safety	20		✓	HAZ. MATERIALS PRESSURIZED TANKS

DETERMINATION: On the basis of this Initial Study, the Department of Regional Planning finds that this project qualifies for the following environmental document:

Preliminary	FINAL	
☐	☐	**NEGATIVE DECLARATION**, inasmuch as the proposed project will not have a significant effect on the environment.
☐	☐	**NEGATIVE DECLARATION**, inasmuch as the changes required for the project will reduce impacts to insignificant levels (see "Conditions", page 4)
☑	☑ 3-9-89	**ENVIRONMENTAL IMPACT REPORT**, inasmuch as there is substantial evidence that the project may have a significant impact due to factors listed above as "significant".

☐ Determination appealed—see attached sheet.

Environmental Finding (Negative Declarations):

☐ ND An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was determined that this project will not exceed the established threshold criteria for any environmental/service factor and, as a result, will not have a significant effect on the physical environment.

☐ NDC An Initial Study was prepared on this project in compliance with the State CEQA Guidelines and the environmental reporting procedures of the County of Los Angeles. It was originally determined that the proposed project may exceed established threshold criteria. The applicant has agreed to modification of the project so that it can now be determined that the project will not have a significant effect on the physical environment. The modification to mitigate this impact(s) is identified in the Acceptance Letter included as part of this Initial Study.

NOTE: Findings for Environmental Impact Reports will be prepared as a separate document following the public hearing on the project.

Reviewed by: [signature] Date: 12-20-88

AK 12/20/88

PROJECT CHANGES/CONDITIONS

☐ Prior to ( ) recordation of the final map ( ) issuance of a building permit and as a means of mitigating potential environmental impacts, it must be demonstrated to the satisfaction of the Regional Planning Commission that sewer connection permits can be obtained from ( ) County Sanitation District No.___ ( ) Las Virgenes Municipal Water District or its legal successor that meet the requirements of the California Regional Water Quality Control Board pursuant to Division 7 of the Water Code.

☑ Prior to alteration of any streambeds, and as a means of mitigating potential environmental impacts, the applicant shall enter into an agreement with the California State Department of Fish and Game, pursuant to Sections 1601 through 1603 of the State Fish and Game Code.

☐ Prior to ( ) tentative approval ( ) scheduling before the Zoning Board ( ) scheduling before the Regional Planning Commission, and as a means of mitigating potential environmental impacts, the applicant shall submit an archaeology report for the entire project site (unless otherwise noted) prepared by a qualified archaeologist, and comply with mitigation measures suggested by the archaeologist and approved by the Department of Regional Planning.

☐ Prior to ( ) tentative approval ( ) scheduling before the Zoning Board ( ) scheduling before the Regional Planning Commission, and as a means of mitigating potential environmental impacts, the applicant shall agree to suspend construction in the vicinity of a cultural resource encountered during development of the site, and leave the resource in place until a qualified archaeologist can examine them and determine appropriate mitigation measures. The applicant shall agree to comply with mitigation measures recommended by the archaeologist and approved by the Department of Regional Planning.

☐ As a condition of ( ) final approval ( ) the grant ( ) approval of the zoning ordinance, and as a means of mitigating potential environmental impacts, the applicant shall dedicate to the County of Los Angeles, ( ) the right to prohibit construction over an area demarcated on the ( ) tentative map ( ) plot plan, ( ) construction of more than one residence or commercial unit and related accessory building on any one lot on the project site. A note to this effect shall be ( ) placed on final map or on the Grant Waiver ( ) recorded on the title

☐ Prior to ( ) tentative approval ( ) recordation of the final map ( ) scheduling before the Zoning Board ( ) scheduling before the Regional Planning Commission, and as a means of mitigating potential environmental impacts, the applicant shall drill and test flow a well(s) to the satisfaction of the Department of Public Works/Engineering Division. A warning note shall be ( ) placed on the final map and in the CC&Rs ( ) recorded on the title, indicating that the area has a limited groundwater supply and that water may not be available during periods of severe drought. A copy of the ( ) CC&Rs shall be submitted to the Department of Regional Planning and subsequently recorded with the final map ( ) title shall be submitted to the Department of Regional Planning for approval.

☐ As a condition of ( ) final approval ( ) the grant ( ) approval of the zoning ordinance, and as a means of mitigating potential environmental impacts, a warning note shall ( ) be placed in the CC&Rs ( ) recorded on the title, indicating that the area has a limited groundwater supply during periods of severe drought. A copy of the ( ) CC&Rs shall be submitted to the Department of Regional Planning for approval and subsequently recorded with the final map ( ) title shall be submitted to the Department of Regional Planning for approval.

☐ Prior to recordation of the final map, the subdivider shall be required to enter into an agreement with the County to pay to the County a sum not to exceed $3,500.00 per residential unit, and not to be less than $2,000.00 per residential unit for the purpose of contributing to the proposed Road Benefit District prior to occupancy or upon demand of payment by the County Road Commission. Security for the performance of said agreement shall be guaranteed by the filing of a bond by a duly authorized surety.

☐ Prior to scheduling for public hearing, and as a means of mitigating any environmental impacts associated with the distance of the project to the nearest fire station, the applicant shall agree to comply with recommendations of the County Forester and Fire Warden.

☐ ____

☐ See attached pages for additional Project/Changes/Conditions

ENVIRONMENTAL ANALYSIS

1.0 Hazard Factors

1.1 Geotechnical

SETTING/IMPACTS:

	Y	N	
a.	☑	☐	Is the project site located in an active or potentially active fault zone? POTENTIALLY ACTIVE FAULT / SEVERE INTENSITY
b.	☐	☑	Is the project site located in an area containing a major landslide(s)?
c.	☑	☐	Is the project site located in an area having high slope instability? MAJOR FAULT ZONE : MODERATELY UNSTABLE TO UNSTABLE
d.	☐	☑	Is the project site subject to high subsidence, high groundwater level, or hydrocompaction?
e.	☑	☐	Is the proposed project considered a sensitive use (school, hospital, public assembly site) located in close proximity to a significant geotechnical hazard?
f.	☑	☐	Other factors? HILLSIDE MANAGEMENT AREA

MITIGATION MEASURES:

Standard mitigation measures are: ☐ Building Ordinance No. 2225--Sections 308B, 309, 310 and 311 and Chapters 29 and 70.

Other considerations: ☐ Lot Size ☐ Project Design

CONCLUSION:

Considering the above information, could the project have a significant impact on, or be impacted by, geotechnical factors?

☑ Yes ☐ No

1.2 Flood

SETTING/IMPACTS:

	Y	N	
a.	[x]	[ ]	Is a major drainage course, as identified on USGS quad sheets by a dashed line, located on the project site? APPROX. 10 BLUELINE STREAMBEDS
b.	[ ]	[x]	Is the project site located within or does it contain a floodway or floodplain?
c.	[ ]	[ ]	Is the project site located in or subject to high mudflow conditions? UNKNOWN.
d.	[x]	[ ]	Will the project contribute, or be subject to, high erosion and debris deposition from run-off? VERY HIGH
e.	[ ]	[x]	Other factors?

MITIGATION MEASURES:

Standard mitigation measures are:

- [ ] Building Ordinance No. 2225--Section 308A
- [ ] Flood Control District Drainage Concept
- [ ] Ordinance No. 12,114 (Floodways)

Other considerations: [ ] Lot Size [ ] Project Design

FISH & GAME CONDITION

CONCLUSION:

Considering the above information, could the project have a significant impact on, or be impacted by, flood (hydrological) factors?

[x] Yes [ ] No

1.3 Fire

SETTING/IMPACTS

	Y	N	
a.	☑	☐	Is the project site located in a high fire hazard area (Fire Zone 4) or Quinton/Redgate fire classification)?
b.	☐	☑	Is the project site in a high fire hazard area and served by inadequate access due to length, width, surface material, turnarounds, or grade?
c.	☐	☑	Is the project site in a high fire hazard area and has more than 75 dwelling units on a single access?
d.	☐	☑	Is the project site located in an area having inadequate water and pressure to meet fire flow standards?
e.	☐	☑	Is the project site located in close proximity to potential dangerous fire hazard conditions/uses (such as refineries, flammables, explosives manufacturing)?
f.	☐	☑	Does the proposed use constitute a potentially dangerous fire hazard condition/use?
g.	☐	☑	Other Factors?

MITIGATION MEASURES:

Standard mitigation measures are: ☐ Fire Ordinance No. 2947

☐ Water Ordinance No. 7834 ☐ Fire Prevention Manual Regulation No. 12

Other considerations: ☐ Project Design

CONCLUSION:

Considering the above information, could the project have a significant impact on, or be impacted by, fire hazard factors?

☑ Yes ☐ No

1.4 Noise

SETTING/IMPACT:

	Y	N	
a.	☐	☑	Is the project site located near a high noise source (airports, railroads, freeways, industry)?
b.	☑	☐	Will the project substantially increase ambient noise levels, including those associated with special equipment (such as air conditioning units) or parking areas associated with the project?
c.	☐	☑	Is the proposed use considered sensitive (school, hospital, senior citizen facility)?
d.	☐	☑	Other factors?

MITIGATION MEASURES:

Standard mitigation measures are: ☐ Building Ordinance No. 2225--Chapter 35

☐ Noise Ordinance No. 11,778

Other considerations: ☐ Lot Size ☐ Project Design

☐ Compatible Use

CONCLUSIONS:

Considering the above information, could the project have a significant impact on, or be adversely impacted by, noise?

☑ Yes ☐ No

2.0 Natural Resources

2.1 Water Quality

SETTING/IMPACT:

a. Y [x] N [ ] Will the proposed project require the use of a private sewage disposal system?
SEPTIC TANK " PORTABLE TOILETS

[x] [ ] If the answer is yes, is the project site located in an area having known septic tank limitations due to high groundwater or other geotechnical limitations?
SEVERE SEPTIC LIMITATIONS

[x] [ ] Is the project proposing on-site systems located in close proximity to a drainage course?

b. [ ] [ ] Will the proposed project place industrial waste (corrosive or toxic materials) into a private sewage disposal system or a community system?
UNKNOWN

c. [ ] [x] Is the project site located in an area having known water quality problems and proposing the use of individual water wells?

d. [ ] [x] Other factors?

MITIGATION MEASURES:

Standard mitigation measures are:

[ ] Plumbing Code--Ordinance No. 2269

[ ] Health Ordinance No. 7583--Chapter 5

[ ] Industrial Waste Permit

Other considerations: [ ] Lot Size [ ] Lot Design

CONCLUSIONS:

Considering the above information, could the project have a significant impact on, or be impacted by, water quality problems?

[x] Yes [ ] No

2.2 Air Quality

SETTING/IMPACT:

	Y	N	
a.	☑	☐	Will the proposed project exceed the State's criteria for regional significance (generally (a) 500 dwelling units for residential uses or (b) 40 gross acres, 650,000 square feet of floor area, or 1,000 employees non-residential uses)?
b.	☐	☑	Is the proposal considered a sensitive use (schools, hospitals, parks) and located near a freeway or heavy industrial use?
c.	☑	☐	Will the project increase local emissions to a significant extent due to increased traffic congestion or use of a parking structure?
d.	☑	☐	Will the project generate or is the site in close proximity to sources which create obnoxious odors and/or hazardous emissions? METHANE GAS ODORS
e.	☐	☐	Other factors:

MITIGATION MEASURES:

Standard mitigation measures are: ☐ Health and Safety Code, Section 40506

Other considerations: ☐ Project Design ☐ Air Quality Management Plan

CONCLUSIONS:

Considering the above information, could the project have a significant impact on, or be impacted by, air quality?

☑ Yes ☐ No

2.3 Biota

SETTING/IMPACTS

a. ☐ ☑ Is the project site located within a Significant Ecological Area or Significal Ecological Area Buffer?

b. ☑ ☐ Does the project site contain a major riparian habitat?

c. ☑ ☐ Does the project site contain oak or other unique native trees?

d. ☐ ☑ Other factors?

MITIGATION MEASURES:

Other considerations: ☐ Lot Size ☐ Project Design

☐ Oak Tree Permit

OAK TREE REPORT OR LETTER STATING THAT NO OAK TREES WILL BE REMOVED

CONCLUSIONS:

Considering the above information, could the project have a significant impact on biotic resources?

☑ Yes ☐ No

3.0 Cultural Resources/Visual

3.1 Archaeological/Historical/Paleontological

SETTING/IMPACTS

	Y	N	
a.	☑	☐	Is the project site in or near an area containing known archaeological resources or containing features (drainage course) spring, knoll, rock out-croppings, or (oak trees) which indicate potential archaeological sensitivity?
b.	☐	☑	Does the project site contain rock formations indicating potential paleontological resources?
c.	☐	☑	Does the project site contain known historic structures or sites?
d.	☐	☑	Other factors?

MITIGATION MEASURES:

Other considerations: ☐ Lot Size ☐ Project Design

CONCLUSIONS:

Considering the above information, could the project have a significant impact on archaeological, historical, or paleontological resources?

☑ Yes ☐ No

.2 Visual Qualities

SETTING/IMPACTS:

	Y	N	
a.	☑	☐	Is the project site substantially visible from or will it obstruct views along a scenic highway (as shown on the Scenic Highway Element) or located within a scenic corridor? MAY BE VISIBLE FROM THE ANTELOPE VAL. FWY.
b.	☑	☐	Is the project substantially visible from or will it obstruct views from a regional riding or hiking trail? RIM OF THE VALLEY TRAIL.
c.	☐	☑	Is the project site located in an undeveloped or undisturbed area which contains unique aesthetic features?
d.	☐	☑	Is the proposed use out-of-character in comparison to adjacent uses because of height, bulk, or other features?
e.	☐	☑	Will the project obstruct unique views from surrounding residential uses?
f.	☐	☑	Will the project create substantial sun shadow or glare problems?
g.	☐	☑	Other factors: ______

MITIGATION MEASURES

Other considerations: ☐ Lot Size ☐ Lot Design ☐ Compatible Use

______

CONCLUSIONS:

Considering the above information, could the project have a significant impact on scenic qualities.

☑ Yes ☐ No

4.0 Services

4.1 Traffic/Access

SETTING/IMPACTS:

	Y	N	
a.	☐	☑	Does the project contain 25 dwelling units, or more and located in an area with known congestion problems (mid-block or intersections)?
b.	☐	☑	Will the project result in any hazardous traffic conditions?
c.	☐	☑	Will the project result in parking problems with a subsequent impact on traffic?
d.	☐	☑	During an emergency (other than fire hazards), will inadequate access result in problems for emergency vehicles or residents/employees in the area?
e.	☑	☐	Other factors? TRIP GENERATION IMPACT

MITIGATION MEASURES:

Other considerations: ☐ Project Design

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to traffic/access?

☑ Yes ☐ No

4.2 Sewage Disposal

SETTING/IMPACTS:

	Y	N	
a.	☑	☐	If served by a community sewage system, are there any known capacity problems at the treatment plant?
b.	☑	☐	Are there any known capacity problems in the sewer lines serving the project site?
c.	☑	☐	Other factors? ______

MITIGATION MEASURES:

Standard mitigation measures are:

☐ Plumbing Code--Ordinance No. 2269

☐ Sanitary Sewers and Industrial Waste Ordinance No. 6130

Other considerations: ______

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to sewage disposal facilities?

☐ Yes ☑ No

4.3 Education

SETTING/IMPACTS:

	Y	N	
a.	☐	☐	Are there known capacity problems at the district level? N/A
b.	☐	☐	Are there known capacity problems at individual schools which will serve the project site? N/A
c.	☐	☑	Are there any known student transportation problems?
d.	☐	☑	Other factors?

MITIGATION MEASURES:

Other considerations: ☐ SB 201 Funds ☐ Site Dedication

PROJECT IS A WASTE LANDFILL – WILL NOT IMPACT SCHOOLS

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to educational facilities/services?

☐ Yes ☑ No

4.4 Fire/Sheriff Services

SETTING/IMPACTS:

	Y	N	
a.	☐	☑	Are there any known staffing or response time problems at the fire station or sheriff's substation serving the project site?
b.	☐	☑	Are there any special fire or law enforcement problems associated with the project or the general area?
c.	☐	☑	Other factors?

MITIGATION MEASURES:

Other considerations:

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to fire/sheriff services?

☐ Yes ☑ No

4.5 Utilities/Other Services

SETTING/IMPACTS:

	Y	N	
a.	[ ]	[x]	Is the project site in an area known to have an inadequate water supply to meet domestic needs?
b.	[ ]	[x]	Is the project site in an area known to have an inadequate water supply and/or pressure to meet fire fighting needs?
c.	[ ]	[x]	Are there any known problems with providing other utility services, such as electricity, gas, propane?
d.	[ ]	[x]	Are there any known service problem areas?
e.	[x]	[ ]	Other factors? possible major water consumption, possible cumulative impact

MITIGATION MEASURES:

Standard mitigation measures are:

- [ ] Plumbing Code (Ordinance No. 2269)
- [ ] Water Ordinance No. 7834

Other considerations: [ ] Lot Size [ ] Project Design

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to utilities/services?

[x] Yes [ ] No

5.0 Other Factors

5.1 General Factors

SETTING/IMPACTS:

	Y	N	
a.	☐	☑	Will the project result in an inefficient use of energy resources?
b.	☑	☐	Will the project result in a major change in the pattern, scale, or character of the general area or community?
c.	☑	☐	Will the project result in a significant increase in light and/or glare?
d.	☑	☐	Will the project result in a significant reduction in the amount of agricultural land?
e.	☑	☐	Other factors? ODOR / LANDFILL GAS

MITIGATION MEASURES:

Standard mitigation measures are:

☐ State Administrative Code, Title 24, Part 5, T-20 (Energy Conservation)

Other considerations: ☐ Lot Size ☐ Project Design ☐ Compatible Use

CONCLUSION:

Considering the above information, could the project have a significant impact on the physical environment due to ____________?

☑ Yes ☐ No

United States Department of Agriculture

Forest Service

Angeles National Forest

701 North Santa Anita Avenue
Arcadia, CA 91006

Reply to: 1990
(Your: 88573)

Date: January 13, 1989

Frank Kuo, Supervising Regional Planner
Impact Analysis Section
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Dear Mr. Kuo:

We welcomed your Notice of Preparation of a Environmental Impact Report for conditional use permit for construction and operation of municipal non-hazardous waste landfill and appurtentent support facilities.

The Elsmere Canyon site is partially located on the Angeles National Forest. The Forest Service is already working with Elsmere Corporation on the required environmental and public review process for a possible transfer of National Forest System lands in upper Elsmere Canyon for privately held lands of equal or greater value.

The Angeles National Forest Land and Resources Management Plan (LMP) identifies the conditions whereby such an exchange may occur. A copy of the LMP is enclosed for your reference ([illegible]ly page 4-37)

We would be pleased to participate in your study to the extent you believe it would be appropriate and helpful. Richard Borden of my staff will be available to assist you. He may be reached at (818) 574-5255.

Sincerely,

For GEORGE A. ROBY
Forest Supervisor

Enclosure

DATE: Jan 13, 1989

TO: County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

FROM: Angeles National Forest
701 N. Santa Anita Ave.
Arcadia, CA 91006
ATTN: Charles McDonald

Attention: Impact Analysis Section
JULIE COOK

SUBJECT: ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above-mentioned project qualifies for/requires the following type of environmental document:

☐ Negative Declaration

☐ Negative Declaration with the following changes to the project:

____

____

____

☐ Environmental Impact Report (EIR) addressing our specific concerns. Our agency feels that there is substantial evidence that the project may have a significant effect on the environment (after considering appropriate mitigation measures). The scope and content of the environmental information required for full evaluation in an evaluation in an EIR is as follows:

____

____

____

____

The contact person for our agency is: Richard Borden, telephone number: (818) 574-5255.

COUNTY OF LOS ANGELES

DEPARTMENT OF PARKS AND RECREATION

433 South Vermont Avenue - Los Angeles, California 90020-1975 - (213) 738-2956

James I. Okimoto . . . Acting Director

January 27, 1989

Ms. Julie Cook
County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Attention: Impact Analysis Section

Dear Ms. Cook:

ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above named document has been reviewed by our Department. Our main concern focuses on any potential [redacted] impacts created by the proposed landfill.

A study is underway on the Whitney Canyon OHV Park, which is studying off-highway vehicle use of the adjacent property and an alternative means of access to the National Forest area. We consider this a potential compatible use with the proposed landfill.

One possible access to the National Forest is the existing road along the northeast boundary of the property proposed for the landfill. Also, an equestrian staging area and trail that was part of the Whitney Canyon OHV Park has been proposed to the developer but not developed. The developers have indicated their willingness to work with Parks and Recreation to implement that facility, which may also have an impact related to this project. In addition, there may be visual impacts on the Rim of the Valley Trail from this project.

The Department appreciates the opportunity to review this project. If you have any questions about these comments, please contact me at (213) 738-2964.

Sincerely,

Wendy A. Murphy

Wendy Murphy
Park Planning Assistant

PARKS ARE FOR PEOPLE

tls/jan89

DATE: January 26, 1989

TO: County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

FROM: L.A. County Parks & Recs.
433 S. Vermont Av., 4th Fl.
Los Angeles, CA 90010
ATTN: Jim Park

Attention: Impact Analysis Section
JULIE COOK

SUBJECT: ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above-mentioned project qualifies for/requires the following type of environmental document:

[ ] Negative Declaration

[ ] Negative Declaration with the following changes to the project:

____

____

____

[X] Environmental Impact Report (EIR) addressing our specific concerns. Our agency feels that there is substantial evidence that the project may have a significant effect on the environment (after considering appropriate mitigation measures). The scope and content of the environmental information required for full evaluation in an evaluation in an EIR is as follows:

see attached letter

The contact person for our agency is: Wendy Murphy, telephone number: 213-738-2964.

STATE OF CALIFORNIA—BUSINESS AND TRANSPORTATION AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, 120 SO. SPRING ST.
LOS ANGELES, CA 90012
TDD (213) 620-3550

L.A. COUNTY
[illegible] OCT 20 PM 12:30
DEPARTMENT OF
REGIONAL PLANNING

ENV.

(213) 620-2376

October 18, 1989

NOP - DEIR
Project No. 88573
Los Angeles County
Old San Fernando Road
and Hwy 14
Waste Landfill
Vic. LA-14-R27.05
SCH No. 89010017

Ms. Julie Cook
Los Angeles County Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Cook:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. Items which should be covered for the project include, but are not limited to:

A. Trip generation/distribution including the method used to develop the percentages and assignment.

B. [illegible], AM and PM peak-hour volumes for both the existing and future conditions. This should also include the Route 14 (Antelope Valley) Freeway and its interchange with San Fernando Road.

C. An analysis of future conditions which include project traffic and the cumulative traffic generated for all [illegible] in the area.

D. Any mitigation proposed should be fully discussed in the document. These discussions should include, but not be limited to, the following:

* financing
* scheduling considerations
* implementation responsibilities
* monitoring

We look forward to reviewing the DEIR. We expect to receive a copy from the State Clearinghouse. However, to expedite the review process, you may send two copies in advance to the undersigned at the following address:

Gary McSweeney
District 7 IGR/CEQA Coordinator
Transportation Planning & Analysis Branch
120 So. Spring Street
Los Angeles, CA 90012

Thank you for this opportunity to comment. If you have any questions regarding these comments, contact me at (213) 620-2376.

Sincerely,

GARY McSWEENEY
IGR/CEQA Coordinator
Transportation Planning & Analysis Branch

cc: State Clearinghouse

MR. GARRETT ASHLEY
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

November 2, 1989

IGR/CEQA
NEG DEC
½ mile to Peaceful
Valley Road
Project #89477
Vic. LA-14-R58.17

GARY McSWEENEY - District 7

Project Review Comments

SCH No. 89082306

Caltrans has reviewed the above-referenced document. Based on the information received we find no apparent impact on the State transportation system.

If you have any questions regarding this response, please call me at (ATSS) 8-640-2376 or (213) 620-2376.

GARY McSWEENEY
IGR/CEQA Coordinator
Transportation Planning and
Analysis Branch

cc: Ms. Julie Cook, County of Los Angeles

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
LOS ANGELES REGION
107 SOUTH BROADWAY, SUITE 4027
LOS ANGELES, CALIFORNIA 90012-4596
(213) 620-4460

February 3, 1989

File : 700.306

Julie Cook, R.P.A. II
County of Los Angeles
Department of Regional Planning
Impact Analysis Section
320 West Temple Street
Los Angeles, CA 90012

NOTICE OF CONSULTATION OF A DRAFT EIR TO CONSTRUCT AND OPERATE A MUNICIPAL/NONHAZARDOUS WASTE LANDFILL AND APPURTENANT SUPPORT FACILITIES AT THE INTERSECTION OF OLD SAN FERNANDO ROAD AND HIGHWAY 14, PROJECT NO. 88573: PLACERITA CANYON

We have reviewed the subject document regarding the proposed project, and have the following comments:

Based on the information provided, we recommend the following:

- [ ] We have no further comments at this time.
- [x] The proposed project should address the attached comments.
- [ ] Negative Declaration. See attached comments.
- [ ] Mitigated Negative Declaration. See attached comments.
- [x] EIR. See attached information on scope and content.

In addition to the attached comments, the Draft EIR must discuss and contain mitigation measures that will prevent potential water quality impacts from occurring in the major streambeds located adjacent to (i.e., Placerita Creek) and on the project site. The existing beneficial uses of these streambeds must also be protected from any potential water quality impacts resulting from the proposed project.

The Draft EIR must contain a geologic assessment of the site including depth to bedrock, type of bedrock (fractured, impermeable, etc.), type and depth of soil (including structure and permeability), depth to ground water, and annual precipitation. The location and age of all known faults within the area must also be included in the Draft EIR.

Thank you for this opportunity to review your document. If you have any questions, please contact Arthur Heath at (213) 620-5433.

ANNE SAFFELL
Environmental Specialist IV

cc: Mr. Keith Lee, State Clearinghouse

Attachment(s): EIR, ST, SE

1. The Draft EIR must include the following:

- [x] a. Description of the proposed project.

- [x] b. Description of the present environmental setting of the project site.

- [ ] c. An estimate of the quantities of wastewaters to be contributed to the sanitary sewer system and the treatment plant that will serve the proposed development. The DEIR must demonstrate that the sanitary sewer system will have adequate capacity to collect, transport, treat and dispose of the additional flow in a satisfactory manner.

- [ ] d. An analysis of the cumulative flows generated by all proposed, pending and approved projects within the service area of the designated treatment plant. If expansion of the treatment plant facilities will be required to meet projected wastewater demand, the DEIR must demonstrate that additional capacity will be available prior to new connections for proposed development.

- [x] e. Description of the quantity, quality, and location of discharges other than to the sanitary sewer system. The impacts of these discharges on groundwater and receiving water quality must be discussed.

1. Septic Tank Concerns:

The Regional Board generally opposes the use of septic tanks unless other reasonable options are not available or viable. In the absence of a sewer system, we support the formation of a public on-site wastewater management entity to operate and maintain the septic systems. Furthermore, septic systems must conform to all applicable rules and regulations of the local health department.

- [x] a. The project is located in an area known to have septic tank limitations. These limitations (slope, depth to ground water, percolation rate and a mandatory 100% replacement area for the leaching system) should be considered when demonstrating that private sewage disposal systems can be installed and operated properly on each lot. These limitations should be in conformance with all applicable rules and regulations of the local health department.

- [x] b. Septic tanks must have adequate lot size, and must be installed and operated properly.

- [x] c. Identify the type(s) of waste(s) to be discharged.

- [x] d. Specify the quantity of waste(s) to be discharged.

- [ ] e. The installation and operation of septic tanks for the proposed project would be subject to Waste Discharge Requirements issued by the Los Angeles Regional Water Quality Control Board. A permit application should be submitted to this office at least 120 days prior to the projected opening of this facility.

1. Septic Tank Concerns (cont.):

☐ f. The project is located in an area known to have severe septic tank limitations. Therefore, a report of septic tank plans which addresses the following concerns must be submitted to this Regional Board before your planning agency grants approval for construction:

1. The number and location of current and proposed water supply wells in the vicinity of the project.

2. The existing ground water quality and depth to ground water.

3. A geologic assessment of the site including depth to bedrock, type of bedrock (fractured, impermeable, etc.), type and depth of soil, and the results of percolation tests run on each lot.

4. The quantity of sewage expected to be generated by the project.

5. The impact of the completed project on the quality of the ground water in the area, both individually and considering the cumulative effects of present and proposed projects in the vicinity.

6. The provisions which will be made to connect the project to a possible future community sewer system.

☑ g. If this is an area where rapid development is expected to occur, we recommend that dry sewers be installed so that connections can easily be made to a community sewer system when it becomes available.

1. **Soil Erosion Concerns:**

☑ a. Every precaution should be taken to prevent water quality impacts resulting from soil erosion and increased surface runoff, especially during grading and construction activities.

☑ b. Adequate storm drainage facilities should be made available to minimize soil erosion.

☑ c. Based on the information provided, the project site is an area potentially subject to high erosion and high mud flow conditions. In addition, the site is located in an area having moderately high slope instability. Development of the site may result in additional impermeable surfaces, which could increase the volume and intensity of storm water runoff and accelerate soil erosion. Therefore, the project should include mitigation measures that will minimize the water quality impacts surrounding the site.

COUNTY OF LOS ANGELES • DEPARTMENT OF HEALTH SERVICES

313 NORTH FIGUEROA STREET • LOS ANGELES, CALIFORNIA 90012 • (213) 974-

Refer reply to: 2615 S. Grand Ave. Rm. 450
Los Angeles, Ca 90007
(213) 744-3251

January 23, 1989

Frank Kuo, AICP
Impact Analysis Section
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Dear Mr. Kuo:

RE: NOTICE OF CONSULTATION - PROJECT NO. 88573

This Department has reviewed the environmental information submitted with the notice of consultation regarding the conditional use permit for the construction and operation of municipal/non-hazardous waste landfill and appurtenant support facilities at the intersection of Old San Fernando Road and Highway 14.

We believe that the project requires the preparation of an environmental impact report and the scope and content of the EIR should include:

- A complete discussion of landfill gas collection and migration control system, including method for collection, treatment and disposal of gas condensate.

- A complete description of the geology of the site with particular emphasis on potential active faults. Current regulation (Title 23 California Code of Regulations, Chapter 3, Subchapter 15) prohibits the location of new non-hazardous waste landfills on known Holocene faults. This description must also address the impact on ground water in the area.

- A complete description of liner and leachate collection and recovery system to be provided in the landfill.

- A complete discussion of the possibility of accepting sewage sludge for disposal.

- A complete description of total design capacity of the facility and how the total capacity will be utilized (phased, step-wise or all-at-once).

- The source and availability of cover material.

- The number and types of equipment to be used in landfill operations.

This will include standby equipment also.

- [redacted] discussion of the impact of the project, the project's benefits and, the impact of the project upon [redacted] Canyon and Chiquita Canyon landfills.

- A discussion of any recycling or resource recovery activities that will be part of the routine daily operation of the landfill.

- A discussion of plans for closure and post-closure maintenance of the facility as well as source(s) of funding for those activities. Preliminary closure and post-closure plans are required to be submitted with the application for the facility permit.

- A discussion of method(s) for preventing acceptance of household hazardous wastes, small volumes of hazardous wastes and efforts to illegally dispose of hazardous wastes at the landfill. This should include a plan for isolating and properly disposing of any hazardous wastes found during checking waste loads. The facility permit will require the operator to implement a daily random waste load checking program as part of an effort to prevent disposal of hazardous waste.

- A discussion of the source of potable water and the disposal of sewage on the proposed site.

Applicant is [redacted] the services of an independent engineering or consulting firm to evaluate and assess the activities involving mitigation measures, e.g., installation of liners, gas control systems, etc., to assure they are completed as designed and required.

This Department (LEA) will prepare and issue the State Solid Waste Facilities Permit. The applicant/operator must complete environmental review, land use approval, obtain Waste Discharge Requirements from the California Regional Water Quality Control Board, receive Finding of Conformance with the Los Angeles County Solid Waste Management Plan and submit an application to LEA for operating permit. This application must include an acceptable Report of Disposal Site Information and Engineering Report.

If you have any questions or wish additional information, please contact Chuck Coffee, [redacted] Solid Waste Management Program at 213-744-3261. *

Very truly yours,

Jack Petralia, Director
Bureau of Environmental Protection

JP:
wp:eir-88573

L.A. COUNTY

1989 JAN 11 AM 10:30

DEPARTMENT OF
REGIONAL PLANNING

DATE:

TO: County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

FROM: L.A. County Health Svcs.
313 N. Figueora St.
Los Angeles, CA 90002
ATTN: Frank Gomez-Noise

Attention: Impact Analysis Section
JULIE COOK

SUBJECT: ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above-mentioned project qualifies for/requires the following type of environmental document:

☐ Negative Declaration

☐ Negative Declaration with the following changes to the project:

___

___

___

☑ Environmental Impact Report (EIR) addressing our specific concerns. Our agency feels that there is substantial evidence that the project may have a significant effect on the environment (after considering appropriate mitigation measures). The scope and content of the environmental information required for full evaluation in an evaluation in an EIR is as follows:

(1) NOISE ANALYSIS IS REQUIRED.

___

___

(2) ___

The contact person for our agency is: DR. FRANK GOMEZ,
telephone number: 974-7841.

5.2 Environmental Safety -

SETTING/IMPACTS:

	Y	N	
a.	☑	☐	Are any hazardous materials used, produced, or stored on-site?
b.	☐	☑	Are any hazardous wastes stored on-site?
c.	☑	☐	Are any pressurized tanks to be used on-site?
d.	☐	☑	Are any residential units, schools, or hospitals located within 500 feet?
e.	☑	☐	Other factors? HAZARDOUS MATERIAL

MITIGATION MEASURES:

CONSULTATION WITH COUNTY HEALTH DEPT.

CONCLUSION:

Considering the above information, could the project have a significant impact on public safety?

☑ Yes ☐ No

COUNTY OF LOS ANGELES

FIRE DEPARTMENT

1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063
(213) 267-2481

ENT ✓

L.A. COUNTY

P. MICHAEL FREEMAN
FIRE CHIEF
FORESTER & FIRE WARDEN

October 5, 1989

Julie Cook, RPA II
Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Dear Ms. Cook:

SUBJECT: OAK TREE PERMIT CASE #88-573 — ELSMERE CANYON LANDFILL

This Oak Tree Report was reviewed by this office and found to be incomplete. Please furnish the following information:

1. Unless the tree survey is 100% cruise, The method of cruise and the percent must be approved by the Director of Regional Planning and Los Angeles County Forestry, to determine an accurate tree estimate (Sec. 4-22.56.2090, Par. E-h-i).

2. The applicant's oak trees must have permanent identification tags attached to them that correspond to a numbered plan map and the Oak Tree Report (Sec. 4-22.56.2090, Par. E-i).

3. An oak tree map with each tree or approved survey tree located and identified on the map by number (Sec. 4-22.56.2090, Par. E-i).

4. The Oak Tree Report needs to include a chart containing each oak tree or surveyed oak tree's species, size, condition, and proposed disposition (Sec. 4-22.56.2090, Par. F-b, c, d, e, f).

As soon as additional information is received, our Department will complete its review. It there are any questions, please contact this office at the phone number shown above.

Very truly yours,

P. MICHAEL FREEMAN

BY

JOSEPH FERRARA
HEAD DEPUTY FORESTER
FORESTRY DIVISION

JF:lc

SERVING THE UNINCORPORATED AREAS OF LOS ANGELES COUNTY AND THE CITIES OF:

BRADBURY
CARSON
CERRITOS
CLAREMONT
COMMERCE
CUDAHY
DUARTE
GLENDORA
HAWAIIAN GARDENS
HIDDEN HILLS
HUNTINGTON PARK
INDUSTRY
LA CANADA FLINTRIDGE
LAKEWOOD
LA MIRADA
LANCASTER
LA PUENTE
MAYWOOD
NORWALK
PALMDALE
PALOS VERDES ESTATES
PARAMOUNT
ROLLING HILLS
ROLLING HILLS ESTATES
ROSEMEAD
SAN DIMAS
SOUTH GATE
TEMPLE CITY
WALNUT
WEST HOLLYWOOD

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF FISH AND GAME
330 Golden Shore, Suite 50
Long Beach, CA 90802
(213) 590-5113

L.A. COUNTY

January 13, 1989

Frank Kuo, AICP
Impact Analysis Section
Department of Regional Planning
County of Los Angeles
320 W. Temple Street
Los Angeles, CA 90012

Dear Mr. Kuo:

We have reviewed the Notice of Consultation for Project No. 88573. To enable our staff to adequately review and comment on this project, we recommend the following information be included in the Draft EIR:

1) A complete assessment of flora and fauna within the project area. Particular emphasis should be placed upon identifying endangered, threatened, and locally unique species; 2) documentation of direct, indirect, and cumulative impacts expected to adversely affect biological resources within and adjacent to the project site; 3) mitigation measures proposed to offset such impacts; and 4) assessment of growth-inducement factors potentially affecting natural open space and biological resources. Set aside natural open space in sufficient acreage to provide habitat for native wildlife and include landscape programs, with native trees and shrubs, to provide habitat for wildlife.

Diversion or obstruction or changes in the bed, channel, or bank of any river, stream, or lake will require notification to the Department of Fish and Game as called for in the Fish and Game Code. This notification (with fee) and the subsequent agreement must be completed prior to initiating any such changes. Notification should be made after the project is approved by the lead agency.

Thank you for the opportunity to review and comment on this project. If you have any questions, please contact Jack L. Spruill of our Environmental Services staff at (213) 590-5137.

Sincerely,

Fred Worthley
Regional Manager
Region 5

cc: Office of Planning & Research

FILE COPY

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF FOOD AND AGRICULTURE
1220 N Street
Sacramento, CA 95814

November 1, 1989

Julie Cook
Los Angeles County Regional Planning
320 West Temple Street
Los Angeles, California 90012

Dear Ms. Cook,

Thank you for the opportunity to comment on the forthcoming Draft Environmental Impact Report (DEIR) for Project No. 88573, (SCH# 89010017).

The California Department of Food and Agriculture (CDFA) has no comment at this time but would appreciate the opportunity to review the completed DEIR.

The lead agency should also solicit comments from concerned local agencies such as the agricultural commissioner's office, the USDA Soil Conservation Service office, and the county Farm Bureau Federation office, for potential project impacts.

The CDFA supports the right of local agencies to develop and implement land-use policy in its area of influence, but also wants to assure that agricultural land is not prematurely and irreversibly lost due to development which is not accurately assessed for environmental impact.

Sincerely,

Donna McIntosh

Donna McIntosh
Graduate Student Assistant
Agricultural Resources Branch
(916) 322-5227

cc: Garrett Ashely
Los Angeles County Agricultural Commissioner
California Association of Resource Conservation Districts

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE ENHANCEMENT FIELD STATION
Federal Building, 24000 Avila Road
Laguna Niguel, California 92656

In Reply Refer To:
FWS/FWEFS

November 14, 1989

Ms. Julie Cook
Impact Analysis Section
County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Dear Ms. Cook:

This letter addresses the Notice of Preparation (Notice) of an Environmental Impact Report (Report) for the Elsmere Canyon Landfill, Project No. 88573, Santa Clarita, Los Angeles County, California. The U.S. Fish and Wildlife Service (Service) has reviewed the Notice and provides the following comments.

The primary concern of the Service is the protection of public fish and wildlife resources and their habitats. Our mandates require that we provide comments on any public notice issued for a Federal permit or license affecting the nation's waters, in particular, Corps permits pursuant to Section 404 of the Clean Water Act and Section 10 of the River and Harbor Act of 1899. The Service is also responsible for administering certain portions of the Endangered Species Act (Act) of 1973, as amended. Section 7 of the Act requires Federal agencies to consult with the Service should they determine that their actions may affect any listed threatened or endangered species. Section 9 of the Act prohibits the "taking" of any Federally listed endangered or threatened animal species. Taking includes harm which may include destruction of necessary habitat or disruption of nesting behavior.

Generally, the Service will require for analysis the following information:

1. A description of the proposed project, including all feasible alternatives. This alternative analysis is important to the Service's evaluation of the project as feasible alternatives often have less impacts to biological resources.

2. Specific acreages and detailed descriptions of the amount and types of habitats that may be affected by the proposed project.

Of particular concern will be the number of wetland and riparian acres on-site and downstream of the proposed project to be impacted. This number should be verified by the Corps and/or the Environmental Protection Agency. Maps and tables should be included in the draft Report to assist in evaluation of project-related impacts.

3. Quantitative and qualitative information concerning fish and wildlife resources associated with each habitat type.

4. A list of federal candidate, proposed or listed threatened or endangered species, state-listed species, and locally declining or sensitive species that are found at or near the project site. A detailed discussion of these species, focusing on their site-related distribution and abundance and the anticipated impacts of the project on these species should also be included.

5. An assessment of biological impacts, including direct, indirect and cumulative impacts. All aspects of the project, should be included in this assessment.

6. Specific mitigation plans to offset project-related impacts, including cumulative impacts of direct and indirect habitat losses. If necessary, adverse project-related impacts should be mitigated through the re-creation and/or revegetation of impacted habitat types. The objective of the mitigation plan should be to offset the qualitative and quantitative project induced loss of wildlife habitat values. Avoidance of the impacts through project modification is considered mitigation.

7. Identification of construction methods to be employed to prevent soil erosion, along with specific erosion and sedimentation control plans to be carried out throughout the life of the project.

8. A discussion concerning proposed open space and the continuation of that open space to existing and/or proposed adjacent open space to provide maximum wildlife use of the project site.

We look forward to reviewing your draft Environmental Impact Report. Should you have any additional questions, please contact [redacted] (714) 643-4270.

Sincerely,

Brooks Harper

Brooks Harper
Acting Field Supervisor

DATE: January 29, 1989

TO: County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Attention: Impact Analysis Section
J. COOK

FROM: ARMY CORPS, OF ENGR., L.A. DISTRICT,
Regulatory Branch
P.O. Box 2711
Los Angeles, CA 90053
ATTN: Liz Varnhagen
Environmental Engineer

SUBJECT: ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above-mentioned project qualifies for/requires the following type of environmental document:

☐ Negative Declaration

☐ Negative Declaration with the following changes to the project:

☒ Environmental Impact Report (EIR) addressing our specific concerns. Our agency feels that there is substantial evidence that the project may have a significant effect on the environment (after considering appropriate mitigation measures). The scope and content of the environmental information required for full evaluation in an evaluation in an EIR is as follows:

The applicant will need to consult with the Corps of Engineers to obtain a Section 404 permit for fill placed in any streambed found on the property. Early consultation is advised to evaluate project alternatives and propose adequate mitigation for any unavoidable adverse impacts ~~to these areas~~.

The contact person for our agency is: Liz Varnhagen,
telephone number: (213) 894-5606.

February 1, 1988

TO: N. C. Datwyler
Planning Division

FROM: Kenneth R. Kvammen
Waste Management Division (LA Co Public Works)

NOTICE OF CONSULTATION
ENVIRONMENTAL DOCUMENTATION - INITIAL STUDY
PROJECT NO. 88573 - ELSMERE CANYON LANDFILL

The subject report dated January 11, 1989, was transmitted to this office directly by the County Regional Planning Department (RPD). We have reviewed the subject report in reference to our area of responsibility and offer the following comments:

1. The County of Los Angeles is in the midst of a solid waste crisis. According to current estimates, Los Angeles County generates approximately 50,000 tpd of solid waste. Recent studies indicate that even with the implementation of recycling, composting, and other resource recovery options, a large amount of waste will still need to be disposed of at landfills. If no landfills are sited or expanded, the County will exhaust the disposal capacity of its existing landfills by mid 1993, and a landfill capacity shortage will occur by 1991. As such, the proposal will address the need for additional capacity.

2. The proposed facility is one of the six best landfill sites identified in the report entitled "Solid Waste Management Status and Disposal Options in Los Angeles County", dated February 1988. At this time, a Programmed Environmental Impact Report (PEIR) is under preparation for the sites. As such, the applicant should contact this office to ensure data consistency of the project's EIR and PEIR.

3. The proposed project will require a Finding of Conformance with the Los Angeles County Solid Waste Management Plan (CoSWMP).

4. The proponent should address provisions for the handling of hazardous wastes. While it is the intent of the facility to process only municipal/non-hazardous wastes, procedures for the identification, handling and disposal of hazardous wastes should be addressed. A load checking program is a condition for the issuance of a Finding of Conformance with the CoSWMP.

5. The proposed project, if implemented, will generate leachate and gas condensate. The proponent should address if they will be collected and treated on-site and, if so, how. If they are to be treated at an off-site facility, the proponent should address the need for an on-site storage capacity.

6. Environmental Analysis, General Factors Section 5.1(e)

   The proponent needs to address the issue of landfill gas migration into support facilities. Appurtenant support facilities should be protected against landfill gas migration in accordance with Section 308(c) of the Los Angeles County Building Code.

7. Environmental Analysis, Environmental Safety Section 5.2(e)

   If the proposed project will result in the installation of underground tanks for the storage of hazardous materials or the discharge of industrial waste to the sewer system and/or septic tank, this office must be contacted for issuance of the necessary permit(s).

Also attached is the evaluation sheet to be returned to Ms. Julie Cook of the RPD on the project.

MA:kt(ts3)/NOTICE

Attach.

L.A. COUNTY

DATE: February 2, 1989

TO: County of Los Angeles
Department of Regional Planning
320 West Temple Street
Los Angeles, California 90012

Attention: Impact Analysis Section
JULIE COOK

FROM: Public Works
Waste Mgmt. Div.

SUBJECT: ENVIRONMENTAL DOCUMENTATION
PROJECT 88573

The above-mentioned project qualifies for/requires the following type of environmental document:

[ ] Negative Declaration

[ ] Negative Declaration with the following changes to the project:

[X] Environmental Impact Report (EIR) addressing our specific concerns. Our agency feels that there is substantial evidence thet the project may have a significant effect on the environment (after considering appropriate mitigation measures). The scope and content of the environmental information required for full evaluation in an evaluation in an EIR is as follows:

(See attachment)

The contact person for our agency is: M. Michael Mohajer,
telephone number: (818) 458-3561.

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, Governor

CALIFORNIA WASTE MANAGEMENT BOARD
1020 NINTH STREET, SUITE 300
SACRAMENTO, CALIFORNIA 95814

NOV 16 1989

Ms. Julie Cook
Impact Analysis Section
Department of Regional Planning
County of Los Angeles
320 West Temple Street
Los Angeles, CA 90012

Subject: Notice of Preparation (NOP), Project No. 88573
Proposed Elsmere Canyon Landfill

Dear Ms. Cook:

In your Notice of Preparation you had requested that this Board provide input in terms of environmental impacts that could be created by the project (a new landfill) and the scope and content of an Environmental Impact Report (EIR).

All comments concerning the appropriate environmental document and potential impacts and mitigation measures of the project that were included in the attached March 3, 1989 letter previously sent to your office are still relevant. That letter with a Disposal EIR Checklist is attached for your information.

If you have any questions about the information provided, please call [redacted] Local [redacted] 327-0439. Mr. Smith will be the Board's contact Person for this environmental document.

Sincerely,

for John D. Smith

George H. Larson, Manager
Resource Conservation and
Local Planning Divisions

Enclosure

STATE OF CALIFORNIA | GEORGE DEUKMEJIAN, Governor

CALIFORNIA WASTE MANAGEMENT BOARD

1020 NINTH STREET, SUITE 300
SACRAMENTO, CALIFORNIA 95814

L.A. COUNTY

MAR 03 1989

Ms. Julie Cook
Impact Analysis Section
Department of Regional Planning
County of Los Angeles
320 West Temple Street
Los Angeles, CA 90012

Subject: Notice of Consultation, Project No. 88573 (Proposed Elsmere Canyon Landfill

Dear Ms. Cook:

In your Notice of Consultation you had requested that this Board provide input in terms of environmental impacts that could be created by the project (a new landfill) and the scope and content of an Environmental Impact Report (EIR), if it is required.

California Waste Management Board (CWMB) staff has carefully reviewed the notice and offers comments in three areas; type of environmental document, scope and content of environment document and the CWMB's regulatory authority over the project.

Appropriate Environmental Document

It would appears from the information provided in the Notice and the attached Initial Study that an EIR would be the most appropriate document for this project.

Scope and Content of EIR

To assist you in the preparation of the EIR staff has enclosed the following:

1. A "Disposal EIR Checklist

2. Two tables, one identifying potential environmental impacts which could be caused by the establishment and operation of various solid waste facilities, and another that describes mitigation measures for each impact.

3. A copy of the CWMB's Minimum Standards for Solid Waste Handling and Disposal

If you have any questions about the information provided, please call John D. Smith of the CWMB's Local Planning Division at (916) 327-0439. Mr. Smith will be the Board's contact person for this environmental document.

Sincerely,

George H. Larson, Manager
Resource Conservation and Local Planning Divisions

Enclosures

cc: Keith Lee
State Clearinghouse

CWMB Regulatory Responsibilities

Information on both CWMB and local requirements that must be met before the landfill can be established is provided below.

CWMB Actions

1. Determination of Conformance (Government Code section 66784)

   Before the landfill can be established (this includes construction), the CWMB must determine whether or not the proposed landfill conforms to the County Solid Waste Management Plan.

2. Solid Waste Facilities Permit (Government Code section 66796.41)

   Prior to the commencement of landfill operations at the site, the CWMB must concur in a Solid Waste Facilities Permit prepared by the Local Enforcement Agency.

Local Actions

1. Finding of consistency with the General Plan (Government Code section 66796.41)

   Before the CWMB can concur in a Solid Waste Facilities Permit, the local government, in whose jurisdiction the facility is located, must make a finding that the proposed facility is consistent with General Plan.

   Before this finding can be made, two conditions need to be met:

   a. the facility must be designated in the General Plan,

      and

   b. the adjacent land uses must be compatible with the site

2. Distance Finding (Government Code section 66784.2)

   This action requires that the local government, in whose jurisdiction the proposed landfill is to be located, makes a finding that the distance from the landfill to the nearest residential structures is sufficient to ensure compliance with the CWMB's State Minimum Standards prior to its establishment.

DISPOSAL SITE EIR CHECKLIST

I. GENERAL BACKGROUND INFORMATION

A. Project Location

B. Need for the Project

C. Area Served

D. Population Served

E. Population Projections

F. Existing Facilities

G. Conformance to County Solid Waste Management Plan

H. Regional Map

I. Designation in General Plan

II. PROJECT DESCRIPTION

A. Site Description

1. Topographic map showing site location

2. Size of the site (acres)

3. Site layout map (showing areas to be filled, sequence of filling, and property boundaries)

4. Total capacity of the site

5. Average quantity of waste to be received daily

6. Expected site life (years)

7. Current land use

8. Current zoning

9. All land use within 1000 feet of site boundaries -See Gov't Code Section 66784.2

10. Owner/operator of the Landfill

11. Classification of site (Class I, II, III etc.)

12. Classification of wastes to be received (Group 2, 3, etc.)

13. Ultimate end use of site

14. Maximum height of fill

15. Public and/or private use

16. Permits required by local and state agencies to implement the project - in sequence

B. Operations Description

1. Compliance with CWMB standards for handling and disposal (Title 14 CCR)

2. Method of disposal (area/trench/canyon)

   a) Construction of cells - height of cells, compaction

3. Depth of excavation

4. Maximum height of completed fill

5. Cover types - daily, intermediate

   a) Frequency of cover

   b) Thickness of cover

   c) Suitability of cover material

   d) Volume of cover material needed for the entire project

   e) Source and supply of cover - to end of site life

6. Anticipated waste compaction (lbs./cu. yd.)

7. Number & Job Titles of employees

8. Equipment - e.g. compactor, water truck, scraper, track dozer

9. Hours/days of operation - days/weeks of operation per year

10. Fire control provisions - on-site; nearest fire dept.

11. Vector control provisions - flies, rodents, birds, mosquitoes

12. Litter control provisions - fences, litter pick-up schedule

13. Traffic

    a) Access routes

    b) Present loading - project induced load

    c) On-site roads

14. Scales - number, weight limits, computerized recording

15. Odor control provisions

16. Dust control provisions

17. Record keeping

18. Erosion controls for wind, vehicular, run-on, run-off - e.g. berms, conduits, levees

19. Sedimentation controls - e.g. silt collection ponds

20. Landfill gas monitoring and quality assurance/quality control systems

21. Groundwater/Vadose zone monitoring sytems

22. Leachate controls

    a) Liner (if applicable)

        1. Permeability of liner (cm/sec)

        2. Sensitivity of line to acidic or caustic compounds

        3. Quality Assurance/Quality Control - installation

    b) Compaction of underlying soils

        1. Permeability achieved after compaction (cm/sec)

    c) Collection system

        1. Maximum gpm or gpd the system can handle: pumping, storage, disposal

    d) Recirculation

    e) Impermeable barriers

1. Permeability of barrier (cm/sec)

23. Leachate monitoring system

24. Description of storage or disposal areas for bulky items

25. Provisions for special wastes handled (e.g., liquids, sludge, etc.)

26. Resource recovery provisions - salvaging

27. Fencing and provisions for site security

28. Police protection

29. Drainage facilities and surface water routing

30. Flood protection facilities

31. Site improvements

    a) Water

    b) Bathroom and Shower

    c) Telephone

    d) Electricity and Gas

    e) Sewage disposal system - septic, sewer

C. Closure Procedures

1. Final cover

    a) Thickness

    b) Permeability (cm/sec)

    c) Grading

2. Revegetation

3. Responsibility for maintenance

4. Responsibility for monitoring

5. Length of maintenance

6. Closure/Post-closure maintenance fund

III. EXISTING ENVIRONMENT

A. Climate

1. Average precipitation

a) Seasonal

b) Annual

2. Seasonal temperaute range

3. Wind

a) Direction - seasonal

b) Velocity - seasonal

4. Evaporation rate

a) Seasonal

b) Annual

B. Air

1. Baseline air quality data

2. Existing vehicular emissions

a) Landfill equipment

b) Refuse vehicles

3. Projected vehicular emissions

a) Landfill equipment

b) Refuse vehicles

4. Evaporative emissions (from wastes disposed at site)

C. Surface Water

1. Existing surface waters (streams, rivers, etc.)

2. Drainage courses

3. Average seasonal flows

4. Greatest anticipated 24 hour or 6 day rainfall amount

5. Beneficial uses of waters - portable, agricultural, recreational

6. Water quality analysis - physical, organic, inorganic analyses

7. Watershed characteristics - sources, outflows

D. Subsurface Water

1. Existing subsurface water (aquifer, aquiclude, etc.)

2. Water quality analysis (from site specific tests)

3. Beneficial uses of waters

4. Location of private & public wells within 1 mile of site

5. Minimum depth of groundwater (from site specific tests) - seasonal

E. Geology

1. Description of subsurface strata (in place)

   a) Unified Soil Classification (CH, OH, etc.)

   b) Percent passing #200 sieve

   c) Liquid limit

   d) Plasticity index

   e) Underlying geologic formation - e.g. igneous, metamorphic, sedimentary

2. Permeability of soil (from field samples and not textbook figures)

3. Seismicity

   a) Faults underlying the site

   b) Estimate of seismic risk at the site (distance to nearest fault, maximum projected earthquake of the fault, etc.)

   c) Distance to nearest fault system

4. Boring logs (including boring locations)

5. Mineral deposits

F. Land

1. Descriptions of the site surface
2. Visibility from surrounding area
3. Maximum slopes on the site
4. Slope stability (recommended allowable cut)

G. Flora

1. Description of site flora
2. Vegetation which will require permanent removal
3. Relation between vegetation and slope stability and erodability
4. Rare and endangered flora

H. Fauna

1. Description of site fauna
2. Resident population of rodents and other vectors
3. Rare and endangered fauna

I. Noise

1. Background noise levels at and adjacent to the site
2. Location of noise receptors
3. Noise levels generated by landfill operation - peak and 8-hour maximum dB exposures in relation to OSHA regulations

J. Social

1. Growth inducement
2. Land use compatibility
   a) Zoning
   b) General plan compatibility
   c) Regional plan compatibility
   d) Adjacent land use

3. Aesthetics

a) Viewshed impact

K. Historic

1. Archaeological sites

2. Historical sites

IV. IMPACTS, MITIGATIONS, AND IRREVERSIBLE IMPACTS

A. Climate

B. Air

C. Surface Water

D. Subsurface Water

E. Geology

F. Land

G. Flora

H. Fauna

I. Noise

J. Social

K. Historic

L. Human Health & Safety

V. ALTERNATIVES

A. Alternative locations reviewed (not an in depth analysis but a general description)

B. Transfer station for waste transport to another landfill

C. Resource recovery and/or processing, and disposal of residual wastes

D. Other alternatives

E. No project

F. Larger & smaller project

VI. SUMMARY

A. Brief summary of project and existing environment

B. Identification (by use of matrix, outline, table, etc.) of all projects impacts and their respective mitigation measures

VII. ORGANIZATION AND PEOPLE CONSULTED

A. Public meetings

B. Public response to the local project

C. Persons contributing to the report and their qualifications

D. Persons consulted

TABLE II-2

MITIGATION MEASURES FOR

PROBLEMS WITH SOLID WASTE FACILITIES

MITIGATION MEASURES	TYPE OF FACILITY			
	LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Seismic Safety				
a. Reinforce Facility Structures		X	X	X
b. Avoid Placing Disposal Sites in Steep Valleys and Over Water Basins	X			
c. Avoid Placing Facility Structures Over Active Faults	X	X	X	X
Personal Injury				
a. Install Directional Signs	X	X	X	X
b. Install Fencing	X	X	X	X
c. Direct Traffic	X	X	X	X
d. Separate Loading Areas	X	X	X	X
e. Properly Maintain Equipment	X	X	X	X
f. Install/Use Proper Protective Devices	X	X	X	X
g. Install Street Lights/ Night Lighting	X	X	X	X
h. Send Public Awareness Mailers	X	X	X	X
i. Institute a Safety Program	X	X	X	X
Litter				
a. Use Litter Patrols	X	X	X	X
b. Cover Wastes	X			
c. Install Litter Fences	X		X	
d. Limit Hours of Operation	X			
e. Enclose Operations		X	X	X
f. Construct Berms	X			
g. Cover Vehicles	X	X	X	X
h. Send Public Awareness Mailers	X	X	X	X

MITIGATION MEASURES	LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
	TYPE OF FACILITY			
Degradation of Air				
a. Install Proper Air Emission Control Equipment		X		
b. Flare Gas Emissions	X			
c. Install Gas Collection Systems	X			
Gas Emissions				
a. Use Impermeable Covers and Liners	X			
b. Install Gas Collection and Control Systems	X			
c. Install Gas Extraction System	X			
d. Flare Gases	X			
Dust				
a. Wet Down Site and Vehicle Loads	X	X	X	X
b. Install Fans		X	X	X
c. Limit Hours of Operations	X		X	X
d. Enclose Grinding Operations		X		X
Visual				
a. Contour or Sculp Landfill Face	X			
b. Use Natural Barriers	X	X	X	X
c. Landscape and Revegetate	X	X	X	X
d. Construct Berms	X	X	X	X
Traffic				
a. Improve Access and Egress Roads	X	X	X	X
b. Restrict Hours of Operation	X	X	X	X
c. Install Signal Lights and Directional Signs	X	X	X	X
d. Institute Split Operations	X			
e. Increase Size of Receiving Area	X	X	X	X

MITIGATION MEASURES	TYPE OF FACILITY: LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Traffic (continued...)				
f. Limit Residential Users to Certain Days	X	X	X	X
g. Locate Facilities Close to Major Freeways, Major Arteries	X	X	X	X
h. Locate Away from Residential Areas	X	X	X	X
i. Segregate Loading Areas for Residents and Commercial Users	X	X	X	X
Archaeological/Historical Artifacts				
a. Research Literature/ Records	X	X	X	X
b. If Unearthed during Construction, Halt Construction and Notify Proper Authorities	X	X	X	X

MITIGATION MEASURES	TYPE OF FACILITY: LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Destruction of Flora				
a. Revegetate	X			
b. Transplant	X			
c. Avoid Operations in Sensitive Areas	X	X	X	X
Destruction of Fauna				
a. Relocate Rare Animals	X	X	X	X
b. Avoid Operations in Sensitive Areas	X	X	X	X
Fire				
a. Obtain Fire Suppression Equipment	X	X	X	X
b. Cover Wastes Daily	X			
c. Frequently Aerate and Monitor Temperatures				X
d. Compact Wastes	X			
e. Excavate, Spread, and Extinguish Wastes	X			
f. Secure Adequate Water Supply on or near Site	X	X	X	X
Odor				
a. Enclose Facility		X	X	X
b. Cover Material	X			
c. Compact Waste	X			
d. Install Negative Ventilation System		X	X	X
e. Mask Odors	X	X	X	X
f. Maintain Aerobic Conditions/Frequently Aerate				X

MITIGATION MEASURES	TYPE OF FACILITY LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Erosion				
a. Install Proper Drainage Mechanisms	X			
b. Revegetate	X			
c. Properly Compact	X			
d. Properly Design Waste Cells and Lifts	X			
Degradation of Water				
a. Pave Ground		X	X	X
b. Install Liners	X			
c. Provide Proper Drainage	X	X	X	X
d. Provide Drainege Sumps	X			X
e. Divert Water from Operating Face	X			
f. Provide Impermeable Cover	X			
g. Recirculate Leachate	X			
h. Purify Contaminated Water		X	X	
i. Cor :truct Dikes	X			X
j. Install Monitoring System	X			X
k. Cover Waste Storage and Processing Areas		X	X	X
l. Correctly Design Irrigation Equipment				X
m. Avoid Overwatering Windrows				X
n. Limit Amount of Liquid Entering Cell or Final Cover	X			
o. Treat Leachate and Divert to Sewer or Transport Off-Site	X			

MITIGATION MEASURES	TYPE OF ..CILITY			
	LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Noise				
a. Use Land Buffers	X	X	X	X
b. Construct Berms or Walls	X	X	X	X
c. Enclose Operations		X	X	X
d. Limit Hours of Operations	X	X	X	X
e. Install Noise Attenuation Equipment on Machinery	X	X	X	X
f. Locate Facility or Operation Far from Residential Areas	X	X	X	X
Vectors				
a. Cover Waste	X			
b. Use Insecticides	X			X
c. Compact Wastes	X			
d. Frequently Aerate Wastes				X
e. Frequent Removal of Waste		X	X	
f. Shorten Storage Time	X	X	X	X
g. Enclose Storage Facilities		X	X	
h. Maintain Proper Processing Temperatures				X
i. Avoid Overwatering Windrows				X
j. Institute a Vector Control Program	X	X	X	X
Hazardous Materials				
a. Periodically Check Loads	X	X	X	X
b. Inspect Incoming Wastes	X	X	X	X
c. Require Drums To Be Punctured and Cut	X	X	X	X
d. Immediately Remove Materials	X	X	X	X
e. Institute a Public Awareness Program	X	X	X	X

TABLE II-1

POTENTIAL PROBLEMS WITH

UNREGULATED SOLID WASTE FACILITIES

POTENTIAL PROBLEMS	LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
	TYPE OF FACILITY			
Seismic Hazards	X	X	X	X
Personal Injury				
a. Employees	X	X	X	X
b. Facility Users	X	X	X	X
Litter				
a. On-Site	X	X	X	X
b. Routes Leading to and from Facility	X	X	X	X
c. Adjacent Property	X	X	X	X
Noise				
a. Site Construction Activity	X	X	X	X
b. Site Equipment Operation	X	X	X	X
c. User Traffic	X	X	X	X
Vectors	X	X	X	X
Unauthorized Receipt of Hazardous Materials	X	X	X	X
Destruction of Flora	X	X	X	X
Destruction of Fauna	X	X	X	X
Fire	X	X	X	X
Odor	X	X	X	X
Explosion	X	X	X	X
Erosion				
a. Soils	X			
b. Waste	X			
c. Windrows				X

POTENTIAL PROBLEMS	TYPE OF FACILITY			
	LANDFILL	WASTE-TO-ENERGY FACILITY	TRANSFER STATION	COMPOSTING FACILITY
Degradation of Water				
a. Ground Water	X			X
b. Surface Water	X	X	X	X
Degradation of Air				
a. Vehicular Fuel Emissions	X	X	X	X
b. Equipment Fuel Emissions				
1. During Site Construction	X	X	X	X
2. During Operations	X	X	X	X
c. Landfill Gases	X			
d. Dust				
1. From User Vehicle Activity	X	X	X	X
2. Site Equipment Activity				
(a) During Site Construction	X	X	X	X
(b) During Operations	X	X	X	x
e. Stack Emissions		X		
Visual				
a. Change in Landform	X			
b. Unsightliness of Operation or Facility	X	X	X	X
c. Aesthetics	X	X	X	X
Increased Traffic				
a. At Facility	X	X	X	X
b. Leading to and from Facility	X	X	X	X
Loss of Archaeological/ Historical Artifacts	X	X	X	X

City of
Santa Clarita

23920 Valencia Blvd.
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City of Santa Clarita
California 91355

Phone
(805) 259-2489
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June 26, 1990

Mr. James Hartl
Director of Planning
Los Angeles County Department of Regional Planning
320 West Temple Street
Room 1390
Los Angeles, CA 90012

Subject: Hydrogeologic Considerations for Proposed Elsmere Canyon Landfill Environmental Study

Dear Mr. Hartl:

The City of Santa Clarita, the Upper Santa Clara Water Committee and the Castaic Lake Water Agency employed a Groundwater Geologist to prepare a letter report. This report delineates those specific hydrogeologic items that should be addressed to properly evaluate potential hazards to the local groundwater supply, should a landfill be located at Elsmere Canyon. [redacted]

Since approximately one half of our water comes from local groundwater supply, any degradation of this supply would have a negative impact on the quality of life of our residents, a quality which we have all been charged to maintain. We believe that the EIS being prepared for this project should address all issues outlined in the enclosed report so that a better understanding of the impacts of the landfill on our community will be gained.

Should you have any questions regarding this matter, please contact Mr. John Medina, Director of Public Works, City of Santa Clarita at (805) 255-4970. Any comments or responses, however, should be directed in written form to each of the agencies listed below.

Sincerely,

for
George A. Caravalho
City Manager

Robert C. Sagehorn
General Manager
Castaic Lake Water Agency

Dan Masnada
Chairman
Upper Santa Clara Water Committee

GAC:hj:hds

cc: Pam Holt
Enclosure

RCS

RICHARD C. SLADE
CONSULTING GROUNDWATER GEOLOGIST

RECEIVED
MAY 21 1990
PUBLIC WORKS DEPARTMENT
CITY OF SANTA CLARITA

Mr. John E. Medina, Director of Public Works
City of Santa Clarita
23920 Valencia Boulevard, Suite 300
Santa Clarita, California 91355

Re: Hydrogeologic Considerations for
Proposed EIR, Elsmere Canyon Landfill

Dear Mr. Medina:

This letter-report has been prepared to delineate specific hydrogeologic items that should be considered for the Environmental Impact Report (EIR) that is being written by others for the proposed Elsmere Canyon Landfill. The landfill site, as identified by the landfill proponent (BKK, Inc.), is reportedly to be located within the upper portion of Elsmere Canyon in northern Los Angeles County (refer to Figure 1 - Location Map - for the roughly estimated limits of the proposed landfill property).

Among the key items at this time that should be addressed within the EIR for the proposed landfill are:

1. <u>Geologic Issues</u>

   a. Adequate mapping of the different geologic formations should be provided.

   b. It is expected that original field mapping will be performed for the EIR.

   c. Validation and verification of geologic conditions on published maps should be performed by independent mapping for EIR.

   d. Identification of the various rock types and formations in the area should be made.

   e. Geologic mapping of thick and continuous sandstone and/or conglomerate beds across the landfill site is important.

   f. Geologic mapping of thick and areally extensive shale beds near the landfill is important.

g. Identification of geologic data gaps such as additional types of data needed or where those data gaps may exist in the region should be provided.

h. Mitigation measures for any of these geologic data gaps that may exist should be detailed in the EIR.

i. Provision of a detailed geologic map with the EIR; reviewing available aerial photographs for additional input to interpretations of surficial geology, geologic structure, and hydrogeology are considered important.

j. Exploration, identification, and method of identification of any landslides or landslide conditions inside and outside the proposed refuse "footprint" should be provided for and discussed in the EIR.

2. <u>Geologic Structure Issues</u>

a. Collecting a sizable number of new geologic attitudes for bedding and joint systems in all the geologic formations in and around the landfill property is considered essential.

b. Plotting newly obtained attitudes, along with others from existing maps, on their geologic map in the EIR should be performed.

c. Preparation of several detailed geologic cross sections, showing accurate contacts, bedding and joint attitudes, faults, property lines, location of proposed refuse, proposed cut areas, etc. is necessary to understand subsurface conditions.

d. Location of faults in the area, especially where these faults cross the landfill property and/or the "footprint" of the proposed refuse placement areas should be provided. In particular, one such fault needing further evaluation is the north-trending Whitney fault which possibly transects the property.

e. Determination whether any of these faults are active or potentially active together with the methods for this determination should be included in the EIR.

f. Identification of geologic structural data gaps that may exist and where such data gaps exist on the property should be discussed.

3. Hydrogeologic Issues

a. Field verification of the locations of historic and/or active water wells in Elsmere Canyon and/or its tributaries, and in Whitney Canyon to the north should be made; and acquisition of any data for any of these wells (such as well depth, perforation intervals, water levels, quality, etc.) should be attempted.

b. Laboratory testing of water quality and monitoring non-pumping water levels in any of the located water wells should be attempted.

c. Drilling of soil borings, including collecting soil samples, and installation of groundwater monitoring wells are essential for the EIR, together with inclusion of data obtained from the new wells in the EIR.

d. Inclusion of all Quality Assurance/Quality Control documentation (QA/QC) in the EIR for all drilling, sampling, and testing activities for the monitoring wells.

e. Identification of areas within and proximal to the landfill where hydrogeologic data gaps exist and determination of what types of such data still may be lacking should be discussed.

f. Providing definitive conclusions in the EIR regarding the hydrogeologic suitability of the site for a landfill is essential.

g. Preparation of representative maps illustrating groundwater flow directions in the various geologic formations, and groundwater elevation contour maps should be performed.

h. Development of an initial groundwater monitoring plan for existing water wells, and for any newly drilled onsite and offsite groundwater monitoring wells should be provided, including the locations of the wells, the frequency for water level and water quality monitoring, entities or personnel conducting the monitoring and sampling, what are the laboratory parameters to be tested for, the laboratory contracted for the work, and their QA/QC parameters.

i. Identification of upgradient and downgradient direction(s) of groundwater flow in the various geologic formations on the property, including documentation for these definitions. An analysis of seasonal variations in groundwater levels at the site should be provided.

j. Documentation of any existing groundwater quality problems currently in the area, including the nature and location of these problems is important.

k. Compilation of the history of the property and its environs in terms of prior storage, handling and/or disposal for hazardous wastes, including the present state of any such storage, handling, etc. in the subject canyon or its environs should be made.

l. Identification of the locations and types of all prior oil industry-related activities in the area, including the locations of any producing or wildcat oil wells in the area, active/inactive status, history of drilling muds disposal operations conducted in the region, etc. should be made.

m. Identification of oil seeps (historic and/or active) and location of these clearly illustrated on maps; also, the issue of the possible occurrence of petroliferous beds crossing the property at the surface, or their future occurrence in monitoring wells should be evaluated.

n. The sampling and testing of any existing oil seeps, and parameters analyzed for should be provided for in the document.

o. Locations of historic or active water seeps and springs on the property or in adjacent canyons should be clearly identified in the EIR. Potential mitigation measures should be included in the event springs are encountered during grading within the landfill property and, in particular, within the refuse "footprint" area.

p. Sampling and laboratory analysis of the quality and monitoring the flow of any active water seeps or springs should be discussed and the analytical results should be provided in the EIR.

q. Evidence for other possible areas of high groundwater on the property (reeds, phreatophytes, etc.), including viewing air photos from high water level periods used to delineate areas of shallow groundwater should be included.

r. Addressing native soil and bedrock permeabilities, which are largely engineering and geotechnical concerns, in regard to hydrogeology since these factors affect the movement of groundwater beneath the site, especially with respect to rate and possible directions of groundwater flow (e.g., contaminant migration).

s. Discussion of the possibility of hydraulic continuity from the various geologic formations on and near the landfill to known water-bearing formations and to suspected water-bearing formations in the region should be included.

t. Identification of the occurrence of groundwater in the various onsite geologic formations in terms of water table conditions, perched, confined (artesian) or semi-confined conditions should be made.

u. Investigation of the possibility of any faults acting as groundwater barriers or as conduits for groundwater flow, including methods of determination and location of these faults should be performed.

v. Maps showing locations of proximal groundwater basins and of proximal active and inactive municipal-supply water wells should be included in the EIR.

w. Characterization of fracture patterns in basement rocks, potential for preferred direction of flow, and hydraulic communication between fractures, faults, and any known and/or potentially water-bearing units should be discussed in the text.

4. Hydrologic Issues

a. Maps illustrating the watersheds of Elsmere Canyon and its tributaries should be utilized in the report.

b. Delineation of surface acreage of each watershed, including quantification of runoff characteristics for these canyons including pathways of flows before and during landfill operations.

c. Sampling and monitoring of the rates and quality of surface water runoff in Elsmere Canyon and its tributaries, and in Whitney Canyon to the north should be included.

d. Preparation of mitigation measures and plans for controlling surface water runoff through and/or onto the landfill during site development and site usage should be thoroughly presented.

e. Development of a surface water monitoring plan for Elsmere Canyon and its tributaries, and for Whitney Canyon should be included.

f. The location and possible effects of the landfill, if any, on the nearest surface water body and its water quality should be addressed.

g. The impacts of the landfill, if any, on the Los Angeles Aqueduct should be evaluated.

h. The possible impacts, if any, on the San Fernando Valley Groundwater Basin to the south should be evaluated.

5. General EIR Issues

a. The geologic portion of the EIR should be prepared and signed by a Certified Engineering Geologist.

b. Preparation and certification of the hydrogeologic and hydrologic portion of the EIR by a person who has considerable experience in groundwater monitoring plans and in hydrogeologic evaluations of landfill sites.

c. Providing details in the EIR on Title 23, Chapter 3 of the California Code of Regulations, Subchapter 15, "Discharges of Waste to Land," requirements and on how the existing site and/or their proposed mitigation measures meets each such requirement.

d. Preparing maps clearly showing the landfill property boundary and the presently proposed limits for the refuse placement.

e. Discussion of proposed plans and alternatives for liner systems, for trench-liner systems, and/or for leachate collection systems must be presented.

f. Discussion of proposed plans for gas collection systems should be included.

g. Providing mitigation measures in the EIR for eliminating geologic, hydrogeologic, and hydrologic data gaps and areas in and around the landfill where these data gaps may exist is considered necessary.

We trust this letter meets the needs of your Committee. Please contact our office if you desire any additional information.

Very truly yours,

Richard C. Slade
Professional Registered Hydrogeologist

NOTE: Originals of this letter sent to:

Mr. Dan Masnada, Chairman USCWC
Mr. John E. Medina, City of Santa Clarita
Mr. Robert Sagehorn, Castaic Lake Water Agency

Washington Office Forest Service Land Staff representatives will be out in January to discuss the exchange. We will send further direction on identification and process for handling the offered lands after the meeting. For now do not include them in your scope but be aware that we will most likely be adding them to the scope later.

PUBLIC INQUIRIES AND CONFIDENTIALITY

The Elsmere Canyon Landfill project becomes more and more controversial as time goes on. We at Dames & Moore are tasked with keeping project specific information confidential. The only information that is available to the public is the information obtained from the public scoping meetings we conducted in September. All of that information is part of a data base in the San Diego Office and is available to the public upon written request at 15 cents per page.

Due to the fact that the project is located in Los Angeles and that several Dames & Moore offices are involved in the preparation of the EIR/EIS, it is possible that individuals and /or the media may contact your offices for information. Any inquiries regarding the project should be directed through Terry Clapham, Donna Cassano or Karen McDonald in the San Diego office.

PUBLIC SCOPING SUMMARY OF ISSUES/NEW ISSUES/ SPECIFIC CONCERNS

List of Issues Ranked in Order of Importance(As indicated by Public in Response Forms):

Water Resources
Air Quality
Public Safety
Traffic
Land Use Planning
Integrated Waste Mgmt
Open Space/Visual
Geologic/Geotechnical
Biological Resources
Housing/Socio/Demo
Wind/Erosion
Surface Hydrology
Noise
Ag/Soils
Fire Hazards
Paleontologic Resources
Utilities
Cultural Resources
Energy
Public Services
Mineral Resources
Aviation Safety

Summary of New Issues:

Landfill design/liner design
Cumulative Effects
Wildlife Hazards-rodents, road kills
Litter Control
Land Exchange/Values/Parcels
Growth Accommodating
Light Pollution
Alternate Sites

Specific Concerns:

Placerita Park
Rim of the Valley Trail
Permanent Destruction of Canyon and its Resources
Significant Paleontologic Issues-Tar Pits
Property Values/Quality of Life
Hazardous Waste Screening Process
City of Los Angeles Mgmt of the Landfill
Groundwater Contamination

Alternatives to Landfilling: Recycling/Waste-to-rail/Composting
Mitigation Implementation and Monitoring
Public Involvement in the EIR/EIS Process

FINAL SCOPING REPORT
ELSMERE CANYON
SOLID WASTE MANAGEMENT FACILITY
ENVIRONMENTAL IMPACT REPORT &
ENVIRONMENTAL IMPACT STATEMENT (EIR/EIS)

FOR

Angeles National Forest (ANF)

and

County of Los Angeles Department of Regional Planning (DRP)

Prepared by:

DAMES & MOORE

D&M Job No. 21351-004-001
August 12, 1991

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1.0 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

Elsmere Corporation has proposed a landfill project in the Angeles National Forest (ANF). A joint Environmental Impact Report/Environmental Impact Statement (EIR/EIS) will be prepared for the project.

This scoping inputs report is an information document which presents the comments received from the public and regulatory agencies concerning the proposed Elsmere Canyon Waste Management Facility. This report documents a component of the scoping processes required by the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The scoping inputs in this report were received by the USDA Forest Service (federal lead agency) and the Los Angeles County Department of Regional Planning (LADRP, California state lead agency) at public scoping meetings (September 18 and 19, 1990), an agency scoping meeting (September 19, 1990), and in written comments.

In addition to the consideration of the inputs presented in this report, the lead agencies will conduct an independent review of potential environmental issues to develop the scope of the EIR/EIS. As a result, the EIR/EIS may address environmental effects, mitigation measures, or alternatives that are not identified in the comments received. All comments presented in this report which address potentially significant impacts, mitigation measures, and reasonable project alternatives will be reflected in the EIR/EIS. Although this scoping report does not individually respond to the comments raised, comments presenting opinions concerning the significance of potential impacts, appropriateness of alternatives, or effectiveness and feasibility of mitigation measures should not be presumed accepted by the lead agencies. These determinations will not be reached until the full analysis to be presented in the EIR/EIS is accomplished and the environmental review processes required by NEPA and CEQA are complete.

1.2 WASTE DISPOSAL NEED

A study was conducted in February 1988 which evaluated Los Angeles County's solid waste management system.[1] The study concluded that a waste disposal crisis would occur in Los Angeles County by 1992 if waste was not diverted from landfills, if operational landfills were not expanded and if new landfills were not sited. Another more recent study by the Sanitation Districts of Los Angeles County in 1989 took into consideration projected waste generation rates and the existing permitted landfill capacity and concluded that a crisis would occur as early as 1991 and that siting new landfills was a necessary element to avoid the crisis.

In response to the findings of these studies, a Solid Waste Management Action Plan (Action Plan) was developed and approved by Los Angeles County Board of Supervisors (April 1988) and the Sanitation Districts Board of Directors signatory to the Joint Refuse Transfer and Disposal System Agreement (May and June 1988). The Action Plan set forth specific measures needed to implement the County Solid Waste Management Plan (CoSWMP) and the California Integrated Solid Waste Management Act (AB939) to avoid the County predicted waste disposal crisis.

The Sanitation Districts of Los Angeles County in conjunction with the County of Los Angeles Department of Public Works prepared a Draft Programmatic Environmental Impact Report (DPEIR) to address the impacts of implementing the Action Plan. The DPEIR assessed the environmental impacts of the various components and alternatives of an integrated waste management system within the metropolitan area of Los Angeles. Elsmere Canyon was identified as a probable site for a new landfill in the CoSWMP, the Action Plan and LA County Sanitation District's DPEIR.

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[1]Solid Waste Management Status and Disposal Options in Los Angeles County. Department of Public Works Bureau of Sanitation, City of Los Angeles, Department of Public Works, County of Los Angeles, Solid Waste Management Department, L.A. County Sanitation Districts, February 1988.

1.3 PROPOSED FEDERAL AND LOCAL ACTIONS

The Elsmere Corporation has proposed a landfill in Elsmere Canyon. The proposed site and ancillary facilities are on National Forest Lands of the Angeles National Forest (ANF) and neighboring private lands. This proposed project is described in a project description submitted by the Elsmere Corporation (Appendix A).

Elsmere Corporation has applied for a Conditional Use Permit (CUP) with LADRP. In addition, Elsmere Corporation has proposed a land exchange with the ANF for the proposed landfill site and certain lands surrounding the area.

Numerous federal, state, and local actions are needed in order for the project to be implemented. The ANF must:

1. Determine the site capable and suitable as a landfill.

2. Determine that other reasonable sites and practical resource recovery alternatives on non-national forest land have been exhausted.

3. Determine that the site is part of the regional (county wide) solid waste disposal plan, and has been through a forest service approved public involvement process.

4. Determine that the site is large enough to be used for ten years or more.

5. Amend the Forest Land Adjustment Plan to include the site in the base for exchange.

6. Determine if the change in the ANF LRMP is significant (if found significant, NEPA environmental review including amendment of the LRMP EIS may be required prior to amending the LRMP).

7. Amend the ANF Land and Resource Management Plan (ANF LRMP) to:

    - incorporate the revised Forest Land Adjustment Plan;

    - revise the language dealing with landfills in riparian areas;

    - evaluate the change in the goals, objectives, and resource outputs described in the ANF LRMP;

- The study must also have adequate environmental analysis to justify tiering as defined in NEPA.

8. Process the land exchange

Likewise there are several local government entitlements needed for the project. The County General Plan and the Santa Clarita Area Plan will have to be amended to accommodate the exchange of the federal lands to local jurisdiction and their use as a landfill. The zoning will have to be consistent with the general plans and a CUP will need to be issued. In addition an Oak Tree Permit is required.

1.4 NEPA AND CEQA REQUIREMENTS

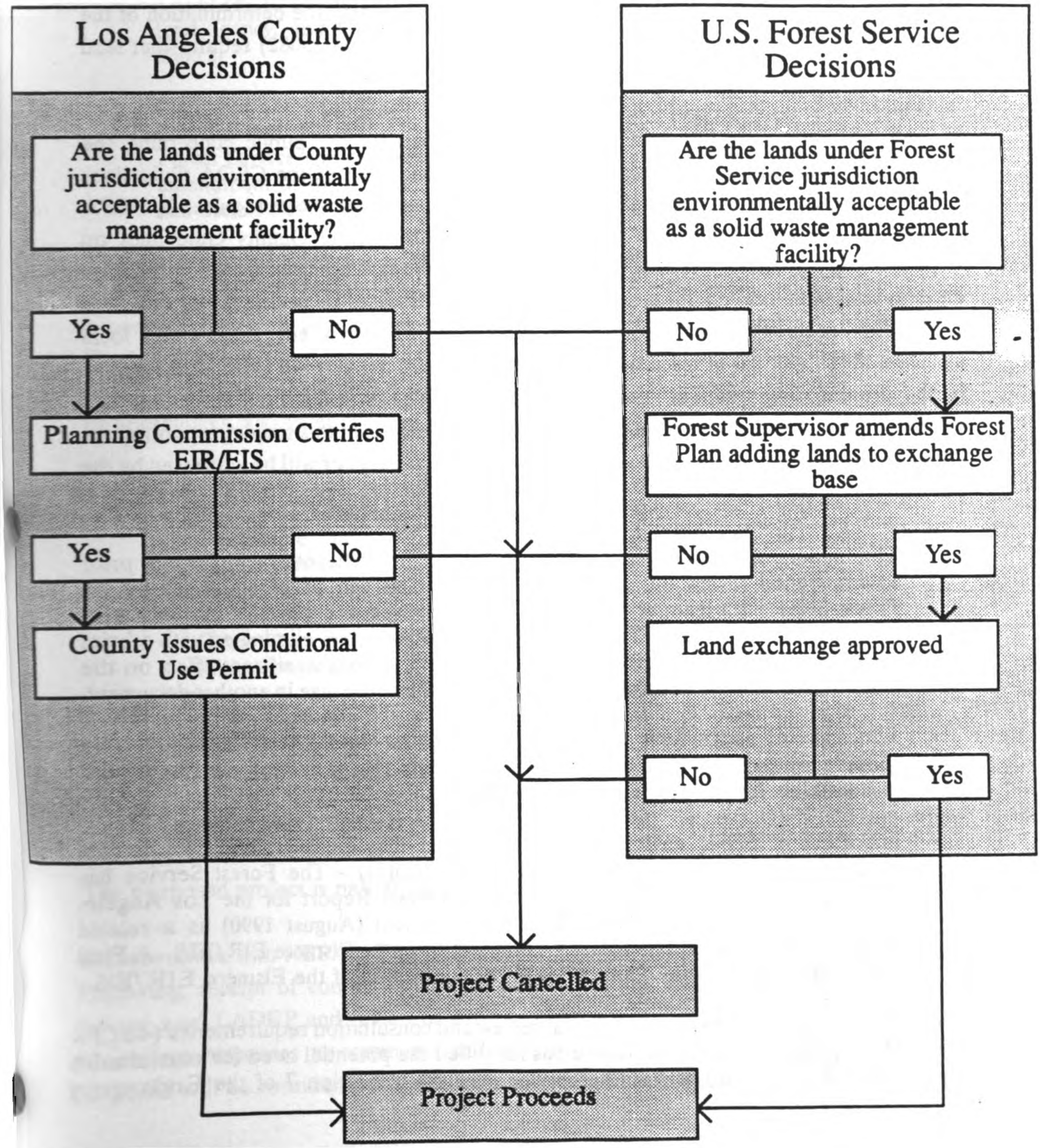
The proposed Elsmere Canyon Landfill can have potentially significant impacts upon the environment. Both federal (National Environmental Policy Act, NEPA) and state (California Environmental Quality Act, CEQA) laws require government decision makers to consider environmental impacts of and alternatives to proposed actions. In this case the two lead agencies (US Forest Service (Federal) and Los Angeles Department of Regional Planning (State)) have agreed to prepare a joint CEQA/NEPA Environmental Impact Report/Environmental Impact Statement (EIR/EIS). These two agencies will ensure that the EIR/EIS is completed in accordance with the NEPA and the CEQA (refer to Figure 1: Lead Agency Decisions Necessary for Implementation).

NEPA is the federal law covering environmental policy. It is the intent of the NEPA process to inform the public and help public officials make informed decisions on proposed projects based on the environmental consequences of a project and to implement measures that protect and restore the environment.

CEQA is California's broadest environmental law. It has four basic objectives: 1) to inform decision makers and the public about the significant environmental impacts of proposed projects; 2) to identify ways to reduce or eliminate the environmental impacts; 3) to prevent damage to the environment by requiring the implementation of feasible alternatives and/or mitigation measures; and 4) to publicly disclose the reasons an agency approved a project with significant environmental impacts.

PROPOSED ELSMERE CANYON INTEGRATED WASTE MANAGEMENT FACILITY

Figure 1: Lead Agency Decisions Necessary for Implementation



1.4.1 Determination of the Scope of Environmental Analyses

Both NEPA and CEQA include specific requirements addressing the determination of the scope of EIRs and EISs. The State CEQA Guidelines (Section 15082) require that lead agencies notify responsible agencies to solicit their input.

In addition, early consultation with interested members of the public concerning the appropriate scope of the EIR is encouraged by Section 15083 of the CEQA Guidelines although no specific procedure is described. The federal scoping process required by NEPA is more extensive. As stated in the Council on Environmental Quality Guidelines on Implementing National Environmental Policy Act Procedures, scoping is intended to provide an early and open process for determining the scope of issues to be addressed (40 CFR 1501.7), and must be accomplished with the invitation of affected federal, state, and local agencies, the proponent of the action, and other interested persons (40 CFR 1501.7(a)(1)). In the present case, this was accomplished by the invitation of written comments and conduct of public and agency meetings described in Section 2.2 of this scoping inputs report. Other requirements of the federal scoping process that has been, or will be addressed by the Forest Service, include:

- Elimination from detailed study issues which are not significant or addressed by prior environmental review (40 CFR 1501.7(a)(3)) - This will be accomplished by the Forest Service ID team review of comments received and direction to the Forest Service's EIS consultant. The EIR/EIS will address issues eliminated with a brief statement explaining why they are not expected to have a significant effect on the human environment, or providing a reference to their coverage in another document.

- Allocation of assignments to cooperating agencies (40 CFR 1501.7(a)(4)) - No cooperating agencies have been identified, and the Forest Service will assume full responsibility for the preparation of the EIS.

- Indication of public environmental assessments that are related to the impact statement under consideration (40 CFR 1501.7(a)(5)) - The Forest Service has identified the Draft Program Environmental Impact Report for the Los Angeles County Integrated Solid Waste Management System (August 1990) as a related document to be considered during the preparation of the Elsmere EIR/EIS. A Final EIR is expected to be available prior to the completion of the Elsmere EIR/EIS.

- Identification of other environmental review and consultation requirements (40 CFR 1501.7(a)(6)) - The Forest Service has identified the potential need for consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered species Act (16 U.S.C. 1531 et seq.) and the California State Historic Preservation Officer pursuant to Section 106 of the Natronal Historic Preservation Act (16 U.S.C. 470 et seq.). In addition, Los Angeles County has been identified as the California lead agency, and a joint EIR/EIS will be prepared in accordance with 40 CFR 1506.2.

- Indication of the relationship between the timing of the preparation of environmental analyses and the agency's decision making schedule (40 CFR 1501.7(a)(7) - The Forest Service will complete the Final EIS prior to its decision concerning possible amendment of the Angeles National Forest Land and Resource Management Plan and action on the Elsmere Canyon land exchange proposal.

The scoping inputs presented in this report will be considered by the lead agencies along with their review of potential environmental effects and other components of the scoping process described above to determine the scope of the Elsmere Canyon Waste Management Facility EIR/EIS. This determination will be reflected in the ongoing process of direction of the preparation of the EIR/EIS, and will consider the three types of action, three types of alternatives, and three types of impacts specified by 40 CFR 1508.25. These include:

- Actions
  - Connected Actions
  - Cumulative Actions
  - Similar Actions
- Alternatives
  - No Action
  - Other Reasonable Alternatives
  - Mitigation Measures
- Impacts
  - Direct Impacts
  - Indirect Impacts
  - Cumulative Impacts

1.4.2 Overview of the Federal Action

The proposed project is partially located on Angeles National Forest lands.

In accordance with NEPA, a Draft EIR/EIS will be issued for public review and comment. Following receipt of comments of joint public meetings to be conducted by the Forest Service and LADRP and review of written comments, a Final EIR/EIS will be prepared presenting responses to comments and the full text of comments received. This Final EIR/EIS will be considered in the development of a Record of Decision to be issued by the

Forest Service. Upon completion of the environmental analysis and public comments on the Draft EIR/EIS, the Supervisor of the Angeles National Forest will determine if the land is suitable and capable for a landfill and then consider amending the LRMP to add the Elsmere Canyon site to the Forest Land Adjustment Plan as land available for exchange into private ownership. In addition to the consideration of potential environmental impacts of the proposed solid waste management facility, the Forest Service will review the county-wide solid waste disposal plan and measures taken to implement it, including source reduction and recycling. In addition, all other reasonable sites within the County must have been identified and it must be shown that Elsmere is not the sole solution to the solid waste issue but that it is part of an integrated solution. The Forest Service uses specific criteria (ANF LRMP Standards and Guidelines Chapter 4, pages 4-37 and 4-38) in accordance with the National Forest Management Act (NFMA) when considering whether proposed changes to the ANF LRMP are significant.

If, after the completion of the NEPA process, the Forest Supervisor does amend the ANF LRMP to include Elsmere Canyon in the exchange base, then the Forest Service Regional Director of Lands may exchange Elsmere Canyon for lands of equal or better resource value and comparable economic value. The Forest Service has an ongoing agreement with the Trust for Public Lands (TPL) by which TPL holds title in trust to certain parcels of land which have been identified as desirable by the Forest Service in anticipation of exchanging these lands for the Elsmere Canyon property. Elsmere Corporation has developed an agreement with the TPL to facilitate its acquisition of Elsmere Canyon should the project be approved.

1.4.3 Overview of the Los Angeles County Action

The LADRP will use the EIR/EIS to determine whether the Elsmere Canyon site is environmentally acceptable as a solid waste management facility, (in consideration of General Plan and zoning amendments and in the consideration of the CUP and Oak Tree Permit applications). After the Draft EIR/EIS has gone through the 90 day public review period, the LADRP will make a recommendation to the Regional Planning Commission regarding the adequacy of the Draft EIR/EIS.

The Regional Planning Commission will hold one or more public hearings. At that time the public can testify for or against the project and comment further on the Draft EIR/EIS. At the conclusion of the hearing process, the LADRP will prepare written responses to substantive comments received. These written responses will be forwarded to the Regional Planning Commission and will be included as a separate volume in the Final EIR/EIS.

It is the Regional Planning Commission's responsibility to certify that the Final EIR/EIS is complete and adequate and make specific findings as to any significant impacts of the project. The Regional Planning Commission makes the decision on the CUP and Oak Tree Permits and makes recommendations to the Board of Supervisors regarding plan and zoning changes. The Commission's decision on the two permits taking further action may be appealed to the Board of Supervisors.

In accordance with CEQA requirements, responsible state and local agencies must certify that they have reviewed and considered the information contained in the EIR prior to acting upon project permit applications (State CEQA Guidelines Section 15050). As a result, actions by responsible agencies occur following the certification of a final EIR. Other State and local agencies which have been identified as potential responsible agencies include: South Coast Air Quality Management District, Integrated Solid Waste Management Board, Regional Water Quality Control Board, and California Department of Fish & Game.

2.0 SCOPING INPUTS

2.1 OVERVIEW OF INPUTS

As a component of the NEPA and CEQA scoping processes, public and agency comments were solicited by the lead agencies by newspaper publications, publication of a notice in the Federal Register, filing with the California State Clearinghouse, and conduct of public and agency scoping meetings. These activities and the inputs received are described in the following subsections of this report.

2.2 NOTIFICATION & MEETINGS

2.2.1 Notification

A Notice of Intent to prepare an EIS was published by the Forest Service in the Federal Register on September 6, 1990 (refer to Appendix C). A Notice of Preparation of an EIR was filed with the California State Clearinghouse along with an Initial Study of potential project impacts on March 9, 1990 (State Clearinghouse Number is SCH89032935). Notification of the agency scoping meeting was sent to all public agencies with potential permit review responsibilities, local jurisdictions and transportation agencies adjacent to the project site, and other agencies believed to have a special interest or expertise relevant to the review of the proposed project (refer to Appendix D: Notice of EIR/EIS Scoping Meetings, and Exhibit E: Meeting Preparation Mailing List).

An advertisement was placed in local and regional newspapers on September 13, 14 and 17, 1990 to announce the two public scoping meetings for the siting of the Elsmere Canyon IWMF. The September 13 and 14 advertisement was placed in the Los Angeles Times, all Southern California editions, the Newhall Signal, and the Valley Daily News. The September 17, 1990 advertisement was placed in the Los Angeles Times, San Fernando edition, the Newhall Signal and the Valley Daily News (refer to Appendix F: Scoping Meeting Advertisements).

2.2.2 Public Scoping Meetings

Two public scoping meetings were held in the vicinity of the project area: one was held on September 18, 1990 at Hart High School in Newhall and the other was held on September 19, 1990 at the Granada Hills Women's Club in Granada Hills. The purpose of these public scoping meetings was to present project related information to the public, describe the role of the Forest Service and LADRP, and to receive public comments on the issues to be addressed in the study.

The meetings were conducted by the Forest Service, the LADRP and Dames & Moore. Each meeting began with a statement by the proponent on the need for and description of the proposed project.

Pamela Holt of LADRP explained the County's role in the project; lead agency for CEQA compliance, project requirements, permits and certificates, the EIR/EIS process, public comment forms and comment period and the schedule for the preparation of the EIR/EIS.

Richard Borden, representing the Angeles National Forest, spoke about the Forest Service's role in the project. As a summary, the USDA Forest Service is the agency responsible for the EIR/EIS's compliance with NEPA. The Forest Service must find the Elsmere Canyon site environmentally suitable for a landfill and that it is part of an integrated waste management solution. If found to be suitable, the Forest Supervisor will consider amending the ANF LRMP to add Elsmere Canyon to the Forest Land Adjustment Plan as lands which may be exchanged. After completion of the above stated process, the Regional Director of Lands will determine whether to exchange the lands in Elsmere Canyon for private lands.

Terry Clapham of Dames & Moore explained the handouts that were distributed at the meeting, the mechanics of the meeting, and then received input from the public.

2.2.3 Agency Scoping Meeting

The agency scoping meeting was held in Conference Rooms D & E at the Los Angeles County Department of Public Works in Alhambra California on September 19, 1990 at 1:00 p.m. Two hundred and forty agencies/organizations were notified by mail, sixteen were present at the meeting. Of those present at the meeting, six submitted written comments. The total number of agency/organization respondents by the end of the scoping period (November 13, 1990) was fifteen.

2.2.4 Notice of Preparation

The LADRP issued a Notice of Preparation (NOP) in February, 1990. Fourteen agencies sent in responses to the NOP. Those responses were compared to the issues that resulted from public scoping for differences. No new issues were found.

2.3 INPUT RECEIVED

2.3.1 Meeting Transcripts

Court reporters were present at both public scoping meetings. Certified copies of the transcripts can be found in Appendices G and H in the separate Appendix Volume that accompanies this report.

2.3.2 Response Handout

The response handout that was distributed at the agency and public scoping meetings identified twenty-two issues identified by LADRP and ANF to be associated with the project (refer to Appendix B: Sample Scoping Response Handout). In the weeks following the scoping meetings, 302 response handouts were returned. The response handouts served as a vehicle for the public to rank issues that were identified prior to scoping, to add new issues or concerns, and to provide written comments regarding the project. Copies of the response handouts received during scoping can be found in Appendix I.

2.3.3 Letters

Throughout the scoping process, 60 letters were received from citizens, agencies and organizations. The letters expressed a full range of issues. The letters were read carefully and the issues were extracted from the text and entered into the database described in subsection 2.4 below. Copies of the letters received during scoping can be found in Appendix J.

2.4 SUMMARY OF INPUT

The input received during scoping from the public, agencies and organizations was gathered from public meeting transcripts, letters and scoping meeting response handouts. Hard copies of this input can be found in the project files. A computer database program was used for organization and storage of all input. The database includes the name, address, phone number (if available) and a summary of the issues and concerns of each respondent. A mailing list of respondents was generated and can be found in Appendix K.

Each handout, letter and transcript was reviewed and each issue statement was given a file number and issue area designation. The file number enables each statement to be tracked to its original comment source. This information was then entered into the database and sorted by issue area. These areas included the twenty-two identified on the Scoping Response Handout and a "new issue" category.

Once sorted, the input statements were reviewed to eliminate duplication of issues. The remaining were numbered. If two or more statements were similar, but not exact duplicates, they were given the same number for further review. The database was sorted to group the similar input statements for each issue area together.. The statements were then reviewed for placement in the scoping report. Each statement was now given a designation, as follows, depending on the subject of the input: (I) Issue, a statement regarding the issue; (M) Methodology, a statement regarding a method to assess the issue; (D) Data, a statement regarding data related to the issue; (G) Mitigation, a statement regarding mitigation for the impact at issue; or (N) Monitoring, a statement regarding monitoring of the impact at issue. The database was sorted to group the statements into these subject categories. Only statements with the subject category of "Issue" were included in the report. Input statements designated as data, methodology, mitigation and monitoring were compared to the work plan to ensure their inclusion in the scope of work.

2.5 ISSUES IDENTIFIED IN SCOPING

2.5.1 Input From Handouts

Graph 1 - "Summary of Scoping Handout Response", on the following page illustrates the results of the input on the response handouts. The graph shows the percent of the respondents ranking the issue as one of the top three concerns.

2.5.2 Written Comment Responses

The results of the scoping process identified 32 issue areas. Each issue area was subdivided into a general statement of the issue and specific issue categories were developed. Within each category, specific issues to be addressed in the EIR/EIS have been underlined and given an identifier such as G_1, G_2, W_1, etc.

1. GEOLOGIC/GEOTECHNICAL

GENERAL ISSUE AREA STATEMENT:

What are the geologic and geotechnical impacts of locating the proposed landfill in Elsmere Canyon?

Is the site geologically and geotechnically suitable for a landfill?

Will the geologic and geotechnical issues associated with the site be incorporated into the development, operation and closure of the landfill?

This general issue area consists of three issue categories.

Seismic/faulting

G_1 What will be the impacts of seismic activity to the landfill's operation systems?

- Whitney Canyon fault crosses the site. Whether or not the fault is active has not been established.

G_2 How will seismic activities in the area be impacted by the project?

- Whitney Canyon fault crosses the site.

- The weight of the landfill represents additional loading in the area.

Groundwater Quality

G_3 What is the threat of groundwater contamination and how will surrounding communities be impacted or protected?

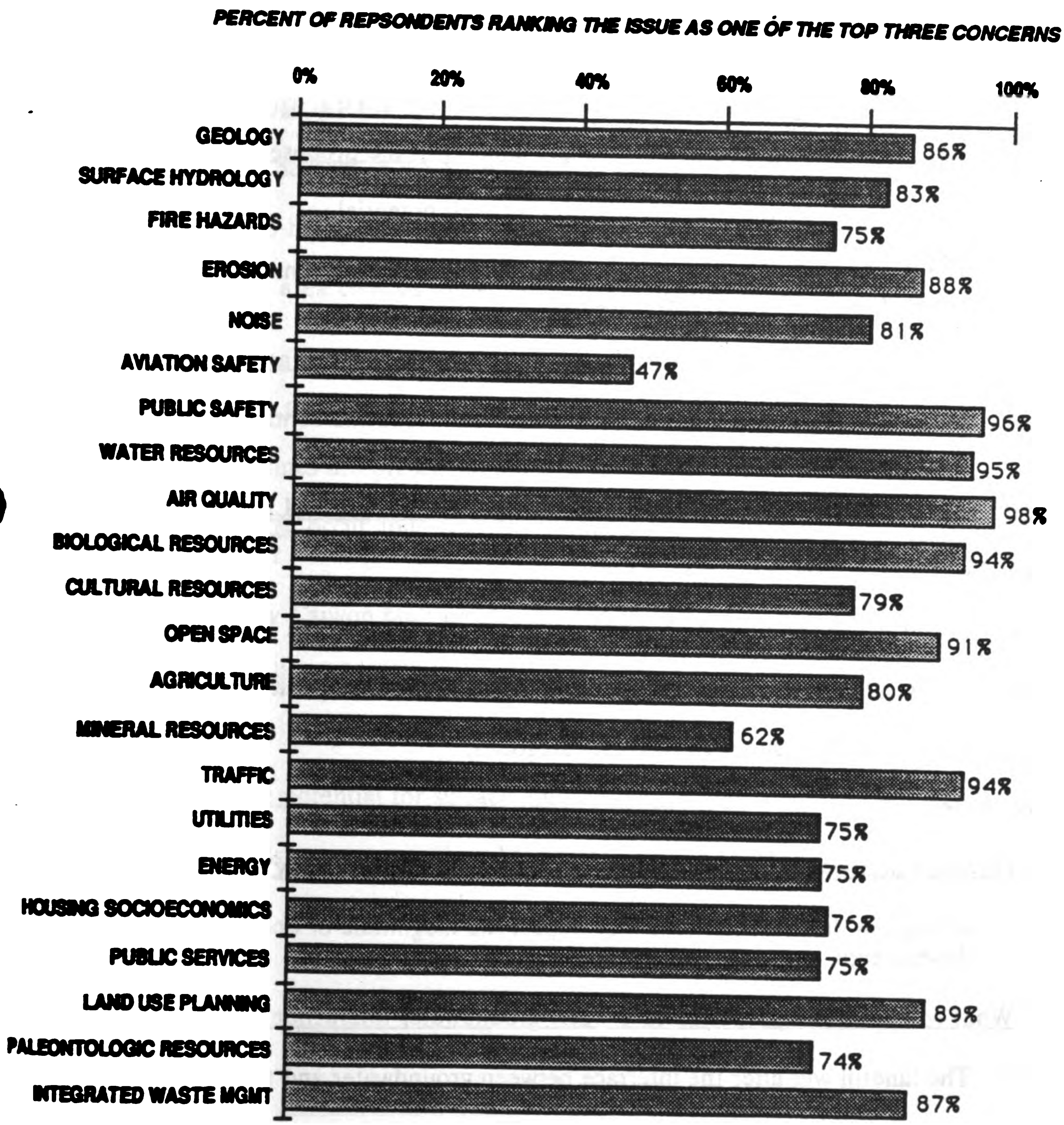
- A complex fractured groundwater system exists in the Elsmere Canyon area.

- Hydraulic continuity with the surrounding area has not been established.

G_4 Can current technology provide protection from groundwater contamination?

- Reliability of liner materials is variable.

GRAPH I: SUMMARY OF SCOPING HANDOUT RESPONSES



G_5 What are the potential impacts to the Sylmar Basin?

- The site is adjacent to the Sylmar Basin.
- A complex fractured groundwater system exists in the Elsmere Canyon area.
- Hydraulic continuity with the surrounding area has not been established.

Soil/Slope Stability

G_6 Will the landfill be stable on the soils and geology of the proposed site?

- The soils on site may have a high shrink/swell potential.
- The major portion of the surface of the landfill and the contact of the landfill with underlying soils will be on slopes.

G_7 What is the potential for a landslide of garbage in the event of an earthquake?

- The major portion of the surface of the landfill and the contact of the landfill with underlying soils will be on slopes.

2. SURFACE HYDROLOGY/FLOODING AND WATER QUALITY

GENERAL ISSUE AREA STATEMENT:

What are the surface water impacts of locating the proposed landfill in Elsmere Canyon?

What will be the impacts of the proposed project to surface water quality in the area?

This general issue area consists of two issue categories.

Surface Water

W_1 How will drainage patterns and downstream uses be impacted by the project?

- Change in drainage patterns may impact the magnitude of flooding on-site and downstream.

W_2 What will be the impact to surface water-groundwater interactions?

- The landfill will alter the interface between groundwater and the surface water.

Water Quality

W_3 Will runoff from the landfill during construction and operation be a source of contamination and degradation of streams?

- Drainage from the site will enter Newhall Creek.

3. FIRE HAZARDS

GENERAL ISSUE AREA STATEMENT:

What are the fire hazards to which the project would be exposed?

What risk exists to human life, property and environment due to landfill fires?

This general issue area consists of two issue categories.

External Causes

F_1 What is the possibility of oil pipes or power lines breaking and causing a fire?

- Power lines are present in the project area.

F_2 Should a fire occur following an earthquake, is a water supply for putting it out guaranteed?

- Whitney Canyon fault crosses the project area.
- Availability of sufficient on-site water supply is unconfirmed.

Landfill Fires

F_3 What is the potential for surface and subsurface fires?

- Landfills generate combustible gasses.

4. WIND/EROSIONAL HAZARDS

GENERAL ISSUE AREA STATEMENT:

WE_1 What will be the erosion impacts of locating the proposed landfill in Elsmere Canyon?

- Excavated slopes and cover material will be susceptible to wind (particularly Santa Anas) and water erosion.

(There were no specific issue categories raised for this general issue area).

5. NOISE

GENERAL ISSUE AREA STATEMENT:

What will be the impacts from construction and operation noise?

This general issue area consists of two issue categories.

Operations

N_1 What is the projected noise during day and night operations?

- The landfill is proposed to operate 24 hrs/per day.

Traffic

N_2 Will increased truck traffic carrying refuse create a noise problem?

- It is projected that there will be 1650 truck trips per day to the landfill site.

6. AVIATION SAFETY

GENERAL ISSUE AREA STATEMENT:

AV_1 What are the impacts of the project on aviation safety?

- Landfills attract migratory and transitory birds that may negatively impact aviation safety.
- The risk that an aircraft accident could affect landfill operations may exist.

(There were no specific issue categories raised for this general issue area.)

7. PUBLIC SAFETY/HAZARDOUS MATERIALS

GENERAL ISSUE AREA STATEMENT:

What are the impacts of the project on human health and safety?

This general issue area consists of two issue categories.

Health & Safety

S_1 What is the potential impact of vectors on the project and surrounding areas?

- Landfills attract pests.

S_2 What is the potential for accidents from contact with hazardous wastes or from structural fires?

- Waste disposed at the landfill may contain quantities of hazardous or toxic materials.

S_3 How will toxic grasses and/or methane gas fumes be handled?

- Methane gas is a product of the landfill.

- Some toxic gasses may be given off.

S_4 What is the potential risk of release of toxic emissions during landfill fires?

- Waste disposed at the landfill may contain quantities of hazardous or toxic materials.

Hazardous Waste

S_5 What are the potential impacts of "below regulatory concern" (BRC) chemical and radioactive compounds disposed of on site?

- ,(BRC) Compounds are allowed to be disposed of at Class III landfills.

8. AIR QUALITY/ODOR

GENERAL ISSUE AREA STATEMENT:

How will project development and operation affect air quality (dust and gases), and how will this impact the air quality goals of the County of Los Angeles and City of Santa Clarita?

This general issue area consists of three issue categories.

Dust

AQ_1 What will be the impacts from "fugitive dust"?

- "Fugitive dust" is associated with landfill operations.
- "Fugitive dust" contains PM_{10} (fine particles that are a respiratory hazard).

Emissions

AQ_2 How will air quality be impacted by increased truck traffic?

- It is estimated that 1850 vehicles associated with the proposed project would be entering the landfill on a daily basis.

Odor

AQ_3 What are the impacts of odors to adjacent recreational areas?

- There is the potential for undesirable odors to blow offsite.

9. BIOLOGICAL RESOURCES

GENERAL ISSUE AREA STATEMENT:

What are the biological impacts of locating the proposed landfill in Elsmere Canyon?

This general issue area consists of six issue categories.

Vegetation

B_1 Will the watershed areas with riparian vegetation along the streams be affected by grading and recontouring?

- Riparian vegetation occurs in the areas that will be graded and recontoured.

B_2 How will the project affect oak trees, black walnut, manzanita and evergreens?

- Oak trees, black walnut and manzanita are known to occur within the Elsmere Canyon Landfill project area.

- The evergreen bigcone Douglas-fir once existed in the project area.

B_3 What are the potential impacts on vegetation from landfill gas and odor?

- Landfill gas and odor could effect vegetation.

Wildlife

B_4 How will the project impact wildlife?

- Deer, bobcat, and mountain lion occur in the area.

- Noise and human activity at the landfill may affect wildlife.

- Other landfills are in the general area.

Corridor

B_5 What is the importance of the site as a wildlife corridor?

- The site is relatively isolated as it occurs adjacent to extensive urban development. However, contiguous undeveloped land in the Angeles National Forest occurs to the east of the proposed landfill site.

- Currently, wildlife dispersal to the Santa Susana Mountains is restricted by Interstate 5. Wildlife mortality due the dispersal across Interstate 5 and State Route 14 may occur.

- There is currently continuity of north-slope chaparral and woodland communities.

Sensitive Species

B_6 <u>What will be the impact to federally listed threatened and endangered or sensitive species of plants and animals</u>?

- No federally listed threatened or endangered species have been found on-site during the recent biological surveys.
- The site is within the historic range of the California condor. All remaining California condors are in captivity. All Andean condors have been removed from the historic range of the California condor.

Habitat

B_7 <u>What would be the effects of habitat loss on the carrying capacity of surrounding areas</u>?

- Chaparral, coastal sage scrub, riparian woodlands and oak woodlands are known to occur in the project area. Loss of habitat will reduce local carrying capacity.

Nuisance

B_8 <u>What effect will the potential nuisance species (gulls, rodents, etc.) have on the existing vegetation and wildlife</u>?

- The potential nuisance species will compete with local wildlife.

<u>10. CULTURAL/HISTORIC RESOURCES</u>

GENERAL ISSUE AREA STATEMENT:

What cultural resources may be impacted by the proposed project?

This general issue area consists of two issue categories.

Historic

C_1 <u>Are the remains/remnants of homesteads, oil exploration/development and mining activities known to occur in these hilly areas</u>?

- The potential for historic sites exists based on historic maps.

Ethnography

C_2 What natural resources does the canyon have that are of Native American importance?

- Native Americans consider some natural resources to have high sacred value.

11. OPEN SPACE/RECREATION/VISUAL

GENERAL ISSUE AREA STATEMENT:

What impacts will the project have on open space, recreational and visual resources?

This general issue area consists of three issue categories.

Open Space

ORV_1 How much of the existing open space/National Forest surrounding the valley will be retained and what will the effect be to remaining open space?

- The project site land will be exchanged for lands in different locations.

ORV_2 How will the project affect the City of Santa Clarita's plan to encircle themselves with a greenbelt?

- The project site abuts, but is not included in, lands under the jurisdiction of the City of Santa Clarita.

Recreation

ORV_3 What effect will the landfill have on open space, recreation and the parks of the Santa Clarita Valley?

- There is potential for impacts to open space, recreational, and park resources based on Recreational Opportunity Spectrum (ROS) characteristics established through the Forest Service Land Management Plan.

ORV_4 How will existing recreational activities be affected by the proposed project?

- Placerita Park lies approximately one mile northeast and the Rim of the Valley trail lies in close proximity to the project site boundaries.

ORV_5 What is the degree of "change of character" of project area related to the loss of public enjoyment?

- There is potential for a "change of character" of the proposed project area relating to the loss of public enjoyment from a scenic resource and open space/recreational resource standpoint. This is based on the Recreational Opportunity Spectrum (ROS) and the Visual Management System (VMS) characteristics as established through the Forest Service Land Management Plan.

ORV_6 What potential barriers/constraints will the project create for linear recreational features?

- The Rim of the Valley trail lies in close proximity to the project site boundaries.

Visual/Aesthetics

ORV_7 How will the landfill affect the aesthetic value of the canyon and mountain resources in the area?

- There is the potential for manufactured slopes and general landfill operations to be visible.

ORV_8 What sight impacts may occur, such as exposed dirt piles and animal life attracted by landfill?

- Landfill activity has the potential for being visible and the attracting of scavengers.

ORV_9 What visual impact will the access to the facility have?

- The access to the facility, and related traffic will be seen at close proximity from State Route 14.

ORV_{10} What will visual impact be in the vicinity of project from foreground, middle and background locations?

- There is the potential for impacts to foreground, middleground, and background views from locations surrounding the site based on the Forest Service Visual Management System (VMS).

ORV$_{11}$ From where in the Santa Clarita Valley is the proposed site visible, and what alternatives are being considered?

- The proposed site is potentially visible from various locations within the Santa Clarita Valley. Specific locations have not yet been identified.

12. AGRICULTURE/SOILS

GENERAL ISSUE AREA STATEMENT:

AG$_1$ What impacts will the project have on agriculture/soils?

- Soils in the project area will be impacted.

(There were no specific issue categories raised for this general issue area.)

13. MINERAL RESOURCES

GENERAL ISSUE AREA STATEMENT:

What impacts will the project have on mineral resources?

This general issue area consists of one issue category.

Minerals

M$_1$ How will the project impact metallic/non-metallic minerals and petroleum?

- Oil seeps occur in Elsmere Canyon.

14. TRAFFIC/ACCESS

GENERAL ISSUE AREA STATEMENT:

What impacts to traffic/access will the project have?

This general issue area consists of three issue categories.

Highway Traffic

T_1 How will project impact traffic during peak traffic hours on I-5/SR-14 junction and Sierra Highway?

- It has been established that the project may result in an increase of 1650 daily trucks, accessing the site from State Route 14 and Interstate 5.

T_2 How will traffic on State Route 14 be impacted by the project?

- It has been established that the project may result in an increase of 1650 daily trucks, accessing the site from State Route 14.

Other Traffic

T_3 Will the project create more traffic in the Santa Clarita Valley?

- It has been established that the project may result in an increase of 1650 daily trucks in the area.

Safety

T_4 What is the safety risk to DWP personnel using patrol roads at crossings with the project's access roads?

- There may be points of intersection between DWP patrol roads and the planned project access roads.

T_5 Will truck traffic degrade the quality of roads or cause increased hazards?

- Increased truck traffic has the potential to impact the design life of pavement structural systems. Accident rates may increase due to a rapid slowing of vehicle speeds on roads that truck traffic is using.

15. UTILITIES/INFRASTRUCTURE

GENERAL ISSUE AREA STATEMENT:

What impacts will the project have on utilities/infrastructure?

This general issue area consists of two issue categories.

Power

U_1 Under what circumstances would there be potential for impacts to transmission lines crossing the site?

- Transmission lines are located in the project vicinity.

Water

U_2 What are the potential impacts to aqueducts beneath the site?

- The First Los Angeles Aqueduct (FLAA) runs under the project area.

U_3 What is the possibility of contamination of the First Los Angeles Aqueduct by gasses or leachate?

- The First Los Angeles Aqueduct runs along the project area.

U_4 What is the potential for increased vandalism to FLAA drain valves, air inlets, and patrol roads?

- The FLAA runs under the project area and has drain valves, air inlets and patrol roads within the vicinity of the project.

16. ENERGY

GENERAL ISSUE AREA STATEMENT:

E_1 Will design plans lead to an overall energy balance for the project?

- An energy balance analysis is needed.

(There were no specific public issue categories expressed for this general issue area. However, there are two basic issues involved in addressing the energy balance question:

1. How much energy will be consumed in the construction, operation and closure of the landfill?

2. How much energy could be produced by capturing the methane gas produced by the landfill?

17. HOUSING/SOCIOECONOMICS

GENERAL ISSUE AREA STATEMENT:

What impacts will the project have on housing and socioeconomic conditions?

This general issue area consists of three issue categories.

Economic

H_1 What will the impacts to the local jobs/housing balance and the local residential population be?

- Landfill may not provide jobs for local residents.

H_2 Who will be responsible for and fund clean-up of groundwater contamination?

- Cause of contamination may not be documentable.

Property Values

H_3 What impact will the landfill have on property values in surrounding areas?

- Proximity of landfill may decrease property values.

H_4 Has the potential for change in economic productivity of adjacent lands been evaluated?

- Grazing and oil development is conducted on adjacent lands.

Quality of Life

H_5 How will the quality of life be affected by the landfill?

- Landfill will cause increased dust, traffic, odors, and visual changes in the area.

18. PUBLIC SERVICES/INFRASTRUCTURE

GENERAL ISSUE AREA STATEMENT:

PS_1 What impacts will the proposed landfill have on public services (i.e. sheriff and fire) in the area?

- The scale of the project could require increased equipment/personnel for sheriff and fire departments.

(There were no specific issue categories raised for this general issue area).

19. LAND USE/PLANNING

GENERAL ISSUE AREA STATEMENT:

What are the land use impacts from locating the proposed landfill in Elsmere Canyon?

This general issue area consists of two issue categories.

Adjacent Lands

LU_1 Will the project development impact or limit use of surrounding areas?

- Sensitive land uses occur within the general vicinity.

Forest Plan

LU_2 Are solid waste management facilities environmentally acceptable on lands under Forest Service jurisdiction?

- The Forest Plan requires that environmental acceptability be analyzed.

20. PALEONTOLOGIC RESOURCES

GENERAL ISSUE AREA STATEMENT:

P_1 Will development of the area result in disturbance, loss or destruction of scientifically important paleontologic resources?

- Occurrence of oil seeps suggests possibility that paleontologic resources are present in Elsmere Canyon.

(There were no specific issue categories raised for this general issue area).

21. INTEGRATED WASTE MANAGEMENT

GENERAL ISSUE AREA STATEMENT:

What will be the impact of Integrated Waste Management on locating the proposed landfill in Elsmere Canyon?

This general issue area consists of two issue categories.

Alternatives

IW_1 What is the relationship between L.A. County recycling and the need for additional landfills?

- Recycling will change the make-up and volume of the incoming wastestream.

Plans

IW_2 Is there an increased need for new landfills and does this need force use of Forest Service land?

- Forest Plan requires evaluation of need before allowing approval of landfill site.

IW_3 Will the addition of a new landfill hinder the recycling market?

- Availability of additional landfill capacity could slow down incentive for recycling.

IW$_4$ <u>Will the approval of the project eliminate the need for new solutions to waste problems</u>?

- Availability of new landfills may slow down the development of new solutions to waste problems.

NEW ISSUES

The following new issue areas were identified through public responses during the scoping process:

- Alternatives
- Cumulative Impacts
- Joint Powers Agreement
- Land Exchange
- Landfill Engineering
- Landfill Management
- Light Pollution
- Litter
- Project Description
- Public Involvement
- Purpose and Need

Specific concerns regarding these issue areas are described under the subheadings below.

22. ALTERNATIVES

GENERAL ISSUE AREA STATEMENT:

What other alternatives for the proposed landfill in Elsmere Canyon are being considered?

This general issue area consists of four issue categories.

Alternative Uses

A_1 What are the other potential uses of Elsmere Canyon?

- The Forest Plan allows for different types of uses of Elsmere Canyon.

No Project

A_2 Will the "no project" alternative be considered?

- NEPA/CEQA require that the "no project" alternative be addressed.

Rail Haul

A_3 Is the transport of refuse by rail to remote areas a feasible alternative for Los Angeles?

- Rail transport is being considered for another proposed landfill in Riverside County (Eagle Mountain Project).

Sites

A_4 Have all reasonable sites and practical resource recovery alternatives on non-Forest Service lands been evaluated?

- The Forest Plan requires that all reasonable alternatives be evaluated.

23. CUMULATIVE IMPACTS

GENERAL ISSUE AREA STATEMENT:

What will be the cumulative impacts of all existing, proposed and expansions of landfills to the area?

This general issue area consists of three issue categories.

Groundwater

CI_1 How does the combination of four landfills in SCV potentially impact groundwater?

- Hydraulic continuity in the area has not been established.

Socioeconomic

CI_2 What cumulative impacts will an additional landfill have on the surrounding communities?

- Several landfills already exist in the area.

Other Resources

CI_3 What cumulative effects will landfills in the area have on wildlife, air, water, and traffic?

- Several landfills already exist in the area.

24. JOINT POWERS AGREEMENT

GENERAL ISSUE AREA STATEMENT:

J_1 How does the Joint Powers Agreement between the city and county of Los Angeles impact this project?

- This agreement, which includes Elsmere Canyon, is the subject of current litigation.

J_2 What are the financial assurances, if any, made to the operation guaranteeing waste flow?

- The landfill must be economically viable.

J_3 How will price for use of the landfill impact the amount of waste and the viability of recycling?

- Depending on cost of landfill disposal, recycling efforts could increase or decrease.

25. LAND EXCHANGE

GENERAL ISSUE AREA STATEMENT:

LE_1 Does the proposed land exchange follow 1987 Angeles National Forest Land and Resources Management Plan's specific guidelines and standards?

- Forest Plan has specific guidelines and standards regarding locating landfills on forest lands.

LE_2 Has Elsmere been identified as land available for exchange?

- The Land Adjustment Plan for the Angeles National Forest identifies lands available for exchange.

26. LANDFILL ENGINEERING

GENERAL ISSUE AREA STATEMENT:

What technology is available for the safe disposal of waste

This general issue area consists of two issue categories.

Design

LFE_1 Will Title 23 requirements be met?

- Landfills are required to meet the requirements of Title 23.

Liner

LFE_2 Could oil leakage damage the liner?

- Oil seeps occur in Elsmere Canyon.

LFE_2 Can the liners withstand local geotechnical conditions?

- Whitney Canyon fault crosses the site.
- The landfill is proposed on steep slopes.

27. LANDFILL MANAGEMENT

GENERAL ISSUE AREA STATEMENT:

LM_1 What will be the role of the City of Santa Clarita in the development and management of the landfill?

- Waste will be disposed of near the city but the city may have no say in how the facility is managed.

28. LIGHT POLLUTION

GENERAL ISSUE AREA STATEMENT:

LP_1 What will be the impacts of light from the 24 hour operations of the landfill on the night sky?

- The landfill will operate 24 hours per day which will require lighting.
- Sky glow is known to occur at some 24 hour per day landfills.

29. LITTER

GENERAL ISSUE AREA STATEMENT:

L_1 What will be the impact of litter from locating the proposed landfill in Elsmere Canyon?

- Refuse blowing from the trucks and landfill will be a potential source of litter.

30. PROJECT DESCRIPTION

GENERAL ISSUE AREA STATEMENT:

PD_1 Will the impact of each stage (construction to closure) of the project be described in the EIR/EIS?

- Closure impacts are often not discussed in EIRs and EISs.

31. PUBLIC INVOLVEMENT

GENERAL ISSUE AREA STATEMENT:

PI_1 How will the public be involved in the environmental review process?

- The public is often unaware of how the process operates.

32. PURPOSE AND NEED

GENERAL ISSUE AREA STATEMENT:

PN_1 How would advances in alternative to landfilling impact the need for the proposed project?

- Success and timing of the waste reduction technology will affect the need for landfills.

APPENDIX B

NORTHRIDGE EARTHQUAKE

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APPENDIX B

NORTHRIDGE EARTHQUAKE
JANUARY 17, 1994

B.1 INTRODUCTION

B.1.1 Purpose and Intended Use of the Appendix

This appendix contains a summary of available information on the environmental effects of the Northridge earthquake. The appendix is intended to provide a basis on which to infer possible environmental effects on or from the ESWMF should a similar event occur during the project lifetime.

B.1.2 Summary of the Northridge Earthquake

A strong earthquake centered under the community of Northridge in the San Fernando Valley shook the entire Los Angeles area at 4:31 a.m. Pacific Standard time on Monday, January 17, 1994. The magnitude, originally estimated at 6.6, was later revised upward to 6.7. January 17 was a federal holiday (Martin Luther King's Birthday). Because of this and the early morning hour, most non-residential buildings were empty and traffic was light. These circumstances helped limit the number of fatalities and injuries resulting from the earthquake.

The Northridge earthquake, although not as large as some earthquakes in recent history, affected more people and caused more damage because it occurred in a heavily populated area. The epicenter of the Northridge event was directly beneath a suburban area of houses, apartment buildings, shopping malls, hospitals, schools, and a university campus. Estimates indicate that this will be the United States' most costly natural disaster ever (U.S. Department of Commerce, 1994).

The Los Angeles County Department of the Coroner (Los Angeles Times, 1994c) has attributed a total of 58 deaths to the earthquake. About 1,500 people were admitted to hospitals with major injuries; another 16,000 or so were treated and released. Estimates of the number of people temporarily or permanently displaced because of damage to their houses or apartments ranged from 80,000 to 125,000 (Earthquake Engineering Research Institute, 1994). As of early February, over 400,000 people had registered for various types of federal disaster assistance (U.S. Department of Commerce, 1994).

B.2 OBSERVATIONS AND EFFECTS AT AREA LANDFILLS

Most of the solid waste landfills within the epicentral area performed well during the earthquake with little or no damage and no significant distress to slopes or liner systems. According to the California Integrated Waste Management Board (1994), of the 15 landfills listed below, 5 had no observed damage, 4 sites experienced insignificant damage associated with minor surface cracking, tension cracks, or differential settling, and 6 sites had moderate but easily repairable damage due to surface cracking and differential settlement. A few of the landfills experienced line breaks in their landfill gas collection systems which were easily repaired after the earthquake. Minor tearing of the geomembrane portion of the landfill liner was noted at Chiquita Canyon landfill and at Lopez Canyon (side liner).

The following discussion describes the damage observed by the California Integrated Waste Management Board (1994) at Los Angeles and Ventura County landfills (both active and inactive) after the Northridge earthquake. These sites were selected for observation based on their proximity to the earthquake epicenter and their design and operating practices.

Sunshine Canyon Landfill - (inactive) The landfill is located approximately 8.5 miles northeast of the epicenter and 1.5 miles southwest of the ESWMF, and was designed prior to synthetic liner requirements. Damage to the landfill included localized differential settlement, landslides in native slopes, and tension cracking near the crown and down the north-facing south fill slope. No refuse was seen as a result of the cracking. The landfill gas flare also shut down when the landfill lost power. The flare was returned to service 2 to 3 days after the earthquake. The damage at the landfill was considered to be moderate but easily repairable.

Lopez Canyon Landfill - (active) The landfill is located approximately 10.5 miles northeast of the epicenter, and was designed with a geosynthetic landfill liner. Damage to the landfill included localized surface rupture in the roadway leading from the on-site offices to Area "A" (an inactive landfill face), localized minor surficial sloughing of near surface fill along the eastern portion of Area "A," localized breakage of the landfill gas header connections, and minor slope failures on two native/clean fill slopes behind the site offices overlooking Lopez Canyon. In addition, input and output lines to the million gallon water tank located near the flare station failed at the elbows, purging its entire contents. The landfill gas station also shut down for approximately 13 hours due to a loss of power caused by the earthquake. The damage at the landfill was considered to be moderate but easily repairable.

Palmdale Disposal Site - (active) The landfill is located approximately 35 miles northeast of the epicenter. Minor tension cracks were observed in localized areas of the terraces along the southern fill slope, along with minor rockfalls in the cut area. No damage to any of the support facilities or ground surfaces was observed. Normal landfilling and associated operations resumed within 1 day after the earthquake. Based on the limited minor tension cracks, damage was considered to be insignificant and easily repairable.

Chiquita Canyon Landfill - (active) The landfill is located approximately 13 miles north of the epicenter. Observed damage included localized differential settlement and localized tearing in the geomembrane portion of the liner system. The landfill suffered a temporary loss of power to the landfill gas flare station immediately after the earthquake; however, the landfill gas flare was returned to service later that day. The damage at the landfill was considered to be moderate but easily repairable.

Azusa Land Reclamation Company, Inc. Landfill - (active) The landfill is located approximately 38 miles east of the epicenter. No damage was observed.

Russell Moe Landfill - (closed) The landfill is located approximately 10 miles northeast of the epicenter. Trailers located on the landfill were extensively damaged, the southeastern edge of the storage area near the southern fill slope was extensively cracked, tension cracks formed along the eastern edge of the landfill and the native ground adjacent to the eastern edge of the landfill was ruptured. The owners of structures on the landfill (other than trailers) did not report any significant damage. The trailer court was ordered to be evacuated by the County of Los Angeles Fire Department, Health and Hazardous Materials Division, due to high levels of flammable gas measured on-site. The high gas levels were determined to be caused by the breakage of two natural gas lines that service the trailer court and other buildings near the landfill. The damage at the landfill was considered to be moderate but easily repairable.

Toyon Canyon Landfill - (inactive) The landfill is located approximately 15 miles southeast of the epicenter. Observed damage included minor tension cracking along the eastern and western sides of the landfill and localized differential settlement along the contact of the natural ground and refuse. In addition, a landfill gas collection well was sheared off at the connector to the lateral and the landfill gas flare station was shut down due to a power loss caused by the earthquake. Based on the limited minor tension cracks, damage was considered to be insignificant and easily repairable.

Bradley Avenue Landfills - (east landfill inactive, west landfill active) The landfill is located approximately 10 miles east of the epicenter. No damage was observed at Bradley Avenue East except the soil covering the refuse and at the landfill gas flare station pad where the fill side of the contact between intact native soils and the refuse had differentially settled up to 6 inches. Differential settlement was also observed along the liner anchor trench in Bradley Avenue West. Along the western side of Bradley Avenue West, a 10-foot tear in the geotextile overlying a geomembrane was noted. This tear had previously existed and was enlarged by the earthquake. No tears in the geomembrane were observed. The damage at the landfill was considered to be insignificant and easily repairable.

Savage Canyon Landfill - (active) The landfill is located approximately 35 miles southeast of the epicenter. No damage was observed at this site.

Puente Hills Landfill #6 - (active) The landfill is located approximately 34 miles southeast of the epicenter. No damage that could be attributed to the earthquake was observed at this site.

Spadra Landfill - (active) The landfill is located approximately 44 miles southeast of the epicenter. No damage was observed at this site.

Scholl Canyon Landfill - (active) The landfill is located approximately 21 miles southeast of the epicenter. The ground surface supporting the pads and dikes around the landfill gas condensate stripper and collection tank was significantly cracked. The stripper and tank were taken out of service and repaired within 3 days. The landfill gas collection system along the western face of the site failed. Additionally, a gas collection line was broken on the western face of the landfill. The landfill gas flare station shut down due to a power outage caused by the earthquake. A new flare station was constructed and placed in operation approximately 1 week after the earthquake. The damage at the landfill was considered to be moderate but easily repairable.

Calabasas Landfill - (active) The landfill is located approximately 10 miles southwest of the epicenter. Several gas lines had localized leaking at the landfill. The northwestern fill slope had a tension crack that paralleled the liner anchor trench along the northern side. A landfill gas flare stack was observed to be leaning into an adjacent flare stack. This is believed to have been from the earthquake or one of the many aftershocks. The damage at the landfill was considered to be moderate but easily repairable.

Simi Valley Landfill - (active) The landfill is located approximately 17 miles west of the epicenter. With the exception of the landfill gas flare going out of service as a result of a loss of electrical power caused by the earthquake, no damage was observed.

Terra Rejada Landfill - (closed) The landfill is located approximately 18 miles west of the epicenter. Surface cracking that appeared to parallel a small fault was observed in the top of the landfill. No slope failures or slumping was recorded and the damage at the landfill was considered to be insignificant and easily repairable.

In summary, geologic effects observed at landfills in the Los Angeles region subjected to strong ground shaking were minor and limited to cracking of surface cover soils and differential settlement between fill and native material. There were no indications of significant distress to slopes or liner systems and overall performance of the landfills appears to have been good.

B.3 ENVIRONMENTAL EFFECTS

B.3.1 Geology

Information on the geologic effects of the Northridge earthquake is based on seismological data collected during the main shock and aftershocks, and from observations made by geologic professionals immediately after the main event. The information presented below includes both observations in the Los Angeles region and also at the proposed ESWMF project property.

B.3.1.1 Geologic and Seismologic Setting

The San Fernando Valley area lies within the southern part of the western Transverse Range geomorphic province of California. The Transverse Ranges trend in a nearly east-west direction, having been uplifted within the past few million years along the San Andreas fault zone where it bends more sharply to the west-northwest. The majority of important faults in the western Transverse Ranges, including the San Fernando Valley area, are high-angle thrust faults that typically follow the east-west to northwest orientation of the area mountains, such as the Santa Susana Mountains and the Santa Monica Mountains. These faults typically dip to the north and northwest, although some may dip to the south. Displacement along these faults includes both components of thrusting (uplift of one fault block relative to the other block) and lateral slip (horizontal movement). This complex movement among faults in the region is due to compression developed along the bend in San Andreas fault system.

The January 17, 1994 Northridge earthquake was notable from a geological and seismological perspective, as rupture occurred along a previously unrecognized fault that dips to the south, rather than to the north or northwest. Based on seismological data from the main shock and aftershock series, the fault is interpreted to trend approximately 10° north of west and dip approximately 45° to the south. Since the fault is concealed at depth and does not reach the earth's surface, it is referred to as a "blind thrust" fault. Although south-dipping, the thrust fault is still related to the overall compressive tectonic setting in the vicinity of the San Andreas bend.

The main earthquake occurred at approximately 4:31 a.m. on January 17, 1994, and was measured at moment magnitude (M_w) 6.7. By February 5, 1994, 19 days after the main event, more than 1,178 aftershocks had been felt by Los Angeles residents and/or recorded by seismographs. A few magnitude 5 and numerous magnitude 4 aftershocks occurred, along with hundreds of smaller tremors. The aftershock sequence occurred over an area of approximately 324 square miles (832 square kilometers).

The epicenter (surface projection of the earthquake) was in the Northridge area, with its hypocenter (location of rupture) at a depth of approximately 11 miles (18 kilometers) below ground surface. Area of rupture along the fault plane was approximately 113 square miles (289 square kilometers).

Displacement along the fault, like that of other thrust faults, occurred in a compressional tectonic environment, where the block above the fault plane (upthrown block) moves up relative to the lower block beneath the fault plane. In this case, the upthrown block included the populated area of the San Fernando Valley and the Santa Susana Mountains just to the north. Oat Mountain, located in the Santa Susana Mountains, rose nearly 15 inches and moved 8 inches to the northwest almost instantaneously after the earthquake occurred.

Often as a result of earthquakes and the nature of displacement along thrust faults, both strong horizontal *and vertical* ground accelerations can result, such as were measured during the Northridge earthquake. In this case, the strong horizontal and vertical ground motion affected a densely populated area located on the upthrown block, resulting in high economic losses estimated to range from $13 to $20 billion. By comparison, the comparably sized 1971 San Fernando earthquake occurred on a north-dipping thrust fault where the upthrown block affected a far less populated area, and property damage was approximately $500 million.

B.3.1.2 Regional Data and Observations

The Los Angeles region is one of the most densely seismically monitored areas of the world and contains an extensive network of strong motion instrumentation. These instrument stations are located on the ground and in structures such as dams, bridges, and buildings. Many of the local stations are maintained by the California Division of Mines and Geology (CDMG), the U.S. Geological Survey, and the University of Southern California. Personnel from these organizations quickly recovered and processed the strong motion data following the Northridge earthquake and issued preliminary data reports.

Immediately following the Northridge earthquake, teams of geologists from state and federal agencies, universities, and consulting firms performed aerial and ground reconnaissance to assess damage and record the geologic effects of this event. Geologists searched the Los Angeles region for evidence of surface rupture along known faults, secondary faulting effects, landslides, and other ground disturbances. Hundreds of square miles were covered during this effort.

Strong Ground Motion

Preliminary review of seismograph data from stations in the Los Angeles region suggests that ground accelerations were generally higher than would normally be expected for an earthquake of this magnitude. As mentioned above, this may have been partly due to rupture along a thrust fault where strong vertical movement can occur in combination with strong horizontal motion.

The largest peak accelerations were recorded at the Tarzana Cedar Hill Nursery ground station located 4 miles south of the epicenter. Here, a horizontal acceleration of 1.82g (units of gravity) and a vertical acceleration of 1.18g were measured (CDMG, 1994).

Several other stations recorded horizontal accelerations approaching 1g. These included: (1) Sylmar Hospital (0.91g) located 10 miles from the epicenter; (2) Santa Monica City Hall (0.93g) located 14 miles from the epicenter; and (3) Jensen Filtration Plant (0.98g) located about 7 miles from the epicenter). The Sylmar station is located about 3 miles southeast of the ESWMF project property, and the Jensen Filtration Plant is approximately 3 miles to the southwest. The Los Angeles County Fire Station at Newhall, located about 3 miles to the northwest of the ESWMF project property, recorded a peak horizontal acceleration of 0.63g and a vertical acceleration of 0.62g (CDMG, 1994). This station is slightly more than 12 miles from the epicenter.

The large acceleration at Santa Monica City Hall was unusual, considering that it is located nearly 14 miles from the epicenter. By contrast, several closer stations experienced smaller ground accelerations on the order of 0.35 to 0.40g. Collectively, there is a fair amount of variation among station data with respect to distance to the epicenter and, as previously mentioned, ground accelerations were generally larger than would be expected for an earthquake of this size. There is some evidence that these effects, at least at some seismograph stations, may be partly attributed to local soil conditions and geology. Response spectra of accelerograms for several stations in the San Fernando Valley basin suggest that sediments within this basin may have had an amplifying effect on the recorded long period motions. Scientists are continuing to evaluate seismological and other data from the Northridge earthquake to better understand the strong ground motion experienced during this event.

Surface Rupture

No positive evidence of surface rupture along any faults in the region has been observed. Surface deformation was observed at Potrero Canyon and State Route (SR) 126, but this has been shown to be an area of localized extensional surface deformation and not the surface trace of the buried thrust fault that caused the earthquake. Scientists with the University of California, Berkeley, Earthquake Engineering Research Center (1994) attributed this extensional type of surface deformation to broad upwarping and upward folding along the northern flank of the Santa Susana Mountains. They noted that the bridge collapses at the Interstate 5 - SR 14 interchange could also possibly lie within an area that experienced this same type of effect.

Although fault surface rupture was not observed, localized ground deformation (some of which may be due to secondary faulting) was noted throughout the San Fernando Valley, as discussed below.

Liquefaction, Ground Cracking, and Lateral Spreading

Liquefaction is a phenomenon whereby loose, granular, saturated soils (shallow groundwater table) lose their shear strength and tend to flow in a semi-liquid state when subjected to cycles of strong ground motion. Liquefaction effects were mainly limited to isolated coastal areas where these types of soil and shallow groundwater conditions exist. Notable areas were King Harbor Marina in Redondo Beach, Coastal Areas of Santa Monica, and the Port of Los Angeles container terminal. Some inland areas of localized liquefaction and lateral spreading occurred in the Simi Valley, the Jensen Water Treatment Plant (although much less than during the 1971

San Fernando earthquake), the Lower San Fernando Dam, and along the Santa Clara River between Fillmore and Interstate 5.

In the northern San Fernando Valley, widespread areas experienced ground cracking. Compressional, extensional, and left-lateral deformation of streets, curbs and sidewalks was especially prevalent in the vicinity of Balboa Boulevard and Rinaldi Street. This deformation was responsible for ruptures to buried gas and water lines that caused major damage to homes in this area. Other areas that felt the effects of liquefaction, ground cracking, and lateral spreading included the Jensen Filtration Plant site, foothill areas in the City of Granada Hills, areas along SR 118, and the eastern end of the Simi Valley area.

Landsliding

Numerous landslides and rockfalls occurred near the coast at Pacific Palisades and in sparsely populated areas in the Santa Monica and Santa Susana Mountains, and in a few areas in the San Gabriel Mountains east of the Interstate 5 and SR 14 interchange.

The most significant damage from landsliding occurred in coastal bluffs at Pacific Palisades, where the Pacific Coast Highway was blocked and several residences were either partially or totally destroyed. Landsliding also caused damage along Angelo Drive in the Mulholland area and at the Jensen Filtration Plant (although the plant itself experienced less damage as compared to the 1971 San Fernando earthquake).

Areas of slope failures were also observed along Santa Susana Canyon Road that parallels SR 118. These varied from 25 to more than 100 feet in height and occurred both upslope and downslope of the road.

Numerous slope failures, rockfalls and ravelling in natural slopes and talus occurred in surrounding mountainous areas, particularly along access roads. Two major slides occurred at Dillon Divide, along Little Tujunga Road that links highways 210 and 14. These caused little damage but did close the road for several days until repairs could be made.

B.3.1.3 Local Observations

Immediately following the Northridge earthquake, geologists from The Janes Network (TJN), Groundworks Environmental, Inc. (Groundworks), and Dames & Moore visited the ESWMF project property and surrounding areas to perform a geologic reconnaissance and document potential ground disturbances. This included aerial reconnaissance by TJN and Groundworks, and ground checking by all three firms. The findings of this effort were presented in a report by Dames & Moore (1994a) and are summarized below.

The entire ESWMF project property was observed and photographed from helicopter reconnaissance traverses. This was performed to quickly identify potential areas of ground disturbance, fresh landsliding, rockfalls, or other special interest areas for ground checking. Ground reconnaissance included general traverses and specific locations, targeting previously mapped/inferred traces of the Whitney Canyon, Beacon, and Grapevine faults and other studied outcrops of interest. The focus was to search for evidence of potential surface rupture, ground cracks, rockfalls, landslides, or other ground deformation.

Surface Rupture

No evidence of fault surface rupture or any associated ground deformation was noted along faults mapped at the ESWMF project property or at nearby offsite locations. In addition, no localized ground deformation that could be indicative of secondary faulting was observed anywhere at the property.

Rockfalls and Landslides

Some minor areas of rockfalls were observed at the ESWMF project property. The primary area where this was noted was the steep east-facing slope of Pico Ridge where areas of talus and rockfalls existed prior to the earthquake. These areas showed signs of new rockfalls and talus debris movement, with some accumulation at the base of steep slopes along the ridge. Minor rockfalls and loosened rocks were noted along ancient landslide headwalls and a roadcut along the central portion of an old, stable large landslide mass that is traversed by a site access road. A few loosened rocks and minor accumulations of talus were noted at roadcuts along other portions of site access roads.

In general, most of the known areas where old landslides have been mapped appeared stable, with no obvious evidence of ground disturbance or indication of recent movement. One exception was observed along the headwall of a large old landslide mapped in the Towsley Formation at the southwest corner of the project property. Here, the northwest portion of the slide headwall was re-activated and extended approximately 200 feet further to the west along a fresh scarp. Vertical separation along this scarp was on the order of 3 to 4 feet.

No indication of significant rockfalls or obvious landsliding was observed within the general area or the proposed landfill footprint or surrounding vicinity.

Effects in ESWMF Project Property Monitoring Wells

During moderate to large sized earthquakes (typically magnitude 5 or greater) it is common to observe rises or drops in well water levels in response to the shock waves travelling through the earth. These effects are nearly always short-lived and most pronounced immediately following an earthquake. The rates at which wells return to previous levels depends on a number of factors, including rock properties and well construction.

Geologists from Groundworks conducted periodic monitoring of the ESWMF project property wells to assess what effect, if any, the earthquake may have had with respect to groundwater conditions. On January 19 and 20, 1994, water level measurements were initially obtained for those ESWMF wells that could be quickly reached after the January 17, 1994 earthquake. Additional measurements of water levels were then periodically measured through April 1994. These measurements were compiled with the existing water-level database. Interpretation of these data with respect to potential earthquake effects was reported in Dames & Moore (1994a).

Of 34 site wells evaluated, water levels in eight wells showed some discernible drop or rise that could potentially be attributed to the earthquake. Water level changes were observed in four other wells but the cause of the changes is difficult to interpret due to effects of recent precipitation. Water levels in 22 of the wells showed no apparent effect. Since none of the ESWMF wells contain continuous water-level monitoring devices, it is possible that water level changes in these wells could have returned to former levels before the initial readings were obtained following the earthquake. Of the eight wells definitely demonstrating some rise or fall, water levels in six had returned to previous levels as of the last available measurement in April 1994. Two other wells showed longer effects but water levels in these were noted to still be within their historic ranges.

Based on historic water level measurements, including data before and after the Northridge earthquake, groundwater flow conditions and flow direction has not changed and is still from high elevation areas at the project property (Firebreak Road ridgeline) toward the northwest along the Elsmere Canyon watershed drainage. Likewise, groundwater flow beneath the proposed disposal area is still toward the northwest along Elsmere Canyon drainage.

B.3.2 Air Quality/Public Health Effects

B.3.2.1 Air Quality Effects

Following the Northridge earthquake a number of ambient air quality monitoring stations in the South Coast Air Basin went out of service due to significant ground shaking and were unable to record pollutant levels. The monitoring stations which were able to continue recording showed increases in PM levels in the atmosphere; particularly the Los Angeles, Burbank and Long Beach stations (South Coast Air Quality Management District (SCAQMD), 1994). None of the monitors recorded violations to PM standards (Casmassi, 1994).

According to the SCAQMD, while there was no traceable cause, the increase in PM levels could have been attributed to airborne dust from landslides and loosened dirt as a result of the ground shaking. Other factors which may have contributed to the higher than normal PM levels include smoke from the large amount of fires which broke out after the earthquake, and fog (Chico, 1994).

B.3.2.2 Public Health Effects

An unusual side effect of the Northridge earthquake was a sudden outbreak of Coccidioidomycosis (also known as valley fever, Simi-Valley fever, San Joaquin Valley disease, desert fever, San Joaquin fever and several other less common names) and infant botulism. The sudden outbreak of these two diseases was suspected to originate from bacteria-rich particles suspended in the atmosphere after the earthquake and subsequent aftershocks, and during clean-up activities (Vogt, 1994).

The organism that causes Coccidioidomycosis is a fungus which grows in soil in the southwestern United States. Breathing this airborne fungus can result in infection and possibly disease. Approximately 60 percent of infected persons have no symptoms, while 40 percent develop illnesses ranging from "flu-like" symptoms to pneumonia. Coccidioidomycosis is not transmitted from person to person (Center for Disease Control, 1994).

From January 24 through May 15, 1994, at least 170 patients with laboratory evidence of a recent infection of Coccidioidomycosis were reported in Ventura County. Ventura County was not previously known to be strongly associated with Coccidioidomycosis and the number of cases exceeds those reported (52) in the County during 1993 (Center for Disease Control, 1994). During the preceding decade, less than 10 cases were reported annually in Ventura County. The increase in reported cases in the County has occurred since the Northridge earthquake, which exposed Ventura County residents to elevated levels of suspended, bacteria-rich particles. The possible association between the outbreak of Coccidioidomycosis and the earthquake is still being investigated by the Ventura County Public Health Department, California Department of Health Services and the federal Center for Disease Control. These agencies believe there is a distinct linkage between the earthquake and the disease.

Another effect of the Northridge earthquake was the increase in infant botulism. According to the California Department of Health Services (Los Angeles Times, 1994a), dust suspended in air from the ground shaking is the most likely cause of the outbreak. All of the infants (five cases reported since mid-February) who contracted the disease live in areas that were subjected to strong ground motion (Santa Monica, Granada Hills and Canyon Country). Moreover, all of the cases were reported following the Northridge earthquake. Due to the high birthrate and geographical area, California has about half of the 75 to 100 cases of infant botulism diagnosed annually in the United States. The symptoms of the disease, which only affects infants less than 1 year old, range from general listlessness and flu-like symptoms to paralysis. According to the California Department of Health Services, infant botulism was also linked to earlier earthquakes; after the 1989 Loma Prieta earthquake, two cases were recorded in the Bay Area (Los Angeles Times, 1994a). Based on data showing frequency and time of other infant botulism cases, there is a distinct pattern linking the disease to earthquake events.

The Northridge earthquake was also responsible for the disturbance and suspension of asbestos-containing material (ACM), including fireproofing and insulation. This was a significant problem primarily in older buildings, which also had the most structural damage (Dames & Moore, 1994b). The health concerns regarding ACM include degradation of air quality due to unhealthy levels of ACM particles, and contamination of clothing and other retail goods. Contaminated items were removed and subsequently disposed of in toxic waste landfills (EQE International, 1994).

B.3.3 Land Use Effects

B.3.3.1 Damage To Land Uses

Residential

Damage to residences in the region was widespread and extended to areas over 30 miles from the epicenter. Significant structural damage to residences was concentrated in the Santa Clarita

Valley to the north, south-central Los Angeles to the south, Azusa to the east, and eastern Ventura County to the west of the epicenter. Most residential structures in the vicinity of the epicenter were one-story wood houses and two-to four-story wood apartment buildings. One-story homes generally suffered little damage. Damage to one-story homes included: chimney collapse, sliding at the foundation level, masonry fence collapse, and extensive interior plaster and exterior stucco cracks. Complete structural failures to one-story residential structures was infrequent. However, a number of multi-story (two-to four-story) apartment and condominium buildings were significantly damaged, including cases of the first floor completely collapsing in older buildings (EQE International, 1994).

Most of the multi-story apartments proved to be poorly engineered wood frame buildings covered with stucco walls only, which were unable to accommodate the shear forces from the earthquake. Most of the apartments that failed (including the much publicized Northridge Meadows Apartments) had carports (referred to as "soft floors" because of their extreme flexibility) on the ground floor with the living areas located above. The lack of first-floor stiffness and strength led to collapse of the building. As with most of the commercial structures that failed, multi-story structures constructed of reinforced concrete or masonry wall performed poorly.

Mobile homes and other manufactured homes also suffered significant damage from the effects of the earthquake. Most of the damage to mobile homes was caused by trailers separating from their temporary foundations. In Santa Clarita alone, approximately one-half of the estimated 3,000 mobile homes were damaged in this manner (EQE International, 1994). Mobile homes are usually supported by small concrete and metal base supports which offer little resistance to lateral movements caused by earthquakes. Detachment of the mobile homes from the foundations had significant effects on utility lines, especially natural gas and propane lines.

Commercial

Much of the commercial development of the San Fernando Valley occurred approximately 20 years ago, prior to seismic codes (EQE International, 1994). Numerous retail centers and commercial outlets are located in the San Fernando Valley, and the larger commercial buildings are concentrated in groups along major regional thoroughfares. The earthquake caused extensive damage to commercial structures, ranging from nonstructural damage in better-built modern structures to total collapse of both old and new structures. Some of the most significant damage occurred in the large shopping centers located in the San Fernando Valley. Damage at these centers ranged from the near-total collapse of the Northridge Fashion Center to architectural finishes and facades cracking or falling off at the Topanga Plaza Mall in Conoga Park (located approximately 5 miles from the epicenter). Earthquake-affected malls and department stores included: Northridge Fashion Center, Topanga Plaza, Promenade Mall, Fallbrook Square Shopping Mall, Sherman Oaks Galleria, Sherman Oaks Fashion Square, and Panorama Mall.

Numerous single- and multi-story department stores showed evidence of having been severely shaken. Significant damage of varying types occurred. For example, south of the Northridge Fashion Center, damage to several-single story department stores ranged from the collapse of a music store to an entire wall of a concrete "tilt-up" furniture store separating and falling (U.S. Department of Commerce, 1994).

The majority of commercial structures damaged in the earthquake were built in the 1970s using certain reinforced concrete structural designs which have proven to perform inadequately during an earthquake. The Northridge Fashion Center was a 22-year-old reinforced concrete-frame structure. Similar commercial outlets built during the same period, but that had been structurally retrofitted, performed adequately.

Industrial

Industries in the affected region are mostly light manufacturing and service orientated such as: high technology, defense, and aerospace firms; small-and medium-size manufacturers; warehousing and distribution; and other miscellaneous light industries (typically found in industrial parks). With a few exceptions, heavy or large manufacturing industries are generally located in the South Bay or East Los Angeles, outside of the region that had the strong ground accelerations. For the most part, industrial facilities experienced very little damage from the earthquake and most of those surveyed had nonstructural damage to buildings (Earthquake Engineering Research Institute, 1994). Some industrial facilities did incur damage to heavy-duty process and production equipment. However, this damage was relatively easy to repair and normal operations were typically resumed within 2 to 3 days. Most oil and gas facilities, such as refineries, were generally undamaged. The favorable performance of the majority of the industrial facilities can be attributed to structural retrofitting to accommodate significant ground shaking.

Exceptions to the favorable seismic performance of industrial facilities included damage to large liquid bulk storage tanks and associated piping, and an underground oil pipeline. A crude oil storage tank failed due to extensive buckling (referred to as elephant-foot buckling) that occurred near tank toes. As a result of elephant-foot buckling, an unanchored 250,000-gallon tank located just west of the Northridge Fashion Center purged its entire contents, while a 15,000-gallon steel tank released waste oil when the support piping became unattached. The strong ground shaking from the earthquake cracked welds at several locations along a 10-inch diameter underground pipeline transporting crude oil to refineries from the San Joaquin Valley (Engineering Research Institute, 1994).

Utilities

Southern California relies on Northern California and the Colorado River for its primary water supply. January 17, 1994 was the first time in history that an earthquake resulted in the failure of the major pipelines that feed water to the region's water treatment facilities.

One of the most significant failures that contributed to the disruption of the water supply system occurred to the Los Angeles Department of Water and Power (LADWP) Aqueduct No. 2 at Terminal Hill, located above Magazine Canyon. The reinforced concrete relief tank on top of Terminal Hill appeared to perform well through the earthquake. However, the 77-inch diameter steel pipeline that transports water up from the canyon to the relief tank separated from its saddle support, shattering the saddle at a number of locations. In two locations, the pipeline sections bulged approximately 6 inches. In two other locations, the pipeline ruptured, purging thousands of gallons of water. Repair of the pipeline sections began immediately after the earthquake. The repair was completed by January 19 and the pipeline was returned to service by January 20. However, leakage was subsequently found in two additional locations and operations were stopped until repairs could be completed. The pipeline was back in service on January 24. Additional disruption to the water supply system was caused by damage to the LADWP's Aqueduct No. 1 at the Elsmere, Whitney and Soledad siphons. Aqueduct No. 1 suffered significant buckling, shattering the 10-foot diameter pipeline/siphon in a number of places. The 80-year-old pipeline was taken out of service immediately after the earthquake until repairs were made. As of July 1, Aqueduct No. 1 was back to operating at its normal service level. Collectively, LADWP's Aqueduct Nos. 1 and 2 represent approximately 75 percent of the water supply to the City of Los Angeles (Miller, 1994).

LADWP's distribution system includes more than 100 storage reservoirs; 11,200 kilometers of mains; and 630,000 service connections. Storage reservoirs generally performed well, except for several aboveground steel tanks. Some of these tanks failed in the earthquake. Tank failures were caused by failure at bases and roofs. Several others emptied due to inlet-outlet pipe damage. At the 9,500-acre-feet Los Angeles Reservoir, just south of the Los Angeles Aqueduct Filtration Plant, minor cracking was observed in the asphalt lining (EQE International, 1994).

In addition to the damage suffered by the pipelines, the water treatment plants (Metropolitan Water District's Joseph Jensen Filtration Plant, LADWP's Aqueduct Filtration Plant and Castaic Lake Water Agency Water Treatment Plant) which provide water service to the affected areas were forced out of service for 24 to 36 hours following the earthquake. However, the plants suffered relatively minor damage due to the extensive earthquake retrofit measures incorporated into their structural design. The earthquake damage included lateral spreading of the ground or soil settlement around facility foundations and leaks in underground water mains and water basins. The soil failure also damaged buried electrical conduits and chlorine solution lines. Although the treatment plants were out of service temporarily, storage reservoirs and other treatment plants outside the immediate area that remained on-line supplied water to most of the valley (EQE International, 1994).

Once the treatment plants were back on line and the associated supply pipelines were repaired, the system still failed to provide water to customers (especially those in the epicenter area) because of the failure of the water supply distribution network. Thousands of mainline leaks were reported and the repairs were time consuming. A boil order remained in effect for 2 weeks because of possible contamination from the numerous breaks in the water supply lines.

Castaic Lake Water Agency, the water supplier to local water purveyors in the Santa Clarita Valley, suffered significant damage to their 54-and 21-inch distribution lines (Carr, 1994). The majority of line failures occurred at the joints where the line bent at grade changes. The 54-inch diameter primary treated water transmission line feeding the Santa Clarita Valley experienced a failure rate of approximately two breaks per mile. The 21-inch line experienced a high amount of failures in isolated areas and is currently decommissioned while approximately 3,000 feet of new pipeline is installed. The line is expected to be in full operation by the end of August 1994 (Carr, 1994).

Electrical service in the affected area is provided primarily by LADWP and Southern California Edison Company. Some transmission towers (66, 115 and 230 -kilovolt [kV]) suffered significant damage, many as a result of foundation failure/disruption. Damage occurred to several high voltage substations near the epicenter, such as Sylmar, Pardee, and Rinaldi. At these substations, porcelain equipment elements and other fragile parts of 230 kV and 500 kV rating suffered the most damage (Tognazzini, 1994). High voltage substations designed after 1971 generally had substantially less damage than older facilities (EQE International, 1994).

In general, telephone facilities and equipment performed well during the earthquake. Main switch/transmission equipment and overhead lines performed extremely well compared to past earthquakes. Three telephone central offices (COs) were significantly affected from the power outage. COs rely on electric power to run air conditioning facilities to cool the equipment. At one point following the earthquake, it was necessary to temporarily transfer network control to a CO in Northern California. In addition to losing electric power, some of the COs in the epicenter area suffered structural damage; however, there was no damage to equipment inside. Extensive earthquake retrofitting prevented significant damage to telephone communication facilities (Earthquake Engineering Research Institute, 1994).

B.3.3.2 Land Use Losses

Residential

In the City of Los Angeles, the Department of Building and Safety inspected approximately 100,000 residential buildings suspected of structural damage. Of the structures inspected, approximately 2,000 were tagged as Unsafe (red tag) and another 9,000 were tagged as Limited Entry (yellow tag). Approximately 63,000 residences were given green tags indicating that the dwelling is structurally safe for occupancy, although damage to nonstructural or architectural features is present (i.e., hanging lights, broken utilities, broken windows). The remaining 26,000 residences which were inspected were designated safe for occupancy. The Department estimates that about 30,000 dwelling units had been vacated following the earthquake (Steinbock, 1994).

In addition to the City of Los Angeles, a number of other jurisdictions suffered residential losses (i.e., tagged red or yellow). These included approximately 55 in Santa Clarita, approximately 23 in San Fernando, and approximately 18 in Simi Valley (Foy, 1994; Phillips, 1994). According to the County of Los Angeles Building and Safety office, less than 100 residential structures were tagged Unsafe or Limited Entry in the unincorporated parts of Los Angeles County (Phillips, 1994).

Losses to mobile homes were significant, especially in the Santa Clarita Valley. Approximately 150 mobile homes burned in three mobile home parks in the Sylmar area. These fires were generally attributed to breaks in the gas lines (Earthquake Engineering Research Institute, 1994). Other significant residential loss due to fires were reported in Northridge (17) and an apartment complex in Granada Hills. Also in Granada Hills, five homes burned from a ruptured gas line on Balboa Boulevard.

During the first week after the earthquake, approximately 20,000 persons utilized parks and open space to live. Shelters and "tent cities" provided by the Red Cross and Salvation Army were set up at various locations to accommodate those who were displaced. According to the Red Cross, approximately 41 shelters were established at the peak of the emergency (Earthquake Engineering Research Institute, 1994).

Commercial

According to the City of Los Angeles Department of Building and Safety office (Steinbock, 1994), approximately 459 commercial structures experienced a temporary or permanent loss of function from the effects of the earthquake. In addition to the City of Los Angeles, approximately 25 commercial structures were lost in Santa Clarita, and approximately eight in San Fernando.

Large amounts of inventory/goods were lost due to: (1) collapsed ceilings and walls; (2) collapsed displays and storage shelving; and (3) water damage from broken sprinkler systems. Affected commercial outlets experienced temporary loss of function ranging from 2 to 3 weeks (for those which suffered nonstructural damage) to an estimated 1 to 2 years for structures which suffered major structural damage or had collapsed (EQE International, 1994). A number of multi-level parking structures were damaged or collapsed. Commercial outlets that relied on these structures for employee and/or customer use experienced business disruption due to lack of parking even after their normal commercial functions were restored.

Industrial

Most of the industrial facilities surveyed after the earthquake had very little structural damage. Facilities that were impacted suffered mostly inventory loss and short-term business interruption.

Utilities

Refer to Section B.3.5.1 (Utility Service Interruption).

B.3.4 Transportation Effects

Most of the 600-mile metropolitan Los Angeles freeway system survived the earthquake with minor or easily repairable damage. However, the extensive damage or collapse of some freeway structures (highway overpasses and bridges) caused significant disruption after the earthquake.

In addition to the direct cost of repairing or replacing earthquake-damaged structures, there were significant economic and social costs resulting from transportation delays. Also, bridges that were taken out of service by the earthquake hampered emergency response efforts immediately after the event.

B.3.4.1 Damage to Transportation Systems

Extensive damage to highway overpasses and bridges occurred throughout the epicenter area. Major damage and collapse were observed on Interstate 5, 10, 210, and 405; State Routes 14 and 118; and U.S. 101. Types of damage that contributed to the freeway collapse included shear failure of columns and bents (also referred to as piers and beams), structural damage to end walls and wing walls at abutments, and movement at expansion joints. The most significant freeway structure failures are described below.

Interstate 10 (The Santa Monica Freeway)

The Santa Monica Freeway, the busiest freeway in the U.S., is the major east-west artery running between Santa Monica and downtown Los Angeles. Major bridge collapses occurred in two separate locations: (1) the La Cienega Boulevard/Venice Boulevard Separation; and (2) the Fairfax Avenue/Washington Boulevard Undercrossing. The bridge structure spanning La Cienega Boulevard/Venice Boulevard was extensively damaged. A portion of the westbound lane entirely collapsed while the eastbound lane suffered relatively minor damage, remaining primarily at its original elevation. The damage was attributed to the inability of the small columns to absorb the associated energy generated by the earthquake (U.S. Department of Commerce, 1994).

The Fairfax Avenue/Washington Boulevard Undercrossing suffered partial collapse of two spans of the eastbound and westbound lanes resulting in the offset of the roadway abutment by approximately 4 feet. As with the La Cienega Boulevard/Venice Boulevard Separation, the damage was attributed to the inability of the small columns to absorb the earthquake energy. The adjacent Cadillac Undercrossing, which had been retrofitted with full-length steel jackets suffered no visible damage (U.S. Department of Commerce, 1994).

State Route 14 (The Antelope Valley Freeway)

Two bridges partially collapsed at the intersection of SR 14/I-5: the SR 14/I-5 Separation and Overhead (Ramp C), which is the ramp linking southbound SR 14 to southbound I-5; and the North Connector Overcrossing (Ramp M), which is the ramp linking southbound SR 14 to northbound I-5 (U.S. Department of Commerce, 1994). The damage to the two ramps was attributed to the inability of the small columns to absorb the earthquake generated energy. In addition to the two collapsed ramps, there was evidence of pounding between spans at several hinges, and offsets (horizontal and vertical) were observed between the ends of the spans.

The SR 14/I-5 interchange has been the subject of previous retrofitting activities. This interchange was designed in 1968 and was under construction in 1971 when portions were damaged by the San Fernando (Sylmar) earthquake. At that time, one of the completed ramps in the interchange collapsed, and two ramps which were under construction were damaged. The segment which collapsed in 1971 was the South Connector Overcrossing, connecting southbound I-5 with eastbound SR 14. This ramp was subsequently rebuilt with improved reinforcement techniques, and it suffered no significant damage from the Northridge event. The damaged portions of the two ramps under construction in 1971 were repaired in place, but not strengthened; the portions not yet constructed were completed with limited seismic upgrading. The two ramps which partially collapsed in the Northridge earthquake were the same two under construction at the time of the 1971 earthquake.

State Route 118 (The Simi Valley Freeway)

SR 118 is the major east-west transportation route for northern Los Angeles County. A number of bridges along SR 118 received minor, repairable damage, but two bridges were damaged severely. Portions of a bridge collapsed at the intersection of San Fernando Mission Boulevard and Gothic Avenue, and nearby there was severe pier damage and a near collapse of the bridge at Bull Creek Canyon Channel (U.S. Department of Commerce, 1994).

Interstate 5 (The Golden State Freeway)

Interstate 5 is the major north-south transportation route in California. At its crossing with Gavin Canyon (Old Gavin Road), approximately 2 miles north of the SR 14/I-5 intersection, two parallel bridges collapsed from failure of three of the four end spans. These bridges were constructed in 1967, prior to revised design standards. The tall, flexible piers of the two center bents remained upright. Demolition of both bridges was completed a few days after the earthquake (U.S. Department of Commerce, 1994).

The majority of the freeway structure failures were caused by: (1) failures of the smaller columns or piers which support the roadway, such as in the failures at the I-5/SR 14 Interchange, the SR 118 at Mission-Gothic, and the I-5/SR 118 Southwest Connector; (2) bridge/overcrossing alignments of irregular plan configuration, such as the case at the I-5 bridge at Gavin Canyon, the SR 118 bridges at Mission-Gothic, and the Bull Creek Canyon Channel; and (3) skewed bridge/overcrossing alignments. During an earthquake, long columns survive the event because they are more flexible and forgiving and have the ability to absorb energy generated from the earthquake. Short columns, unable to bend because they are inherently the "stiffest" columns in the structure, absorb a large share of the horizontal energy produced by longer columns and subsequently fail. As a result, these short columns have been the focus of the retrofitting activities. One of the methods used to increase the resiliency of the older columns/structures in an earthquake is jacketing. Jacketing is accomplished by wrapping the columns in steel casings to keep the column from splitting during the earthquake (Los Angeles Times, 1994b).

Failures were also associated with bridges having skewed alignments or irregular plan configurations. The potential for seismic damage to bridges having skewed or irregular alignments was known before this earthquake, yet relatively little has been done to address this problem. Different retrofitting methods for these type of bridges and roadways are currently being developed.

There are approximately 12,000 state-owned highway bridges in California, and 2,523 of these are located in Los Angeles County. In California, approximately 1,313 highway bridges have been identified by the California Department of Transportation (Caltrans) as needing seismic retrofitting, and of these about 20 percent have been retrofitted. Of the highway bridges in Los Angeles County, approximately 716 need seismic retrofitting, and approximately 16 percent of these have been retrofitted. By 1995, the remaining are expected to be completed (U.S. Department of Commerce, 1994).

In general, structures which were seismically retrofitted by Caltrans performed well. Moreover, structures designed to current standards (developed after the late 1970s) appear to have performed well. This indicates that, if the damaged structures had been seismically retrofitted or designed to current standards, many of the failures would not have occurred.

B.3.4.2 Effects on the Transportation Circulation System

Interstate 10

The I-10 was essentially closed between Washington Boulevard and La Cienega Boulevard. Separate alternate routes were established for carpools and single-occupant vehicles. During the reconstruction process, carpools in both directions were allowed to use portions of the closed freeway from Western Avenue and Washington Boulevard, reentering the freeway again at Fairfax Avenue. Single-occupant vehicles in both directions had to use several surface streets before reentering the freeway (Caltrans, 1994). As of July, all lanes of the I-10 were reopened (Marino, 1994).

State Route 14

After the earthquake, SR 14 provided two mixed-flow lanes and one carpool lane going northbound and one carpool lane going southbound to the I-5 interchange. The Sierra Highway provided an alternative route for southbound SR 14. The Sierra Highway, Placerita Canyon and San Fernando on/off ramps were closed occasionally during the repairs to the SR 14/I-5 interchange (Caltrans, 1994). As of July 8, the southbound SR 14 to the southbound I-5 (Ramp C) was opened. Repairs to the transition between the southbound SR 14 onto the northbound I-5 (Ramp M) will be done by late 1994 or early 1995 (Marino, 1994).

State Route 118

As a result of the bridge damage at Mission-Gothic and Bull Creek Canyon Channel, SR 118 was closed from Balboa Boulevard to I-405 for about 2 weeks following the earthquake (Daily News, 1994). A detour was devised in early February which allowed for traffic in both directions, utilizing the westbound side of the original freeway (three lanes in each direction). While all traffic was diverted to the westbound side, repairs were made to the eastbound side of the roadway. Repairs eventually permitted the re-opening of the eastbound SR 118 while the westbound side of the roadway was taken out of service for repairs (Caltrans, 1994). As of May 13, eastbound traffic lanes were re-opened for two-way traffic. The westbound side of the roadway is scheduled to re-open by late October 1994 (Marino, 1994).

Interstate 5

Due to the bridge collapse at Gavin Canyon, all lanes were closed in both directions on the I-5 from Weldon Canyon to Calgrove Boulevard. Detours for north/southbound I-5 traffic were made available on the Old Road and Sierra Highway via San Fernando Road (Daily News, 1994). From Weldon Canyon at Gavin Canyon past the I-5/I-210 Interchange, travel lanes operated in both directions on the I-5. As of May 18, repairs to the I-5 at Gavin Canyon were completed and travel in both directions resumed. The I-5/I-210 Interchange, which performed well during the earthquake, has been designated by Caltrans as one of the next structures to be retrofitted (Marino, 1994).

B.3.4.3 Effects On Other Transportation Systems

Airports

There are nine airports in the region. Runways and taxiways were shutdown as a precautionary measure for inspection. No damage was observed and operations were resumed. No structural damage was observed in airport facilities. A number of airports did suffer nonstructural damage, such as fallen ceiling tiles and failed water pipes (U.S. Department of Commerce, 1994).

Railroad

A 64-car freight train traveling through Northridge derailed at the time of the earthquake. Twenty-five cars derailed, some of which contained sulfuric acid or diesel fuel. There were no casualties resulting from the incident (U.S. Department of Commerce, 1994).

B.3.5 Socioeconomic Effects

B.3.5.1 Utility Service Interruption

Water

Water supply and distribution systems were affected by numerous pipeline breaks in the epicenter area. The Castaic Lake Water Agency, which is the primary water supplier to the Santa Clarita Valley, was forced to periodically interrupt water supply service to local water purveyors in the epicenter area for approximately 60 days while the system was repaired.

Restoration of the water system is expected to cost approximately $1.5 million, and an additional $1.5 million has been requested to retrofit the system to reduce possible future earthquake damage (Carr, 1994).

LADWP outages were significant around the northern rim of the San Fernando Valley because of reservoir and line breaks, and power loss to pump stations serving these upper elevations (power was out for 2 to 3 days). Many reservoirs were drained within the first few hours after the earthquake. Pipeline breaks or leaks in the distribution system included 20 in major trunks, more than 450 in mains, and several hundred in smaller service lines. All trunk and main breaks were repaired within 10 days. More breaks were being discovered as lines were pressure tested, disinfected, and recharged. Piping break repairs were expedited by more than 20 crews being added to LADWP's 30. These additional crews were from mutual aid, such as other water districts throughout the Los Angeles region and the rest of California, and outside contractors. After 10 days, water service to all area mains was restored (EQE International, 1994).

Local water purveyors experienced a relatively short delay in water service. The Santa Clarita Water Company only experienced 2 to 3 days of service interruption. During the interim, water was supplied by local water wells (Carr, 1994).

Electricity

Earthquake damage to transmission towers, converter stations and substations resulted in widespread local and isolated remote power outages lasting from a few minutes to several days. Electrical power was lost throughout the Los Angeles area after the earthquake, the first time in history that this happened. Approximately 2.6 million customers in the Los Angeles area lost power immediately after the event. In addition, 600,000 customers in nearby cities from Montebello to Santa Barbara lost power (Earthquake Engineering Research Institute, 1994). Because of the interconnection of power grids, electric service was lost for periods of time throughout the western U.S. and Canada. Outside of the Los Angeles basin, the most disruptive effect was in rural Idaho where 150,000 customers lost electricity for up to 3 hours. Power was restored to approximately 900,000 customers by January 17. Essentially all power was restored by January 26 (Tagnazzini, 1994). Restoration of the electric distribution facilities is expected to cost approximately $3 million (Earthquake Engineering Research Institute, 1994).

Telephone

Post-earthquake call volume overwhelmed telephone COs, resulting in call interruptions and delayed dial tones. As an example, the telephone call attempts at one CO increased from 2,000 per hour to 250,000 per hour (EQE International, 1994). Because of the electrical power outage and equipment failure, network control was transferred from the local telephone network control center to a CO in Northern California in order to continue telecommunication service. Once electric power supply was returned, the local COs regained control of the telephone network. While telephone communication was adversely affected, telephone service was never completely lost.

B.3.5.2 Public Service Interruption

Fire

Fire protection service to the earthquake-affected areas was provided primarily by the Los Angeles Fire Department along with local fire departments providing service to their respective jurisdictions. The Department reported approximately 475 nonmedical incidents occurring from 4:38 a.m. (7 minutes after the earthquake) until 11:41 p.m. on January 17 (EQE International, 1994). This contrasts with a typical daily total of 50 to 100 nonmedical incidents (Earthquake Engineering Research Institute, 1994). Generally, fire protection service was judged to be adequate in responding to critical calls. Response was prioritized based on a survey of the service area or neighborhood (Los Angeles Times, 1994c). Critical responses included major structural fires or failures, gas leaks, and hazardous material incidents. Fire protection service was inhibited by lack of water service or water pressure.

Police and Emergency Response

The state uses an emergency response organizational framework called the incident command system (ICS), which is designed to facilitate coordination of emergency response activities and resources among various governmental levels/agencies. During the Northridge earthquake, the Los Angeles County Sheriff Department was the primary coordinator for the ICS, coordinating emergency service response and essential resources and services. The Department also provided assistance to area security and traffic control in cooperation with the National Guard and local police protection agencies. According to the Department, less than ten cases of looting were reported after the earthquake (Boal, 1994).

According to the Department, post-impact response activities were handled well and the emergency response system had the capacity needed to handle the demands of the earthquake (Boal, 1994). Factors which accounted for the success of the emergency response system included: recent success of the ICS during recent natural disasters (fire, flood) and the Los Angeles riots; time of day the earthquake occurred; and the majority of the resources needed to carry out emergency response activities were not damaged and were otherwise available (Earthquake Engineering Research Institute, 1994).

Solid Waste Disposal

As described in Section B.2, damage to landfills in the earthquake-affected areas was minor and easily repairable. As a result of the good performance of the landfills, waste disposal service was not significantly interrupted after the Northridge earthquake. Earthquake-generated debris is currently being handled and transported by private contractors to recycling centers, stockpiles or landfills. The City of Los Angeles, with the assistance of the Federal Emergency Management Agency, is opening recycling centers around the earthquake-affected areas to accept debris. According to the City of Los Angeles (Edwards, 1994), approximately 88% of the debris is recyclable (i.e., composting, scrap metal, construction material, aggregate and uses at landfills). Debris material which cannot be recycled will be accepted at landfills.

Hospitals

The Northridge earthquake was directly or indirectly responsible for thousands of injuries ranging from crush injuries, burns, lacerations, and bruises. Within 72 hours of the event, area hospitals reported treating over 2,800 persons, hospitalizing 530. By January 27, the number of hospital-treated injuries had exceeded 7,000 (Earthquake Engineering Research Institute, 1994).

The earthquake caused considerable disruption to health services. Structural and nonstructural damage forced the evacuation of patients. Noncritical patients were discharged in anticipation of incoming patients. Structural damage forced St. John's Hospital in Santa Monica, Olive View Medical Center and Holy Cross Medical Center, both located in Sylmar, to stop operations. Due to the extensive health care facilities in the area and the ability to segregate patients based on priority, sufficient health care resources were able to accommodate the demand (Earthquake Engineering Research Institute, 1994).

B.3.5.3 Estimated Recovery Costs

In the 6 months following the Northridge earthquake, state and federal governments committed $5.5 billion to assist individuals, families, businesses, public agencies and local jurisdictions in the recovery process. In all, the federal government has allocated up to $11.2 billion to pay for recovery costs. More than 597,000 applications were filed in the 6 months following the earthquake, the largest number for any single disaster in U.S. history. In comparison, 304,000 applications were filed for the Hurricane Hugo disaster in 1989, which was the largest number for a single disaster until the Northridge earthquake (Federal Emergency Management Agency, 1994).

Residential Impacts

As of July 14, the FEMA had issued approximately 374,000 checks worth a total of $940 million in assistance through the Disaster Housing Program. The Program reviews victims' applications, assesses eligibility for various forms of housing assistance, and if needed makes funds available for temporary housing, alternate housing and emergency home repairs for those applicants whose home has been condemned or severely damaged. FEMA's Individual and Family Grant Program, which makes grants of up to $12,200 to families who are affected by disasters and handles hardship cases unmet by other federal relief programs, had approved more than $88 million in grants. As of July 1994, the Program had received approximately 100,000 applications (FEMA, 1994).

The Federal U.S. Small Business Administration provides low interest, long-term loans to both homeowners and business owners that experience disaster losses, along with providing "individual and family grants" for those cases which are denied a loan. Homeowners could qualify for loans of up to $200,000 for home repairs or for refinancing, and up to $40,000 for replacement of personal property. As of August, the Administration had approved 87,000 low-interest disaster loans worth a total of $2.7 billion for home, business and personal property losses and for implementation of measures taken to reduce the effects of future disasters (Skowbo, 1994).

A number of other programs are providing assistance to households that suffered losses in the earthquake. The Housing and Urban Development Agency had allocated more than $630 million in damage relief through August 1994 with approximately $200 million allocated for rental subsidies, $250 million to assist with affordable housing and community development efforts, and $180 million to assist with apartment rehabilitation (Los Angeles Times, 1994d). Also, the

American Red Cross and the Salvation Army made various forms of material and financial aid available to effected households. The state of California has a natural Disaster Assistance program that provides supplemental funds to households which had losses that were not covered by other assistance programs.

For mobile homeowners who suffered damage to their residences, the Governor's Office of Emergency Service implemented a Minimal Mobile Home Repair Program that offers assistance for repair work and installation of seismic bracing. Work is being done on approximately 3,600 mobile homes for which homeowners applied for the program (FEMA, 1994). Seismic bracing is regarded as the most significant safety measure in keeping mobile homes upright in the event of strong earthquakes.

Business and Other Economic Impacts

A number of Southern California businesses experienced earthquake related-damage and disruption. As of August 11, the Small Business Administration had issued 507,020 loan applications to businesses that reported physical losses and experienced economic impact as a result of the earthquake (Skowbo, 1994). The application deadline for the Administration's disaster loan program for business owners was September 16.

On June 23, the President made available an additional $46 million to the Departments of Commerce, Interior, Health and Human Services, and Housing and Urban Development to further assist in recovery efforts. The package includes $30 million for viable businesses that do not qualify for Small Business Administration assistance. The funds will be used to provide grants to not-for-profit community development organizations and other institutions, which will then aid businesses in restructuring their debt so they can qualify for Small Business Administration assistance (FEMA, 1994).

The California Employment Development Department received approximately $6 million for disaster unemployment assistance. This fund provides weekly benefit payments to those out of work due to the earthquake, including self-employed persons and others not normally covered under regular unemployment insurance programs (FEMA, 1994).

A number of other programs are providing assistance to public infrastructure and facilities, transportation, and education that suffered losses in the earthquake. FEMA has allocated more than $714 million to help rebuild damaged public facilities and reimburse other eligible costs incurred by local and state agencies; the state has pledged to match 10% of the funding. Also, the Federal Highway Administration initially authorized payment of $243 million for freeway, highway and bridge repairs; additional financial aid was expected to be granted. As of July 1994, the Department of Education has been awarded $85 million to the Los Angeles Unified School District for emergency funds not related to structural damage. The funding covers day-care programs, transportation, food services, counseling and supplies.

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APPENDIX C

SITE SELECTION STUDY

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EVALUATION OF POTENTIAL ALTERNATIVE LOCATIONS TO THE PROPOSED ELSMERE CANYON SOLID WASTE MANAGEMENT FACILITY

July 7, 1992

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A. INTRODUCTION

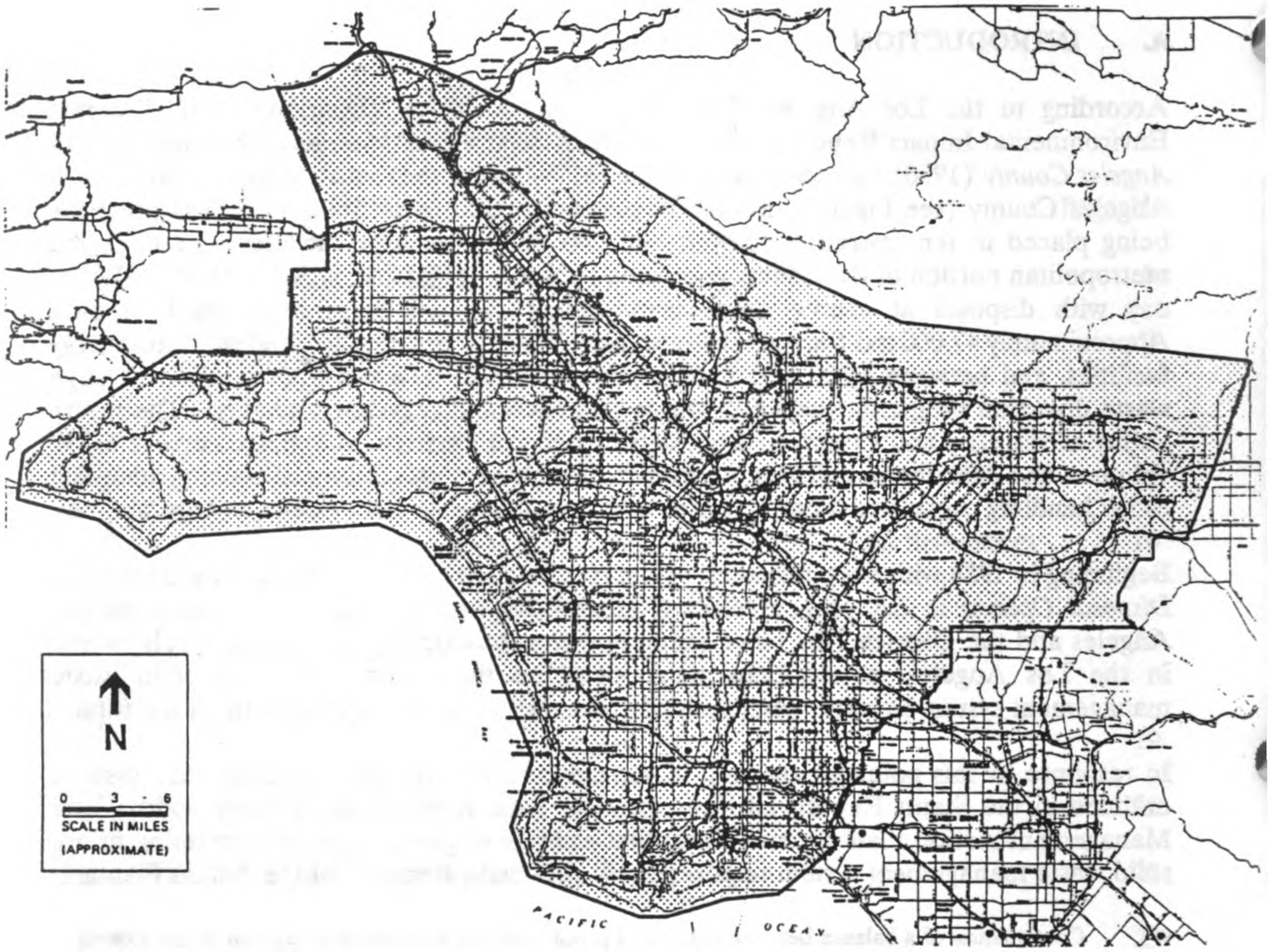
According to the Los Angeles County Sanitation Districts' (Districts) Draft Program Environmental Impact Report (PEIR) "*Integrated Solid Waste Management System for Los Angeles County*"(1990), municipal solid waste (MSW) from the metropolitan portion of Los Angeles County (see Figure 1 for the boundaries of the metropolitan area) is presently being placed in ten operating landfills and two waste-to-energy facilities. In 1990, the metropolitan portion of the County generated between 52,000 and 59,500 tons of MSW per day with disposal at county waste management facilities six days a week (tpd-6). Approximately 47,000 tpd-6 are presently being delivered to the landfills and waste-to-energy facilities, and between 5,000 and 12,500 tpd-6 are being diverted from landfills through waste diversion programs, including source reduction and recycling activities. The future ability of the City and County of Los Angeles and the Districts to manage current MSW volumes, and even larger volumes of MSW in the future, depends on maintaining adequate MSW handling capacity in landfills, waste diversion programs, and waste-to-energy facilities.

Beginning in 1988 with the publication of a study titled "*Solid Waste Management Status and Disposal Options in Los Angeles County*" (Status Report), the City and County of Los Angeles and the Districts (the three agencies with responsibility for managing solid waste in the Los Angeles metropolitan area) identified the potential for the solid waste management system to experience a shortfall in MSW management capacity in the future.

In response to this potential shortfall in capacity in the solid waste management system, outlined in the Status Report, all three agencies have adopted the "County Solid Waste Management Action Plan" (Action Plan) that establishes general goals for meeting future solid waste management system requirements. The main elements of the Action Plan are:

- Continuation of a balance between public and private waste management operations in the County.
- Maximize recycling County-wide.
- Support expansion of existing landfills to the maximum extent environmentally and technically feasible.
- Develop fifty (50) years of new permitted landfill capacity as a public resource permitted for use and protected from encroachment by incompatible land uses.
- Perform detailed studies necessary for permitting, and secure purchase options as appropriate, for potential new landfills at Blind Canyon, Browns Canyon, Elsmere Canyon, Mission/Rustic-Sullivan Canyons, Towsley Canyon, and Toyon II.

One element of the Action Plan outlined is the development of new permitted landfill capacity, i.e., new MSW landfills at locations different than the ten existing landfill locations that presently serve the Los Angeles metropolitan area (see Figure 2). The examination of



ALTERNATE SITE STUDY AREA

Source: Sanitation Districts of Los Angeles County, April 1988

FIGURE 1

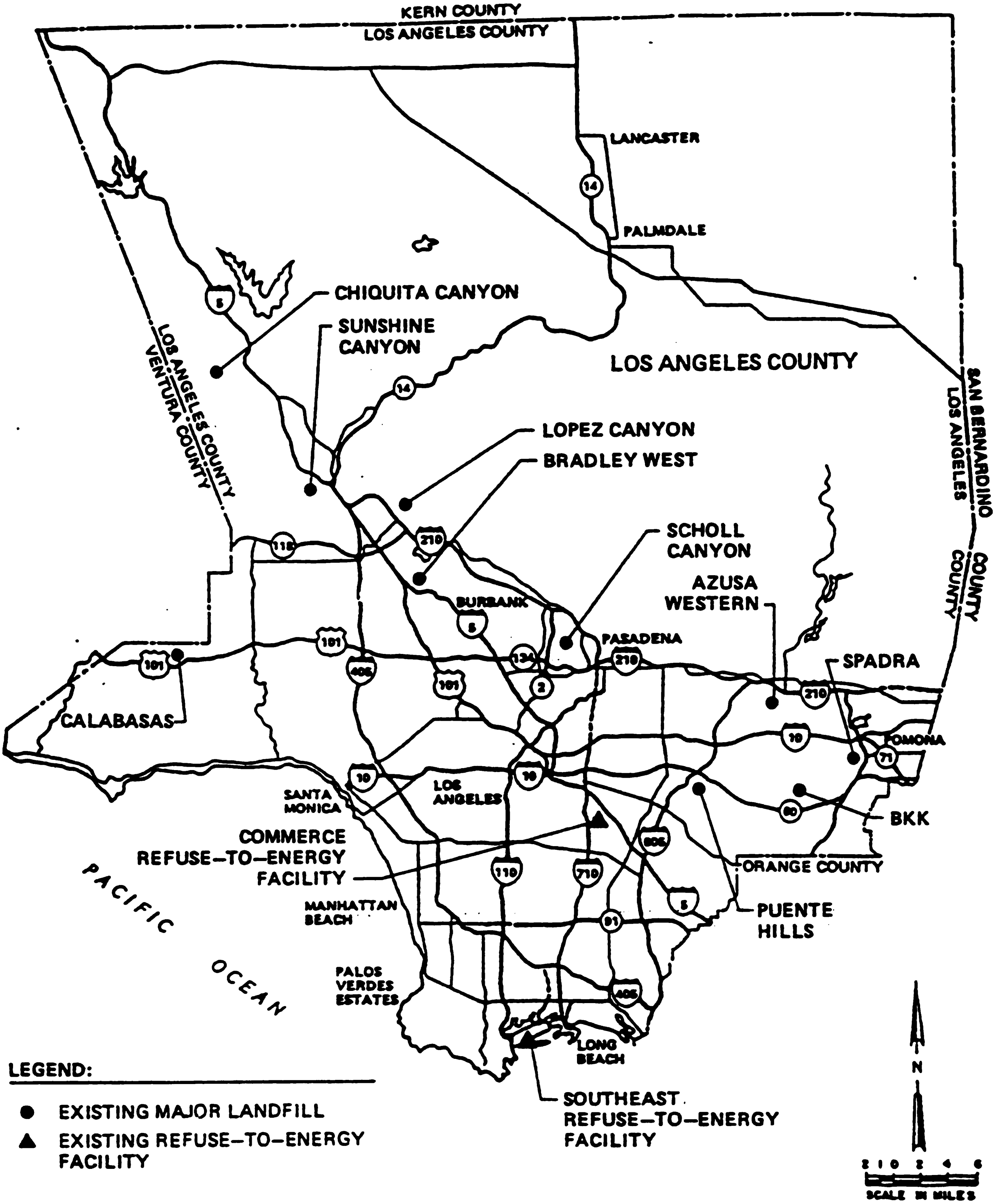
alternative locations that can provide "50 years of new permitted landfill capacity as a public resource permitted for use and protected from encroachment by incompatible land uses" was addressed in the Districts' PEIR. An examination of such alternative locations is also an essential component of the Elsmere Canyon Solid Waste Management Facility Environmental Impact Report/Environmental Impact Statement (Elsmere EIR/EIS).

The PEIR evaluates 101 potential landfill sites that were identified by the Districts as potential alternative landfill locations to serve the County's metropolitan area. This evaluation is presented in a summary manner in the PEIR. Of the 101 sites referenced in the study, ninety-one sites were determined to have "critical deficiencies" and were rejected from further consideration as suitable locations for a regional landfill to serve the metropolitan area. The ten remaining sites were identified as having no critical deficiencies and were evaluated in the PEIR as alternative landfill locations. The PEIR references a 1987 "Preliminary Alternative Site Study" (1987 Study) which was prepared as part of the Status Report document published in 1988 as the technical basis for rejecting the 91 sites and consideration of ten (10) sites.

However, the conclusions presented in these two summary discussions of alternative locations (the 1987 Study and the PEIR) do not provide any clear reference to the data that substantiates the basis for "critical deficiencies" evaluation of the 101 sites. Further, there is no information provided regarding other potential alternative regional landfill locations within the area of concern, i.e. the Los Angeles metropolitan area.

As part of the alternative site evaluation for the Elsmere EIR/EIS, the Forest Service and Los Angeles County concluded that these 101 alternative locations should be reevaluated to independently substantiate the conclusions presented in the Districts' 1987 and 1990 documents. The Forest Service and County also decided that an independent examination be conducted to determine whether any other alternative locations exist within the metropolitan area that should be considered as potential regional landfill sites. The boundaries of the metropolitan area alternate regional landfill site study area are shown in Figure 2.

The following sections of this document: 1) examine the context of the original site evaluations and the methodology that the Districts used in reaching conclusions regarding the 101 alternative locations; 2) verify the conclusions reached in previous studies by conducting a current review of each site and comparing it with the previous conducted review by the Districts; and 3) present an analysis of an additional 44 sites identified as part of this independent review of potential regional landfill locations within the study area shown in Figure 2. Based on the conclusions reached in this document, alternative locations within the study area that are considered potentially viable regional landfill sites will be identified.



LOCATIONS OF THE TEN MAJOR LOS ANGELES METROPOLITAN AREA LANDFILLS AND REFUSE TO ENERGY FACILITIES

Source: Sanitation Districts of Los Angeles County, April 1989

FIGURE 2

B. 101 ALTERNATIVE LOCATIONS

1. History of the Alternative Location Selection and Review Process

a. *Mission Canyon Landfill Environmental Impact Report*

The 101 alternative locations evaluated in the PEIR are discussed in the PEIR text without providing any history of their selection and without a foundation having been established for consideration of each alternative location. In fact, the 101 sites considered in the 1987 Study and the PEIR represent an accumulation of alternative locations considered in previous environmental documents prepared by the Districts beginning in 1980 with the "Mission Canyon Landfill Environmental Impact Report" (CLASD 1980). The 101 alternative locations are summarized in Appendix A which includes the summary evaluation sheets from the 1987 study. Seventy-eight (78) of the alternative locations contained in Appendix A were evaluated in the Mission Canyon EIR. Table 1 of this document contains the list of Mission Canyon alternative locations. How these 78 locations were selected and evaluated is described below.

In 1980, the Districts faced the imminent closure of the Mission Canyon Landfill and prepared an EIR to evaluate the continuation of landfilling activities at the Mission Canyon Landfill located in the Sepulveda Pass area of the Santa Monica Mountains. As part of the Mission Canyon Landfill EIR, the Districts conducted a screening analysis of 78 alternative locations where MSW being delivered to the Mission Canyon Landfill could be landfilled. The analysis of locations as alternatives to continued landfilling at Mission Canyon was restricted to locations within the "wasteshed" as defined in the Mission Canyon Landfill EIR and to locations with suitable geological conditions.

In addition to 71 canyon alternatives in the Santa Monica Mountains, the Districts considered seven additional pit and quarry sites as listed in Table 1. A review of the alternative locations listed in Table 1 revealed that the Districts evaluated almost every major canyon in the Santa Monica Mountains and Baldwin Hills that were located outside of state parks, and within a two-hour driving distance of the defined wasteshed.

The Districts conducted a three part evaluation of each of the 78 alternative locations. An initial screening process consisted of determining the geologic suitability and obvious urban conflicts associated with each alternative. The Districts used the following initial screening criterion as the basis for rejecting alternative locations subject to urbanization:

> *Interference with existing use was also utilized as an initial screening parameter. Urbanization of the area considered for filling was regarded as a disqualifying feature (i.e. housing that occupies canyon bottoms). On-site reservoirs, site-centered paved public streets, and existing park use also precluded an area from further consideration.*

TABLE 1

SOUTHSIDE CANYONS		STATUS
1.	Chavez Ravine	Stadium
2.	Stadium Way	Elysian Park
3.	Silver Lake	Reservoir
4.	Aberdeen	Griffith Park
5.	Vermont Canyon	Griffith Park
6.	Brush Canyon	Griffith Park
7.	Canyon Drive	Griffith Park
8.	Fern Dell-Western Canyon	Griffith Park
9.	Holly Canyon	Reservoir
10.	Cahuenga Pass	Freeway-Urban
11.	Outpost Drive	Urban
12.	Runyon Canyon	LISTED
13.	Curson Canyon	LISTED
14.	Nichols Canyon	Urban
15.	Laurel Canyon	Urban/Laurel Cyn. Park
16.	Coldwater Canyon	Urban
17.	Franklin Canyon	Reservoir
18.	Higgins Canyon	LISTED
19.	Peavine Canyon	Urban
20.	Benedict Canyon	Urban
21.	Brown Canyon (Beverly Glen)	Urban
22.	Stone Canyon	Reservoir
23.	Roscomare	Urban
24.	Sepulveda Pass	Freeway-Tributaries Listed
25.	Canyon X (South of Canyon 8)	LISTED
26.	Hogg Canyon	LISTED
27.	Brownfield	LISTED
28.	Mission Canyon	LISTED
29.	Bundy Canyon	LISTED
30.	Kenter Canyon	LISTED
31.	Mandeville Canyon	Urban
32.	Sullivan Canyon	LISTED
33.	Rustic Canyon	LISTED
34.	Rivas Canyon	State Park
35.	Temescal Canyon	State Park
36.	Pulga Canyon	Urban/State Park
37.	Santa Ynes Canyon & tributaries including Trailer Cyn, Quarry Cyn.	
38.	Castelemare (Los Liones)	State Park
39.	Parker Canyon	Urban
40.	Topanga Canyon	Mostly Urban/State Park relevant tributaries listed
41.	Garipito Canyon	LISTED
42.	Santa Maria Canyon	LISTED
43.	Tuna Canyon	County Road Central, No Significant Tributaries
44.	Pena Canyon	LISTED
45.	Piedra Gorda Canyon	LISTED

TABLE 1 (continued)

	NORTH CANYONS	STATUS
1.	Commonwealth	Griffith Park
2.	Fern Canyon	Griffith Park
3.	Spring Canyon	Griffith Park
4.	Holly Canyon	Griffith Park
5.	"Boys Camp"	Griffith Park
6.	Toyon Canyon	Griffith Park
7.	Sennet Canyon	Memorial Park
8.	(No Name)	LISTED (as Cahuenga Peak North Slope)
9.	Coyote Canyon	Urban
10.	Cahuenga Pass	Freeway-Urban
11.	Laurel Canyon	Urban
12.	Woodhill	Urban
13.	Fryman-Iredell	Urban
14.	Coldwater Canyon	Urban
15.	Dixie Canyon	Urban
16.	North Benedict Canyons	LISTED
17.	Stone Canyon	Urban
18.	Sepulveda Pass	Freeway-No Significant Tributaries
19.	Ballina	Urban
20.	Encino Creek (Havenhurst)	Urban
21.	White Oak	Reservoir
22.	Caballero Canyon (Reseda)	LISTED
23.	Van Alden	Urban
24.	Corbin	LISTED
25.	Kelvin	LISTED
26.	Canoga	Urban

Note: Separate lists of canyons south of the ridge of the Santa Monica Mountains (southside) and north of the ridge (northside) have been compiled. Canyons are listed East to West. Canyons designated "LISTED" are carried forward to the second screening.

PITS & QUARRIES SURVEYED

PITS

OWNER/OPERATOR	TYPE	USGS QUAD	STATUS
Chandler's Palos Verdes 26311 Narbonne, Lomita	Sand/Gravel	Torrance	Class III Landfill
Conrock Sun Valley Plant 11401 Tuxford	Gravel	Van Nuys	Active
Artesia Boulevard Gardena	Clay	Torrance	Completed Landfill Prop. Energy Watson Rec. Facility

QUARRIES

OWNER/OPERATOR	TYPE	USGS QUAD	STATUS
Mid City Granite	Decomposed Granite	Hollywood	Active 3rd yr. of 5 yr. lease
City of L.A. Griffith Park	Rock for L.A. Breadwater	Hollywood	Inactive
Trailer Canyon Quarry Unknown	Sandstone	Topanga	Active (semi)
Santa Ynez Quarry Dept. of Water and Power	Sandstone	Topanga	Reservoir

Of the original 78 sites, 24 passed the initial screening evaluation conducted by the Districts. Table 1 identifies those alternative locations that were "LISTED" for further review. The 54 alternative locations eliminated by the initial screening process are discussed in Appendix B.

The 24 alternative locations that passed the initial screening review in the Mission Canyon Landfill EIR were subjected to a more intensive screening review to determine whether they had critical deficiencies that would disqualify them from further consideration. In order to create an objective review process, the District's Solid Waste Department staff developed a list of evaluation criteria. This list was reviewed, modified and approved by a subcommittee of the District's Citizen Solid Waste Environmental Advisory Committee (CSWEAC). As stated in the Mission Canyon Landfill EIR:

> *The criteria developed fell into three groups: 1) regional service values - having to do with the effectiveness of disposal operations; 2) local urban values - having to do with landfill impacts on adjacent urban uses; 3) conservation values - having to do with preservation of the natural land and the conservation of resources.*

These criteria are reproduced as Table 2 in this document.

After evaluating the 24 alternative locations that passed the initial screening evaluation, the Districts concluded that 18 locations had one or more critical deficiencies which made them unacceptable for further consideration as landfill sites. The specific critical deficiencies identified by the Districts in the Mission Canyon Landfill EIR for the 18 locations are shown in Figure 3 of this document and described in Appendix C to this document. The 18 locations eliminated during the second screening process are discussed in the individual site evaluations presented in Appendix B.

Six alternative locations were judged by the Districts to have no critical deficiencies in 1980 Mission Canyon Landfill EIR (although subsequent evaluations identified critical deficiencies for some of these six sites). These six sites (including the Mission Canyon Landfill site) passed the second screening evaluation and were evaluated comparatively in the Mission Canyon Landfill EIR. Figures 4 and 5 of this document show the relative ranking of these six sites based on weighted rankings and a sensitivity analysis performed by the Districts and CSWEAC. Each of the evaluation criteria were given weights (relative importance of each criteria) and each site was evaluated by the CSWEAC subcommittee and Districts' staff.

The six sites were ranked in the Mission Canyon Landfill EIR with respect to their relative suitability for a MSW landfill to serve the wasteshed of the western Los Angeles metropolitan area. The site rankings were:

1. Mission Canyon
2. Peña Canyon
3. Bundy Canyon
4. Rustic Canyon
5. Brownfield Canyon
6. Caballero Canyon

TABLE 2

ALTERNATE SITE EVALUATION CRITERIA CODES

SERVICE (Disposal Service Criteria)

S 1. ACQUIRABILITY - Time to acquire and cost of acquisition.

2. HAUL TIME - Typical time to haul to the site by collection vehicles.

3. GEOLOGY - Geologic formations and seismicity with respect to containment and drainage; availability of off-site storm drains.

4. ACCESS - Off highway haul route, considering length, width, grade, ad construction required.

5. CAPACITY AND COVER - Volume available for disposal; adequate area for operations; sufficient cover soil.

6. PREPARATION - Preparation required prior to disposal, considering grading, barriers, berms, and water supply.

7. ENERGY USE - By collection vehicles and associated disposal operations.

URBAN USES (Adjacent Urban Uses Criteria)

U 1. ISOLATION - From homes, schools, churches, and the like.

2. NEIGHBORHOOD - Compatibility with zoning, planning, and adjacent property.

3. MITIGATIBILITY - Of adverse impacts (odor, methane gas, view disturbance, noise, vectors, dust) on adjacent urban uses.

4. TRAFFIC - Impact of disposal operations on traffic flow along streets and freeways in the area.

5. USES DISPLACED - Number and community value of any improvements on the site that landfilling would eliminate.

CONSERVATION - (Conservation and end use criteria)

C 1. RESTORABILITY - Amenability of site to restoration for end use; preserving, restoring and/or buffering habitat, wildlife corridors, watershed and viewshed.

2. ECOLOGY - Compatibility of natural values in the area in its present state with landfilling, considering existing disturbance.

3. RECREATION - Compatibility of outdoor recreation on the site, and in the region including the site, with landfilling -- considering any difficulty of development for recreation that landfilling may create or remove.

4. OPEN SPACE PLANS - Degree of compatibility with regulations and plans designed to preserve open space.

5. MATERIALS RECOVERY - Character and location of site with regard to supporting materials recovery from waste.

6. ENERGY EXTRACTION - Character and location of site with regard to supporting energy recovery from waste.

7. AIR QUALITY - Pollution from collection vehicles and on-site equipment.

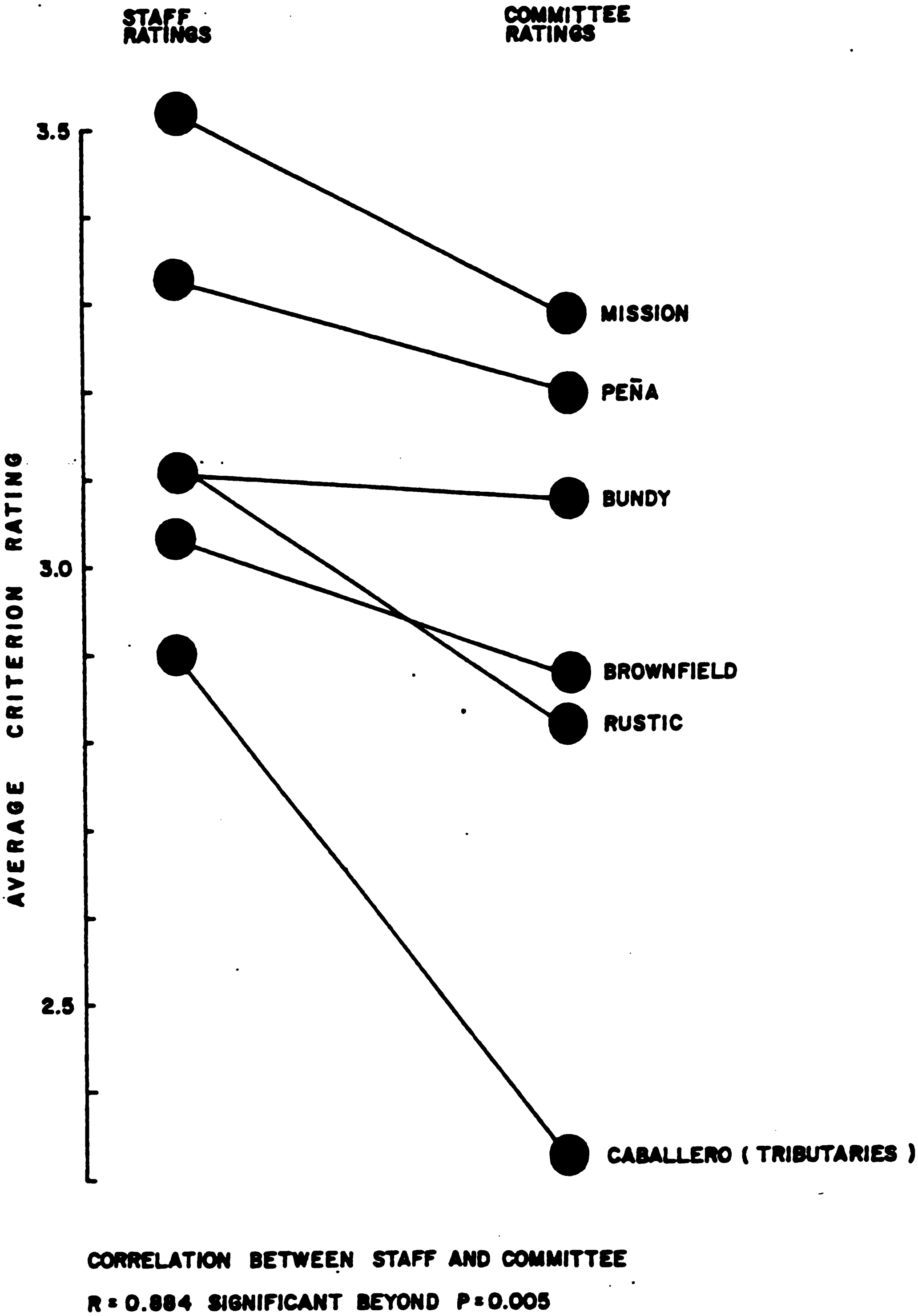
8. ANTI-LITTER - Character and location of the site with regard to reducing littering and indiscriminate dumping.

CRITERIA	Baldwin Hills	Bundy Canyon	Brownfield Canyon	Caballero Canyon (tributary)	Cahuenga Peak, N. slope	Canyon X	Chandler Pit	Corbin Canyon	Curson Canyon	Garapito Canyon	Higgins Canyon	Hogg Canyon	Kelvin Canyon	Kenter Canyon	La Questa Lado	Mission Canyon	Naval Reserve	North Benedict Canyon	Piedra Gorda Canyon	Pena Canyon	Runyan Canyon	Rustic Canyon	Santa Maria Canyon	Sullivan Canyon
Service																								
Acquirability	●																							●
Haultime							●			●					●		●						●	
Geology							●																	
Access								●	●	●	●		●	●				●	●		●		●	
Capacity and Cover					●	●									●									
Preparation	●																●							●
Energy Use																								
Urban Uses																								
Isolation																								
Neighborhood																								
Mitigability								●			●	●												
Traffic																								
Uses Displaced	●																							
Conservation																								
Restorability																								
Ecology														●										
Recreation																								
Open Space Plans											●							●			●			
Materials Recovery																								
Energy Recovery																								
Air Quality																								
Anti-litter																								
Number of Critical Deficiencies	3	-	-	-	1	1	2	2	1	2	3	1	1	2	2	-	2	2	1	-	2	-	2	2

POTENTIAL ALTERNATIVE SITES WITH CRITICAL DEFICIENCIES

Source: Mission Canyon Landfill Final EIR

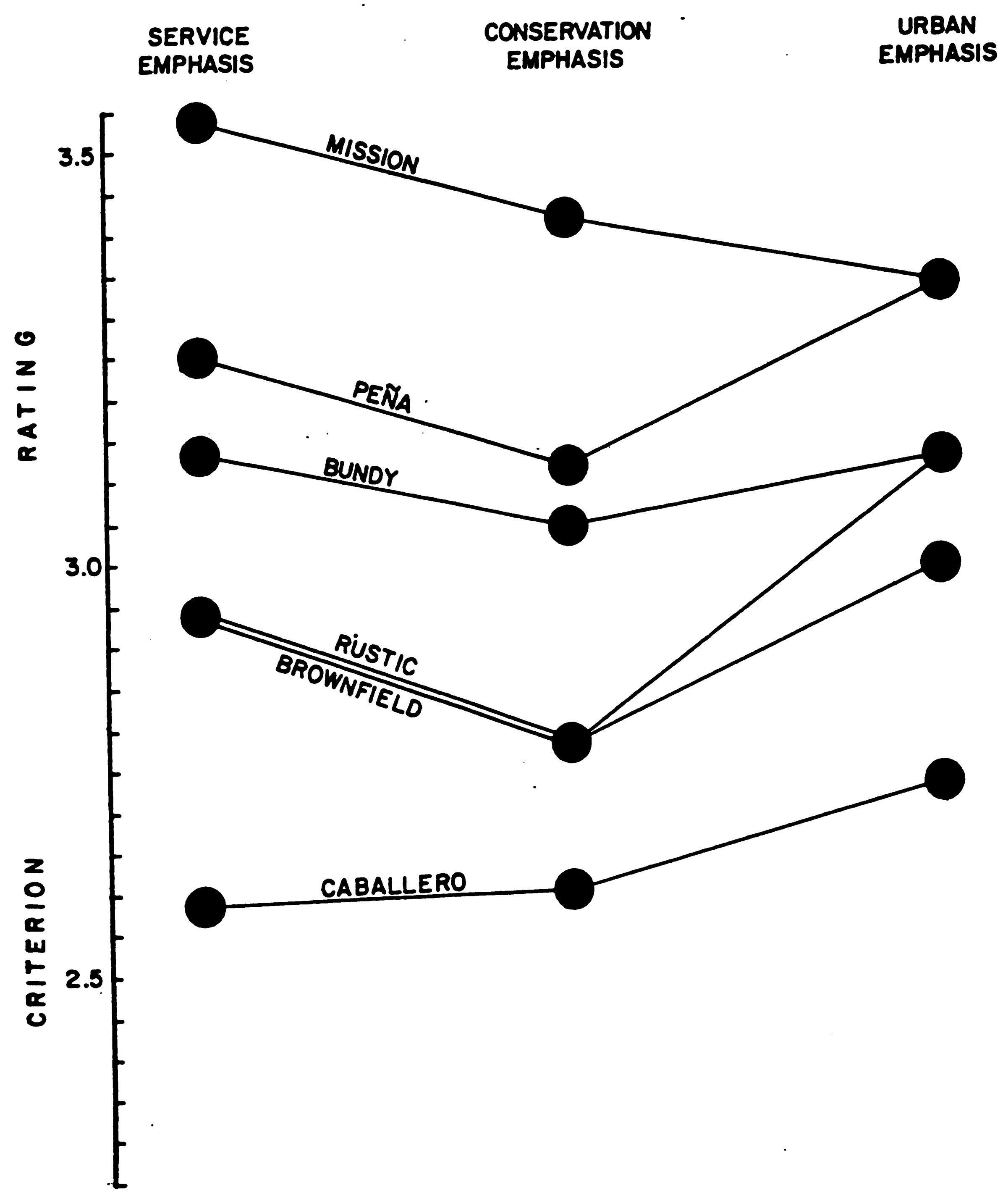
FIGURE 3



ALTERNATE SITES WEIGHTED RATINGS

Source: Mission Canyon Landfill
Final EIR

FIGURE 4



ALTERNATE SITE RATINGS
SENSITIVITY ANALYSIS

Source: Mission Canyon Landfill
Final EIR

FIGURE 5

Figure 4 depicts the rankings based on the weighting for the criteria listed in Table 2 and Figure 5 illustrates the ranking, which remains the same, after performing a "sensitivity analysis" to emphasize each value rating identified by the CSWEAC (see Page 304, Mission Canyon Landfill EIR). The six locations evaluated in the final rating process are discussed in the individual site evaluations presented in Appendix B.

In summary, the Mission Canyon Landfill EIR identified a total of 78 alternative locations to the proposed Mission Canyon Landfill site. Of the 78 sites 54 were eliminated from further consideration based primarily upon conflicts (incompatibilities) with urban land uses on the site itself or along the access route. Of the remaining 24 sites, 18 were rejected based on critical deficiencies identified during the second, more-detailed screening process (Figure 3 and Appendix C). The final six sites were given a detailed comparative evaluation which concluded that the Mission Canyon Landfill was the best landfill location for the western Los Angeles metropolitan area wasteshed among the six locations considered as suitable landfill sites in 1980. Individual reviews of all 78 sites are provided in Appendix B to this document. Appendix B includes a summary of the Districts 1980 review and an updated evaluation of the suitability of each site to serve as a regional landfill for the Los Angeles metropolitan area.

b. Puente Hills Landfill Environmental Impact Report

The second set of alternative locations included in the 101 sites identified in the PEIR were selected and evaluated during the preparation of the Puente Hills Landfill EIR (January 1983). The project being considered in the Puente Hills Landfill EIR was the continuation and expansion of the Puente Hills Landfill. Alternative locations within the Puente Hills Landfill wasteshed were evaluated as part of the EIR process. A total of 18 sites were evaluated as alternative locations to the Puente Hills Landfill. These sites are listed in Table 3 of this document. In conjunction with the 78 sites evaluated in the Mission Canyon Landfill EIR, these two EIRs evaluated 96 of the 101 locations discussed in the PEIR.

As in the case of the Mission Canyon Landfill alternatives, the Districts conducted a three phase evaluation of each alternative location identified in the Puente Hills Landfill EIR. The initial screening evaluation in the Puente Hills Landfill EIR was conducted in the same manner as the evaluation in the Mission Canyon Landfill EIR. Of the original 18 sites, 12 passed the initial screening evaluation conducted by the Districts. Table 4 lists the 12 alternative locations that passed the initial screening and that were evaluated in the Districts second phase screening process. The six alternative locations eliminated by the initial screening process are discussed in the individual site evaluations in Appendix B.

The 12 alternative locations that passed the initial screening review in the Puente Hills Landfill EIR were given a more intensive screening review to determine whether they had critical deficiencies that would disqualify them from further consideration. The Districts applied the same criteria used in the Mission Canyon Landfill EIR (see Table 2) to these 12 alternative locations. After evaluating these 12 locations, the Districts concluded that

TABLE 3

ALTERNATIVE SITES EVALUATED IN THE PUENTE HILLS LANDFILL EIR

1. Fullerton Road (Canyon 550)
2. Rincon de la Brea (Canyon 549)
3. Tonner Canyon (Canyon 574)
4. Tres Hermanos Canyon
5. Phillips Ranch (Canyon 546)
6. Diamond Bar (Canyon 545)
7. San Dimas Canyon (Canyon 502)
8. San Jose Hills (Canyon 508)
9. Morgan Canyon (Canyon 453a)
10. Harrow Canyon (Canyon 453b)
11. Englewild Canyon (Canyon 453c)
12. Sycamore Canyon
13. Ham Canyon (Canyon 454)
14. Beatty Canyon (Canyon 452)
15. Eaton Canyon (Canyon 405)
16. Clamshell Canyon
17. Fish Canyon
18. Sierra Madre Canyon (Little Santa Anita Canyon)

TABLE 4

POTENTIAL ALTERNATE LANDFILL SITES

PASSING THE INITIAL SCREENING

	Location
A. Replacement Alternate Sites	
1. Rincon De La Brea	Immediately west of the 57 freeway and south of Brea Canyon Road.
2. Fullerton Road	Immediately north of the Orange County line and west of the 57 freeway.
3. Rancho Palos Verdes	North of Palos Verdes Drive South and south of Hawthorne Blvd.
4. Sycamore Canyon	East of Workman Mill Raod and south of Rose Hills Memorial Park.
5. Baldwin Hills	East of La Cienega Blvd, south of Coliseum Street, and west of La Brea Ave.
B. Partial Alternate Sites	
1. Clamshell Canyon	In Angeles National Forest, east of Santa Anita Avenue, north of Monrovia.
2. Sierra Madre	In Angeles National Forest, west of Santa Anita Ave, north of Sierra Madre.
3. Eaton Canyon	Portions in Pasadena, portions in Angeles National Forest, east of Altadena Drive.
4. Fish Canyon	In Angeles National Forest, north of Hunnington Drive and east of Fish Canyon Road.
5. San Jose Hills	South of 10 freeway east of Grand Avenue, north of Temple Avenue.
6. Tres Hermanos Canyon	East of 57 freeway, wouth of Golden Springs Road, north of Pathfinder Road.
7. Tonner Canyon	South easternmost portion of Los Angeles County.

Note: The potential replacement and partial alternative sites listed on this table were then subjected to a second screening procedure which is more detailed then the initial screening.

nine locations had one or more critical deficiencies which made them unacceptable for further consideration as alternative landfill sites for the Puente Hills Landfill wasteshed. The specific critical deficiencies identified by the Districts in the Puente Hills Landfill EIR are shown in Table 5 and 6 of this document and are discussed in Appendix D. The nine locations eliminated during the second screening process are discussed in the individual site evaluations presented in Appendix B.

Three of the alternative locations evaluated in the Puente Hills Landfill EIR were judged to have no critical deficiencies in 1980 (during the 1987 review one of these three alternative locations, Sierra Madre, was evaluated as having critical deficiencies) and passed the second screening evaluation. The three sites were: Puente Hills Landfill, Fish Canyon and Sierra Madre Canyon. These locations were comparatively evaluated in the EIR to determine their relative suitability for a landfill to serve the wasteshed for the Puente Hills portion of the Los Angeles metropolitan area. The site ratings are illustrated in Table 7. The three alternative locations were ranked as follows in the Puente Hills Landfill EIR using the same process as outlined in the Mission Canyon Landfill EIR:

1. Puente Hills
2. Fish Canyon
3. Sierra Madre Canyon

These three locations are discussed in the individual site evaluations in Appendix B.

In summary, the Puente Hills Landfill EIR identified a total of 18 alternative locations to the proposed Puente Hills Landfill site. Of the 18 sites, six were eliminated from further consideration based primarily upon conflicts (incompatibilities) with urban land uses on the site itself or along the access route. Of the remaining 12 sites, nine were rejected based on critical deficiencies identified during the second, more-detailed screening process (Tables 5 and 6 and Appendix D). The final three sites underwent a comparative evaluation which concluded that the Puente Hills Landfill was the best landfill location for the wasteshed among the final three locations considered. The individual reviews of all 18 alternative locations are provided in Appendix B to this document.

c. *Spadra Landfill & Resource Conservation Project Environmental Impact Report*

The final set of the original 101 alternative locations was identified and evaluated during the preparation of the Spadra Landfill & Resource Conservation Project EIR (January 1985). The project being considered in the Spadra Landfill EIR was the continuation and expansion of the landfill. Alternative locations in the Spadra Landfill wasteshed (which overlapped with the Puente Hills Landfill wasteshed) were evaluated as part of the EIR process. A total of nine locations, including the Spadra Landfill site, were evaluated as alternative locations to the Spadra Landfill. These sites are listed in Table 8 of this document.

TABLE 5

SUMMARY OF CRITICAL DEFICIENCY EVALUATION - REPLACEMENT ALTERNATE SITES

Site	Type of Critical Deficiency			
	Service	Urban Uses	Conservation	Total No. Critical Deficiencies
Rincon De La Brea	None	None	Restorability Ecology	2
Fullerton Road	Preparation	Uses Displaced	Restorability Ecology	4
Puente Hills	None	None	None	0
Rancho Palos Verdes	Access Capacity and Cover	Traffic	None	3
Syamore Canyon	None	None	Restorability Ecology	2
Baldwin Hills	Aquirability Capacity and Cover Preparation	Uses Displaced	None	4

Note: See Table V-4 for a detailed explanation of the evaluation criteria listed under each category (Service, Urban Uses, and Conservation). All potential replacement sites for Puente Hills were eliminated from further consideration because of the critical deficiencies noted above.

TABLE 6

SUMMARY OF CRITICAL DEFICIENCY EVALUATION
PARTIAL ALTERNATE LANDFILL SITES

Site	Type of Critical Deficiency			
	Service	Urban Uses	Conservation[1]	Total No. Critical Deficiencies
Clamshell Canyon	Access	Traffic	None	2
Sierra Madre	None	None	None	0
Eaton Canyon	Access	Traffic	None	2
Fish Canyon	None	None	None	0
San Jose Hills	None	None	Restorability Ecology	2
Tres Hermanos Canyon	None	Neighborhood	None	1
Tonner Canyon	None	None	Restorability Ecology	2

1. See Table V-4 for a detailed explanation of the evaluation criteria listed under these categories (Service, Urban Uses, and Conservation).

TABLE 7

ALTERNATIVE SITE RATING

CRITERIA	CRITERION RATING		
	PUENTE HILLS	FISH CANYON	SIERRA MADRE
SERVICE			
Geology	4	4 (1.2)**	4 (1.2)**
Acquirability	5	3 (0.9)**	3 (0.9)**
Haul Time	5	3 (0.9)**	3 (0.9)**
Access	5	3 (0.9)**	4 (1.2)**
Capacity / Cover	5	2 (0.8)**	2 (0.6)**
Preparation	4	3 (0.9)**	4 (1.2)**
Energy Use	5	3 (0.9)**	3 (0.9)**
URBAN USES			
Isolation	4	5	4
Neighborhood	4	5	4
Mitigatibility	4	5	4
Traffic	5	2	3
Uses Displaced	5	3	4
CONSERVATION			
Restorability	4	4	5
Ecology	4	3	3
Recreation	4	4	4
Open Space Plans	4	4	4
Material Recovery	5	4	4
Energy Recovery	5	4	4
Air Quality	5	4	3
Anti Litter	4	4	3
Overall Rating *	443	363 (292)**	356 (289)**

* Overall Rating = Σ(Criterion Weighting) x (Criterion Rating)

5 = Excellent, 4 = Good, 3 = Fair, 2 = Poor, 1 = Very Poor

** Note: The Overall Ratings of Fish Canyon and Sierra Madre were penalized since these sites are only partial alternatives and would not completely prevent No Project impacts. The penalty was applied only to the Service Criteria ratings and was in proportion to the estimated rate of disposal. Fish Canyon and Sierra Madre could expect to receive (30% of the Puente Hills waste shed).

TABLE 8

COMPOSITE ALTERNATIVE SITE RATING

ALTERNATE SITE	TOTAL RATING
Spadra	440
#502 (San Dimas Canyon)	395
#454 (Ham Canyon)	352
#453a (Morgan Canyon)	352
#510 Gail Canyon	349
#512 Burbank Canyon	349
#453c (Englewild Canyon)	305
#453b (Harrow Canyon)	299
#452 Benty Canyon	265

Note: 500 is the maximum total rating that a site could receive.

Of these nine alternative locations, four were originally considered in the Puente Hills Landfill EIR. Five new sites were considered in the Spadra Landfill EIR. These five new alternative locations, combined with the 96 previously listed sites, comprise the 101 sites considered in the PEIR. The five new locations considered in the Spadra Landfill EIR were Spadra, San Dimas Canyon, Englewild Canyon, Gail Canyon, and Burbank Canyon (Canyons 453c, 502, 510 and 512, respectively, on Table 8). All nine sites passed the first two screening tests applied by the Districts and were comparatively evaluated. Table 9 shows the ratings based on the comparative evaluation of criteria contained in Table 2. The Spadra Landfill was identified as the best landfill location for the wasteshed among the nine locations. The individual reviews of all nine alternative locations are provided in Appendix B.

d. *The 1987 Preliminary Alternative Site Study*

In the 1987 Study the Districts evaluated 98 alternative locations, that included reevaluation of all of the above locations, as well as six additional alternative locations. Three of the alternatives originally evaluated were existing landfills, Mission Canyon, Puente Hills and Spadra and they were not reevaluated in the 1987 study. The six additional locations included the following: Blind Canyon, Browns Canyon, Elsmere Canyon, La Tuna Canyon, Towsley Canyon and Toyon Canyon II. These additional locations were added at the request of private individuals or of one of the three agencies providing solid waste management service within the Los Angeles metropolitan area (i.e. City, County or Sanitation Districts). The total number of sites brought forward in the 1987 Study was 101 sites.

The Districts 1987 Study examined all 101 alternative locations as possible sites for a new regional landfill to serve the Los Angeles metropolitan area. As previously noted, these locations are listed in Appendix A along with and the Districts' evaluation shown of the sites from the 1987 Study. In the 1987 evaluation by the Districts, several of the original evaluations were modified and 91 of the original 101 alternative locations were identified as having critical deficiencies that precluded them from being considered as a regional landfill site. The remaining ten locations that the Districts determined were suitable for comparative evaluation as regional landfill sites in 1987 are shown in Figure 6.

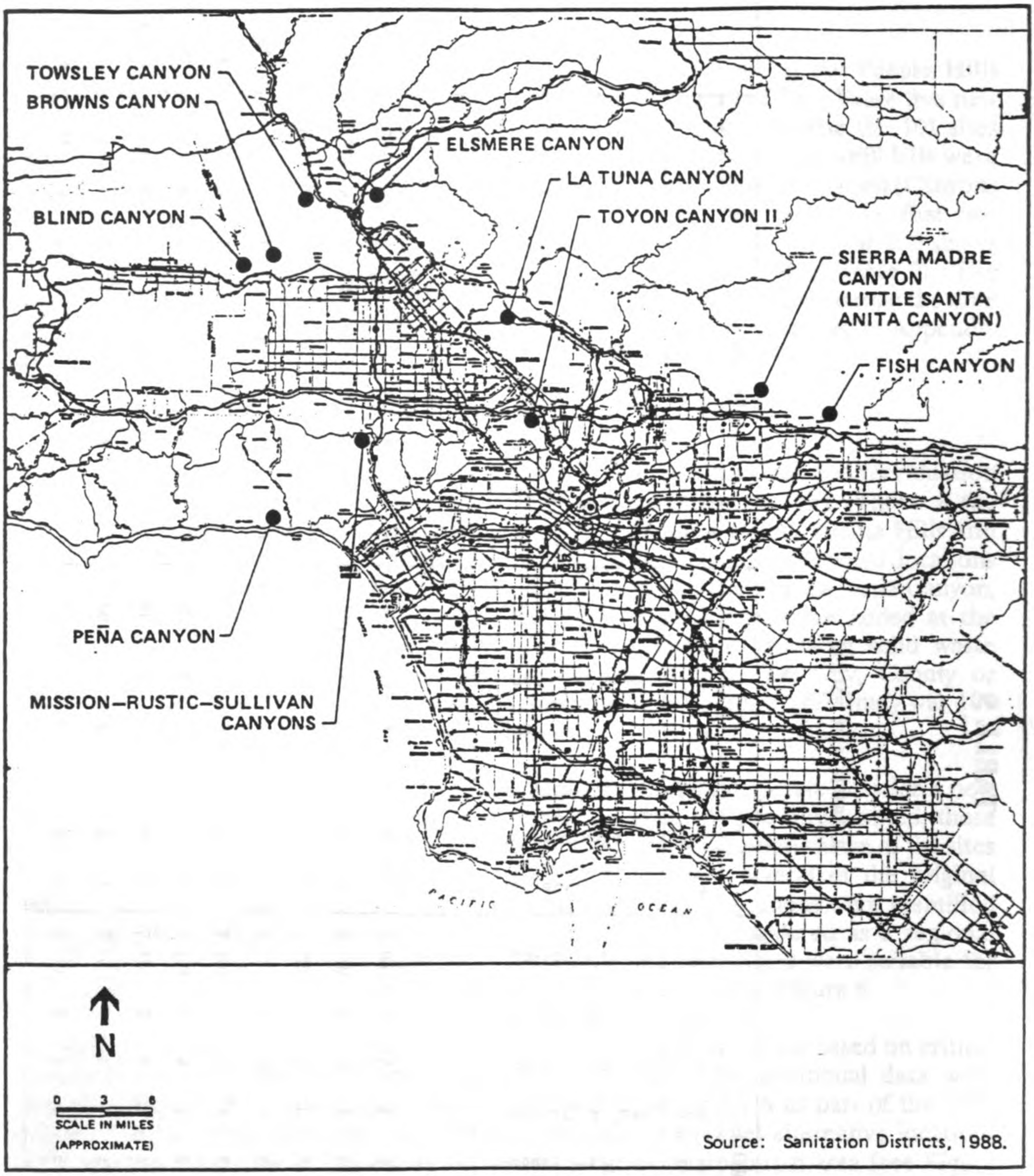
In summary, 91 alternative locations were eliminated from further review based on critical deficiencies in the 1987 Preliminary Alternative Site Study. No additional data were published beyond the summary information contained in Appendix A as part of the 1987 Study. The 1987 Study identified the following ten sites as potential alternative locations for a regional landfill to be located within the Los Angeles metropolitan area (see Figure 6):

1. Blind Canyon
2. Browns Canyon
3. Elsmere Canyon

TABLE 9

ALTERNATE SITE RATINGS

	SERVICE								USES						CONSERVATION									
Criterion Weight	5.4	6.2	6.2	3.9	4.6	2.6	6.2		7.6	6.2	6.7	5.9	2.5		4.7	5.1	4.2	4.6	3.9	4.2	6.9	1.5		
Criterion	Geology	Acquireability	Haul Time	Access	Capacity & Cove	Preparation	Energy Use	Sub-Total	Isolation	Neighborhood	Mitigability	Traffic	Uses Displaced	Sub-Total	Restorability	Ecology	Recreation	Open Space Plans	Materials Recovery	Energy Recovery	Air Quality	Anti-Litter		
Alternate Site																								
502	4	4	5	4	3	4	5	140.2	3	3	4	4	5	104.3	4	3	4	5	3	4	5	4	142.9	395.4
454	4	3	2	3	4	4	2	105.5	4	5	4	4	5	124.3	5	3	4	4	3	4	2	4	122.3	352.1
452	4	3	1	2	3	3	1	82.0	3	2	3	2	3	74.6	3	3	4	4	4	4	1	3	108.4	265.0
510	4	4	1	3	4	5	1	101.9	5	5	5	4	5	130.6	5	3	4	4	3	3	1	2	108.2	340.7
512	4	4	1	3	4	5	1	101.9	5	5	5	4	5	130.6	5	3	4	4	3	3	1	2	108.2	340.7
453a	4	3	3	3	4	4	3	117.9	4	4	4	3	4	109.7	4	3	4	4	3	4	3	4	124.5	352.1
453b	4	2	2	1	4	4	2	91.5	3	4	3	2	4	89.5	4	3	4	4	3	4	2	4	117.6	298.6
453c	4	3	2	1	4	4	2	97.7	4	3	3	2	4	90.9	4	3	4	4	3	4	2	3	116.1	304.7
Spadra	4	5	5	5	5	4	5	167.5	4	4	4	5	5	124.0	4	4	4	5	3	4	5	4	148	439.5



POTENTIAL LANDFILL SITES WITH NO CRITICAL DEFICIENCIES ASSESSED DURING PRELIMINARY ALTERNATE SITE STUDY

Source: Sanitation Districts of Los Angeles County, 1988

FIGURE 6

4. Fish Canyon
5. La Tuna Canyon
6. Mission-Rustic-Sullivan Canyons
7. Peña Canyon
8. Sierra Madre Canyon (Little Santa Anita Canyon)
9. Towsley Canyon
10. Toyon Canyon II

All 101 sites are shown on Figure 7.

e. 101 Alternative Location Individual Reviews

Individual evaluations of all 101 alternative locations are presented in Appendix B. Each evaluation summarizes the original decision reached by the Districts for each alternative location and provides an updated summary that reevaluates the conclusions presented in the previous studies, including the 1987 Preliminary Alternative Site Study and the PEIR. Based on the findings presented in these individual evaluations, a conclusion is presented regarding whether the alternative location is a potentially viable regional landfill site for the Los Angeles metropolitan area.

Before proceeding with the individual site evaluations, it is necessary to understand how the alternate site evaluation criteria codes (Table 2) have been interpreted for purposes of this evaluation. It is not possible to duplicate precisely the evaluations performed by the Districts and the Advisory Committee when they originally evaluated the 101 alternative locations. In reviewing the 1990 aerial photographs of the 101 sites, it was necessary to apply some interpretive values to the urban criteria in particular (which were the primary critical deficiencies found at most of the alternative locations). The urban use codes are largely subjective and no specific numerical values were developed for each code by the Districts. However, to ensure that the reader understands the interpretation of the urban use codes in the updated individual site evaluations presented below for purposes of the Elsmere alternatives analysis, the following information is provided:

U.1. Isolation

Districts Criteria Code Text: ISOLATION - FROM HOMES, SCHOOLS, CHURCHES, AND THE LIKE

Updated Code Use: As used in reviewing the 1990 aerial photographs, a critical "isolation" deficiency is interpreted to mean that existing land uses (residential, commercial, recreational, etc.) incompatible with landfill activities cannot be isolated from the significant negative effects (odors, visual change, noise, vectors, dust, traffic, etc.) of ongoing landfill operations. Isolation means the ability to control the intrusion of landfill activities to a level of minor change in the community based on the ability to mitigate such activities.

U.2. Neighborhood

Districts Criteria Code Text: NEIGHBORHOOD - COMPATIBILITY WITH ZONING, PLANNING, AND ADJACENT PROPERTY

Updated Code Use: Compatibility with existing neighborhood uses depends upon not introducing activities (such as traffic, noise, fugitive dust, etc.) into a neighborhood that conflict with the ongoing level of human activity or with planned and zoned land uses. A neighborhood is understood to represent more than one residence and is generally used to reflect a small developed area or group of homes at a minimum. A critical "neighborhood" deficiency occurs when the man-made neighborhood character will be substantially altered from its existing pattern of use and activity.

U.3. Mitigability

Districts Criteria Code Text: MITIGATIBILITY - OF ADVERSE IMPACTS (ODOR, METHANE GAS, VIEW DISTURBANCE, NOISE, VECTORS, DUST) ON ADJACENT URBAN USES

Updated Code Use: The term mitigatibility refers to the capability of landfill operators to reduce the effects of installing landfill facilities and conducting ~~landfill activities~~ to a level that conforms with the existing activity at the location. A critical "mitigability" deficiency occurs when, after applying available mitigation, the effect of landfill facility and activity impacts exceeds those that normally occur within a neighborhood or community.

U.4. Traffic

Districts Criteria Code Text: IMPACT OF DISPOSAL OPERATIONS ON TRAFFIC FLOW ALONG STREETS AND FREEWAYS IN THE AREA

Updated Code Use: A critical "traffic" deficiency occurs when a substantial increase in traffic, particularly truck traffic, affects freeways or major arterials where traffic flow is already impacted by existing traffic conditions, or when the addition of refuse truck traffic affects narrow, local roads which pass through residential or recreational areas that do not normally experience such traffic levels.

U.5. Uses Displaced

Districts Criteria Code Text: USES DISPLACED - NUMBER AND COMMUNITY VALUE OF ANY IMPROVEMENTS ON THE SITE THAT LANDFILLING WOULD ELIMINATE

Updated Code Use: A critical "displacement" deficiency occurs when a proposed landfill will cause the forced relocation of major infrastructure uses or a small neighborhood of more than ten residences.

The Service and Conservation Evaluation Criteria Codes (see Table 2) were only used when specific information related to the code was available from published sources, such as the original EIRs (Mission Hills Landfill, Puente Hills Landfill and Spadra Landfill) and the County of Los Angeles General Plan and Elements. These codes did not require interpretation in the same manner as that required for the Urban Uses Codes. Thus, when the County General Plan indicated that an area was designated as a Significant Environmental Area, a regional recreation area, or an area should be retained as permanent open space, the Conservation Codes were utilized. Similarly, when the Districts evaluation indicated that cover material or access were inadequate, this was verified, but not interpreted, from the review of the data base used to reevaluate the 101 sites.

The data base used to conduct the reevaluation and update of the 101 alternative locations consisted of the following materials and activities:

1. U.S. Geological Survey 7.5' and 15' Topographic Maps
2. Regional Geology Maps
3. Copies of the Mission Canyon Landfill, Puente Hills Landfill and Spadra Landfill Final EIRs
4. Integrated Solid Waste management System for Los Angeles County Draft Program EIR (PEIR)
5. Los Angeles County General Plan
6. Thomas Bros. Commercial Street Atlas and Aerial Atlas
7. Los Angeles County Solid Waste Management Plan Triennial Review, Volume I: Nonhazardous Waste, Revision A, August 1985
8. Solid Waste Management Status and Disposal Options in Los Angeles County, February 1988
9. Angeles National Forest Land and Resources Management Plan
10. 1990 Color and B/W Aerial Photographs of all alternative landfill locations
11. Meetings with County of Los Angeles Sanitation Districts staff
12. Field surveys of canyons in the Santa Monica and San Gabriel Mountains

The individual alternative location evaluations for all alternative sites are presented in Appendix B to this document.

C. 44 ADDITIONAL ALTERNATIVE LOCATIONS

At the request of the Forest Service and Los Angeles County, the Los Angeles metropolitan area (see Figure 1) was resurveyed to identify additional potentially viable alternative regional landfill locations. Using USGS topographic maps and the Aerial Atlas of Los Angeles County, the metropolitan area illustrated in Figure 2 was resurveyed for possible regional landfill locations. The first step in screening the metropolitan area for additional potential landfill locations was to identify canyons or locations with sufficient physical volume (a minimum of 20 million tons capacity, or ten years of disposal capacity at 2 million cubic yards disposal per year) to serve as a landfill. This screening effort produced 44 potential alternative regional landfill locations in addition to the 101 locations already evaluated by the Sanitation Districts. Several mining pit and alluvial locations were examined as potential landfill sites to ensure a comprehensive review of viable alternatives.

All 44 sites were then subjected to more detailed evaluation to determine if they had any critical deficiencies using the "Alternate Site Evaluation Criteria Codes" listed in Table 2. The Urban Deficiency Codes were applied in the same manner as outlined on pages 7 and 8 of this document. All codes were applied to the 44 additional locations in the same manner as they were applied for the updated evaluation of the 101 sites discussed in the previous section of this document and presented in Appendix B. The critical deficiency screening process was performed during late-1991 and early-1992 and was based upon review of the materials cited above. The additional 44 sites are also shown on Figure 7. The individual alternative evaluations for the 46 sites are provided in Appendix E.

D. CONCLUSION: VIABLE ALTERNATIVE REGIONAL LANDFILL LOCATIONS IN THE LOS ANGELES METROPOLITAN AREA

Over a ten year period, the Districts examined numerous landfill locations in its efforts to identify potentially viable regional landfill sites. At the request of Los Angeles County and the Forest Service, additional potential sites were examined, including many abandoned sand and gravel pits that would probably not be permittable under current Los Angeles Regional Water Quality Control Board policy. The reevaluation of the original 101 sites considered by the Districts and consideration of an additional 44 sites demonstrates that there are very few remaining sites within the Los Angeles metropolitan study area (defined in Figure 1 of this document) that are isolated, yet accessible, and thus, can serve as regional landfill site.

The conclusion reached in this reevaluation is that three alternative locations (Blind Canyon, Towsley Canyon and Mission-Rustic-Sullivan Canyons) could serve as viable alternatives to Elsmere Canyon within the Los Angeles metropolitan area. Each of these site has its own set of site specific political, institutional and environmental problems that must be compared with the proposed Elsmere site to meet the City's, County's and Districts' goal of retaining 50 years of landfill disposal capacity within the Los Angeles Metropolitan area. These three sites should be evaluated as alternative regional landfill locations to the proposed Elsmere site.

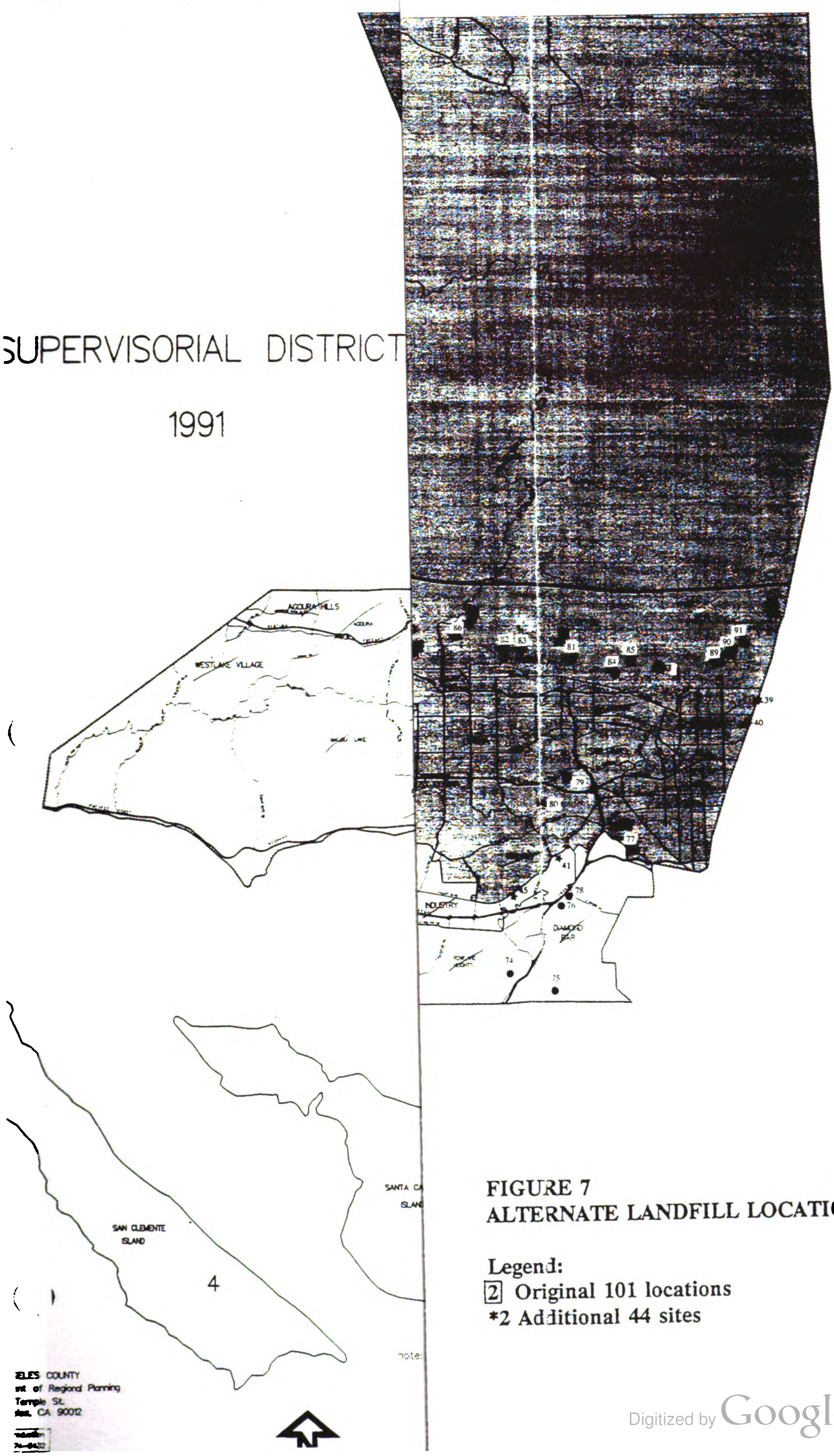


FIGURE 7
ALTERNATE LANDFILL LOCATIONS

Legend:
[2] Original 101 locations
*2 Additional 44 sites

APPENDIX A

APPENDIX A

ALTERNATE LANDFILL SITES

1.	SITE NAME:	CANOGA CANYON
	USGS QUADRANGLE:	CANOGA PARK
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	RESIDENTIAL AREA, HOMES IN CANYON BOTTOM.
2.	SITE NAME:	KELVIN CANYON
	USGS QUADRANGLE:	CANOGA PARK
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	RESIDENTIAL AREA, HOMES IN CANYON BOTTOM.
3.	SITE NAME:	VAN ALDEN CANYON
	USGS QUADRANGLE:	CANOGA PARK
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	RESIDENTIAL AREA, HOMES IN CANYON BOTTOM.
4.	SITE NAME:	CORBIN CANYON
	USGS QUADRANGLE:	CANOGA PARK
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	RESIDENTIAL AREA, HOMES IN CANYON BOTTOM.

5. SITE NAME: WHITE OAK CANYON

USGS QUADRANGLE: CANOGA PARK

SOURCE: MCEIR

DEFICIENCY: S5, U1, U2, U3, U4, U5

DESCRIPTION: SMALL RESIDENTIAL AREA JUST BELOW ENCINO RESERVOIR, HOMES IN CANYON BOTTOM.

6. SITE NAME: CABALLERO CANYON

USGS QUADRANGLE: CANOGA PARK

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4,

DESCRIPTION: HOMES AND GOLF COURSE IN CANYON BOTTOM. ACCESS TO UPPER CANYON THROUGH RESIDENTIAL STREETS.

7. SITE NAME: TOPANGA CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: SCHOOL AND HOMES ALONG THE ENTIRE CANYON BOTTOM.

8. SITE NAME: SANTA MARIA CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: RESIDENTIAL AREA AT CANYON MOUTH. ONLY ACCESS TO THE SITE IS THROUGH RESIDENTIAL STREETS IN TOPANGA CANYON.

9. **SITE NAME:** GARAPITO CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES IN CANYON BOTTOM. ONLY ACCESS TO THE SITE IS THROUGH RESIDENTIAL STREETS IN TOPANGA CANYON.

10. **SITE NAME:** MANDEVILLE CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ALONG ENTIRE CANYON BOTTOM. ONLY ACCESS THROUGH RESIDENTIAL AREAS VIA SUNSET BLVD OR MULHOLLAND.

11. **SITE NAME:** PIEDRA GORDA CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS VIA PCH APPROXIMATELY 6 MILES FROM HIGHWAY 10.

12. **SITE NAME:** PARKER CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES IN CANYON BOTTOM AT MOUTH. ACCESS THROUGH RESIDENTIAL STREETS. 5 MILES UP PCH FROM HIGHWAY 10.

13. SITE NAME: CASTELLAMARE CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON RIDGES AND ON CANYON BOTTOM AT MOUTH OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS. 5 MILES UP PCH FROM HIGHWAY 10.

14. SITE NAME: SANTA YNEZ CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON CANYON FLOOR. TO GET TO FILLABLE VOLUME MUST TRAVEL 3 MILES UP CANYON BOTTOM THROUGH RESIDENTIAL STREETS. 4 MILES UP PCH FROM HIGHWAY 10.

15. SITE NAME: QUARRY CANYON/SANTA YNEZ CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: SIDE CANYON IN THE UPPER REACHES OF SANTA YNEZ. SAME DESCRIPTION AS SANTA YNEZ.

16. SITE NAME: TRAILER CANYON/SANTA YNEZ CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: SIDE CANYON TO SANTA YNEZ CANYON. HOMES AT MOUTH OF CANYON. ACCESS THROUGH 3 MILES OF RESIDENTIAL STREETS FROM MOUTH OF SANTA YNEZ CANYON. 4 MILES UP PCH FROM HIGHWAY 10 TO SANTA YNEZ CANYON.

17. SITE NAME: PULGA CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES IN CANYON BOTTOM. ACCESS TO FILLABLE VOLUME THROUGH RESIDENTIAL STREETS WITHIN CANYON. 3 MILES UP PCH FROM HIGHWAY 10, 1.5 MILES UP SUNSET BLVD.

18. SITE NAME: TEMASCAL CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U3, U4

DESCRIPTION: HOMES ON RIDGES AND CANYON BOTTOM AT MOUTH OF CANYON. 3.5 MILES UP PCH FROM HIGHWAY 10. 1.5 MILES OF RESIDENTIAL STREETS TO GET FROM PCH TO BEYOND HOMES.

19. SITE NAME: RIVAS CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5, C3

DESCRIPTION: RIVAS CANYON PARK AT MOUTH OF CANYON. HOMES ON RIDGES. ACCESS VIA 1.5 MILES OF RESIDENTIAL STREETS FROM SUNSET BLVD.

20. SITE NAME: ENCINO CREEK

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: S3, U1, U2, U3, U4, U5

DESCRIPTION: HEAVILY RESIDENTIAL, SCHOOLS.

21. SITE NAME: BALLINA DRIVE

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: SMALL CANYON, HEAVILY RESIDENTIAL.

22. SITE NAME: STONE CANYON NORTH

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES IN CANYON BOTTOM AND ON RIDGES. HEAVILY RESIDENTIAL. ACCESS SOUTH FROM THE 101 FREEWAY THROUGH RESIDENTIAL STREETS VIA NOBLE OR KESTER AVENUES.

23. SITE NAME: DIXIE CANYON

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES. HEAVILY RESIDENTIAL.

24. SITE NAME: WOODHILL CANYON

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: SMALL CANYON, HEAVILY RESIDENTIAL.

25.	SITE NAME:	FRYMAN CANYON/IREDELL CANYON
	USGS QUADRANGLE:	VAN NUYS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	HOMES ON CANYON BOTTOM AND RIDGES.
26.	SITE NAME:	SEPULVEDA PASS
	USGS QUADRANGLE:	VAN NUYS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	405 FREEWAY FROM 1/8 MILE NORTH OF SEPULVEDA BLVD NORTHWARD. MAJOR TRAFFIC THOROUGHFARE. DEVELOPMENT ON RIDGES.
27.	SITE NAME:	SEPULVEDA PASS NORTH
	USGS QUADRANGLE:	VAN NUYS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5,
	DESCRIPTION:	405 FREEWAY FROM 1/8 MILE NORTH OF SEPULVEDA BLVD SOUTHWARD. MAJOR TRAFFIC THOROUGHFARE. DEVELOPMENT ON RIDGES.
28.	SITE NAME:	CONROCK
	USGS QUADRANGLE:	VAN NUYS
	SOURCE:	MCEIR
	DEFICIENCY:	S3, U1, U2, U3
	DESCRIPTION:	GRAVEL PIT. COMPLETELY SURROUNDED BY RESIDENTIAL AND INDUSTRIAL DEVELOPMENT. ADJACENT TO BYRD JR. HIGH SCHOOL.

29. SITE NAME: COLDWATER CANYON NORTH

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND RIDGES. ACCESS SOUTH FROM THE 101 FREEWAY THROUGH RESIDENTIAL STREETS VIA COLDWATER CANYON AVE.

30. SITE NAME: LAUREL CANYON NORTH

USGS QUADRANGLE: VAN NUYS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: LAUREL CANYON BLVD NORTH OF MULHOLLAND DR. HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS SOUTHWARD ON LAUREL CANYON BLVD FROM THE 101 FREEWAY.

31. SITE NAME: STONE CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: UPPER REACHES OF CANYON USED AS RESERVOIRS (UPPER STONE CANYON RESERVOIR AND STONE CANYON RESERVOIR). HOMES ON CANYON BOTTOM IN LOWER REACHES OF CANYON AND ON RIDGES. ACCESS THROUGH RESIDENTIAL STREETS.

32. SITE NAME: COLDWATER CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND RIDGES. ACCESS NORTH FROM SUNSET BLVD THROUGH RESIDENTIAL STREETS VIA COLDWATER CANYON AVENUE.

33. SITE NAME: KENTER CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON CANYON BOTTOM AT MOUTH OF CANYON AND ON RIDGES. ACCESS TO FILLABLE VOLUME IN UPPER REACHES THROUGH RESIDENTIAL STREETS VIA KENTER AVENUE.

34. SITE NAME: BUNDY CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON CANYON BOTTOM AT MOUTH OF CANYON AND ON RIDGES. ACCESS TO FILLABLE VOLUME IN UPPER REACHES THROUGH RESIDENTIAL STREETS VIA BUNDY DRIVE.

35. SITE NAME: BROWNFIELD CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES.

36. SITE NAME: METROPOLITAN CANYON (CANYON X)

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3

DESCRIPTION: NO FEASIBLE ACCESS. BOTTOM OF CANYON USED BY METROPOLITAN WATER DISTRICT FOR RESERVOIR. LESS THAN 2 MILLION TONS OF CAPACITY.

37.	SITE NAME:	HOGG CANYON
	USGS QUADRANGLE:	BEVERLY HILLS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	HOMES ON CANYON BOTTOM AND RIDGES. ACCESS THROUGH RESIDENTIAL STREETS VIA MARAGA DRIVE.
38.	SITE NAME:	ROSCOMARE RD (DRY CANYON)
	USGS QUADRANGLE:	BEVERLY HILLS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS NORTH ON BELLAGIO RD VIA SUNSET BLVD THROUGH RESIDENTIAL STREETS.
39.	SITE NAME:	BENEDICT CANYON
	USGS QUADRANGLE:	BEVERLY HILLS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5,
	DESCRIPTION:	HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS NORTH ON BENEDICT CANYON DR VIA SUNSET BLVD THROUGH RESIDENTIAL STREETS.
40.	SITE NAME:	BENEDICT CANYON NORTH
	USGS QUADRANGLE:	BEVERLY HILLS
	SOURCE:	MCEIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	NORTHERN LOBE OF BENEDICT CANYON. HOMES ON CANYON BOTTOM AND ON RIDGES.

41. SITE NAME: PEAVINE CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND RIDGES. ACCESS THROUGH RESIDENTIAL STREETS.

42. SITE NAME: HIGGINS CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS THROUGH RESIDENTIAL STREETS.

43. SITE NAME: FRANKLIN CANYON

USGS QUADRANGLE: BEVERLY HILLS

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: HOMES ON RIDGES. UPPER FRANKLIN CANYON RESERVOIR AND LOWER FRANKLIN CANYON RESERVOIR NO. 2 ON BOTTOM OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

44. SITE NAME: LAUREL CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: LAUREL CANYON BLVD SOUTH OF MULHOLLAND DR. HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS NORTHWARD THROUGH RESIDENTIAL STREETS ON LAUREL CANYON BLVD VIA HOLLYWOOD BLVD.

45. SITE NAME: BALDWIN HILLS

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR/PHEIR

DEFICIENCY: S3, S6, U1, U2, U3

DESCRIPTION: GEOLOGY DEFICIENT. MAJOR SITE PREPARATION DUE TO OIL WELLS. SITE COMPLETELY SURROUNDED BY URBAN DEVELOPMENT.

46. SITE NAME: NICHOLS CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES. ACCESS NORTHWARD ON NICHOLS CANYON DR VIA HOLLYWOOD BLVD THROUGH RESIDENTIAL STREETS.

47. SITE NAME: CURSON CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: HOMES ON CANYON FLOOR AND ON RIDGES. SMALL. ACCESS NORTHWARD ON CURSON AVE VIA HOLLYWOOD BLVD THROUGH RESIDENTIAL STREETS.

48. SITE NAME: RUNYON CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5, C3

DESCRIPTION: HOMES AT MOUTH OF CANYON. RUNYON CANYON PARK IN UPPER REACHES OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

49. SITE NAME: OUTPOST DRIVE

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON CANYON BOTTOM AND ON RIDGES. HIGHLY RESIDENTIAL.

50. SITE NAME: CAHUENGA PASS

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: CAHUENGA PASS FROM MULHOLLAND DR SOUTHWARD. MAJOR TRAFFIC THOROUGHFARE. DEVELOPMENT ON BOTH SIDES OF THE PASS.

51. SITE NAME: CANYON DRIVE

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5,

DESCRIPTION: LOWER END OF BRUSH CANYON. RESIDENTIAL AREA. HOMES ON CANYON BOTTOM AND SIDES. ACCESS THROUGH RESIDENTIAL STREETS.

52. SITE NAME: HOLLY CANYON/HOLLYWOOD RESERVOIR

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: RESERVOIR. HOMES ON CANYON FLOOR AND ABOVE RESERVOIR. ACCESS THROUGH RESIDENTIAL STREETS.

53. SITE NAME: FERN DELL DRIVE/WESTERN CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5, C3

DESCRIPTION: HOMES ON CANYON BOTTOM AT LOWER END. UPPER END IN GRIFFITH PARK. ACCESS THROUGH RESIDENTIAL STREETS.

54. SITE NAME: VERMONT CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: ACCESS THROUGH RESIDENTIAL STREETS. GIRFFITH PARK. LOWER CANYON USED AS GOLF COURSE. GREEK THEATER ON CANYON BOTTOM.

55. SITE NAME: ABERDEEN CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: ACCESS THROUGH RESIDENTIAL STREETS. GRIFFITH PARK. LOWER CANYON USED AS GOLF COURSE.

56. SITE NAME: COMMONWEALTH CANYON

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: ACCESS THROUGH RESIDENTIAL STREETS. GRIFFITH PARK. LOWER CANYON USED AS GOLF COURSE.

57. SITE NAME: SILVER LAKE RESERVOIR

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: S3, U1, U2, U3, U4, U5

DESCRIPTION: RESERVOIR. COMPLETELY SURROUNDED BY DEVELOPMENT. ACCESS THROUGH RESIDENTIAL STREETS.

58. SITE NAME: MID-CITY GRANITE

USGS QUADRANGLE: HOLLYWOOD

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: SOUTH SIDE OF HOLLYWOOD HILLS. SIDE CANYON TO BRUSH CANYON IN GRIFFITH PARK. ACCESS THROUGH RESIDENTIAL STREETS VIA CANYON DRIVE.

59. SITE NAME: HOLLY CANYON NORTH

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5, C3

DESCRIPTION: HOLLY CANYON ABOVE RESERVOIR. HOMES ON RIDGES. GRIFFITH PARK. ACCESS THROUGH RESIDENTIAL STREETS.

60. SITE NAME: CAHUENGA PASS NORTH

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: CAHUENGA PASS FROM MULHOLLAND DR NORTHWARD. MAJOR TRAFFIC THOROUGHFARE. DEVELOPMENT ON BOTH SIDES OF THE PASS.

61. SITE NAME: COYOTE CANYON

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U5

DESCRIPTION: INDUSTRIAL DEVELOPMENT AT THE CANYON MOUTH. HOMES ON RIDGES.

62. SITE NAME: CAHUENGA PEAK NORTH

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5

DESCRIPTION: CANYON DIRECTLY NORTH OF CAHUENGA PEAK. LOWER CANYON PART OF FOREST LAWN MEMORIAL PARK. ACCESS TO UPPER CANYON THROUGH FOREST LAWN MEMORIAL PARK.

63. SITE NAME: SENNET CANYON

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5

DESCRIPTION: SENNET CANYON HAS BEEN FULLY DEVELOPED AS A PART OF FOREST LAWN MEMORIAL PARK.

64. SITE NAME: BRUSH CANYON

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: HOMES ON CANYON BOTTOM AT MOUTH. ACCESS THROUGH RESIDENTIAL STREETS ALONG CANYON DRIVE. GRIFFITH PARK.

65. SITE NAME: GRIFFITH PARK BOY'S CAMP

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: GRIFFITH PARK JUST SOUTH OF TOYON CANYON. LOWER CANYON DEVELOPED AS THE HARDING GOLF COURSE. ACCESS THROUGH THE GOLF COURSE.

66. SITE NAME: SPRING CANYON

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: GRIFFITH PARK DIRECTLY NORTHEAST OF MOUNT HOLLYWOOD. LOWER CANYON DEVELOPED AS THE WILSON GOLF COURSE. ACCESS THROUGH THE GOLF COURSE.

67. SITE NAME: FERN CANYON

USGS QUADRANGLE: BURBANK

SOURCE: MCEIR

DEFICIENCY: U1, U3, U4, U5, C3

DESCRIPTION: GRIFFITH PARK. LOWER CANYON DEVELOPED AS THE WILSON GOLF COURSE. ACCESS THROUGH THE GOLF COURSE.

68. SITE NAME: CHAVEZ RAVINE

USGS QUADRANGLE: LOS ANGELES

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: DIRECTLY EAST OF DODGER STADIUM. HOMES ON RIDGES. INDUSTRIAL DEVELOPMENT ON CANYON BOTTOM. MAJOR ACCESS ROUTE TO DODGER STADIUM. LACKING COVER AND CAPACITY.

69. SITE NAME: STADIUM WAY

USGS QUADRANGLE: LOS ANGELES

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U4, U5, C3

DESCRIPTION: ELYSIAN PARK. NORTH OF DODGER STADIUM. MAJOR ACCESS ROUTE TO DODGER STADIUM. LACKING COVER AND CAPACITY.

70. SITE NAME: LA QUESTA LADO

USGS QUADRANGLE: TORRANCE

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3

DESCRIPTION: GEOLOGICALLY UNSUITABLE. COMPLETELY SURROUNDED BY COMMERCIAL AND HOUSING DEVELOPMENTS.

71. SITE NAME: U.S. NAVAL RESERVATION

USGS QUADRANGLE: TORRANCE

SOURCE: MCEIR

DEFICIENCY: U1, U2, U3, U5

DESCRIPTION: GEOLOGICALLY UNSUITABLE. COMPLETELY SURROUNDED BY COMMERCIAL AND HOUSING DEVELOPMENTS.

72. SITE NAME: CHANDLER'S PIT

USGS QUADRANGLE: TORRANCE

SOURCE: MCEIR

DEFICIENCY: U1, U3

DESCRIPTION: COMPLETELY SURROUNDED BY A GOLF COURSE AND RESIDENTIAL AND COMMERCIAL DEVELOPMENT. HOMES ON RIDGES.

73. SITE NAME: FULLERTON ROAD (CANYON 550)

USGS QUADRANGLE: LA HABRA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: JUST NORTH OF ORANGE COUNTY LINE, EAST OF FULLERTON ROAD. MOUTH OF CANYON TERMINATES AT LADERA PALMA SCHOOL IN ORANGE COUNTY. HOUSING DEVELOPMENTS TO THE DIRECT SOUTH AND WEST. ACTIVE OIL FIELD.

74. SITE NAME: RINCON DE LA BREA (CANYON 549)

USGS QUADRANGLE: YORBA LINDA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3

DESCRIPTION: JUST WEST OF ORANGE FREEWAY 57, JUST SOUTH OF BREA CANYON CUTOFF. HOMES ON RIDGE. HOMES ACROSS THE FREEWAY ON THE RIDGES HAVE FULL VIEW.

75. SITE NAME: TONNER CANYON (CANYON 574)

USGS QUADRANGLE: YORBA LINDA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: DEVELOPMENT ON RIDGES. ACCESS THROUGH STEEP RESIDENTIAL STREETS IN LOS ANGELES COUNTY OR ALONG CANYON BOTTOM VIA ORANGE COUNTY OR SAN BERNARDINO COUNTY.

76. SITE NAME: TRES HERMANOS CANYON

USGS QUADRANGLE: YORBA LINDA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: FULLY DEVELOPED AS A HOUSING TRACT. HOMES ON RIDGES.

77.	SITE NAME:	PHILLIPS RANCH (CANYON 546)
	USGS QUADRANGLE:	SAN DIMAS
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	FULLY DEVELOPED AS A HOUSING TRACT.
78.	SITE NAME:	DIAMOND BAR (CANYON 545)
	USGS QUADRANGLE:	SAN DIMAS
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	FULLY DEVELOPED AS A HOUSING TRACT.
79.	SITE NAME:	SAN DIMAS (CANYON 502)
	USGS QUADRANGLE:	SAN DIMAS
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	FULLY DEVELOPED AS A HOUSING TRACT.
80.	SITE NAME:	SAN JOSE HILLS (CANYON 508)
	USGS QUADRANGLE:	SAN DIMAS
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	FULLY DEVELOPED AS A HOUSING TRACT.

81. SITE NAME: MORGAN CANYON (CANYON 453a)

USGS QUADRANGLE: GLENDORA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON BOTTOM OF CANYON AT MOUTH AND ON RIDGES. ACCESS THROUGH RESIDENTIAL STREETS.

82. SITE NAME: HARROW CANYON (CANYON 453b)

USGS QUADRANGLE: GLENDORA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES ON BOTTOM OF CANYON AT MOUTH AND ON RIDGES. DEBRIS BASIN IN MIDDLE OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

83. SITE NAME: ENGLEWILD CANYON (CANYON 453c)

USGS QUADRANGLE: GLENDORA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: HOMES IN CANYON BOTTOM AT MOUTH. ACCESS THROUGH RESIDENTIAL STREETS.

84. SITE NAME: SYCAMORE CANYON

USGS QUADRANGLE: GLENDORA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: U1, U2, U3

DESCRIPTION: HOMES AND COUNTY JUVENILE CAMP ON RIDGES AT CANYON MOUTH.

85.	SITE NAME:	HAM CANYON (CANYON 454)
	USGS QUADRANGLE:	GLENDORA
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U5
	DESCRIPTION:	HOMES ON CANYON BOTTOM AND RIDGE AT CANYON MOUTH.
86.	SITE NAME:	BEATTY CANYON (CANYON 452)
	USGS QUADRANGLE:	AZUSA
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U2, U3, U4, U5
	DESCRIPTION:	HOMES ON CANYON BOTTOM. ACCESS THROUGH RESIDENTIAL STREETS.
87.	SITE NAME:	EATON CANYON (CANYON 405)
	USGS QUADRANGLE:	MT. WILSON
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U3, U4
	DESCRIPTION:	HOMES AT CANYON MOUTH WITH DIRECT VIEW UP CANYON. ACCESS THROUGH RESIDENTIAL STREETS.
88.	SITE NAME:	CLAMSHELL CANYON
	USGS QUADRANGLE:	MT. WILSON
	SOURCE:	1983 PUENTE HILLS EIR
	DEFICIENCY:	U1, U3, U4
	DESCRIPTION:	HOMES AT MOUTH OF CANYON. DEBRIS BASIN AT MOUTH OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

89. SITE NAME: GAIL CANYON

USGS QUADRANGLE: MT. BALDY

SOURCE: 1985 SPADRA EIR

DEFICIENCY: U1, U2, U3, U4

DESCRIPTION: HOMES ON RIDGE. HOMES AT CANYON MOUTH HAVE DIRECT VIEW OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

90. SITE NAME: BURBANK CANYON

USGS QUADRANGLE: MT. BALDY

SOURCE: 1985 SPADRA EIR

DEFICIENCY: U1, U2, U3, U4, U5

DESCRIPTION: THOMPSON CREEK DAM AND RESERVOIR AT MOUTH OF CANYON. HOMES AT CANYON MOUTH HAVE DIRECT VIEW OF CANYON. ACCESS THROUGH RESIDENTIAL STREETS.

91. SITE NAME: CHICKEN CANYON

USGS QUADRANGLE: MT. BALDY

SOURCE: CSD - REVIEW OF AERIAL PHOTOGRAPH

DEFICIENCY: U1, U4

DESCRIPTION: ACCESS THROUGH RESIDENTIAL STREETS VIA MILLS AVENUE AND MT. BALDY RD.

92. SITE NAME: BLIND CANYON

USGS QUADRANGLE: OAT MOUNTAIN/SANTA SUSANA

SOURCE: PRIVATE PROPONENT

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: NORTH OF THE SIMI VALLEY FREEWAY NEAR THE LOS ANGELES/VENTURA COUNTY BORDER.

93. SITE NAME: BROWNS CANYON

USGS QUADRANGLE: OAT MOUNTAIN

SOURCE: CoSWMP - 1975

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: NORTH OF SIMI VALLEY FREEWAY NEAR CHATSWORTH.

94. SITE NAME: ELSMERE CANYON

USGS QUADRANGLE: SAN FERNANDO/OAT MOUNTAIN

SOURCE: CoSWMP - 1986

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: EAST OF THE ANTELOPE VALLEY FREEWAY NEAR NEWHALL.

95. SITE NAME: FISH CANYON

USGS QUADRANGLE: AZUSA

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: NORTH OF HUNTINGTON DRIVE, EAST OF FISH CANYON ROAD.

96. SITE NAME: LA TUNA CANYON

USGS QUADRANGLE: BURBANK

SOURCE: CoSWMP - 1975

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: VERDUGO MOUNTAINS BETWEEN SUN VALLEY AND LA CANADA.

97. SITE NAME: MISSION/RUSTIC-SULLIVAN CANYONS

USGS QUADRANGLE: TOPANGA/BEVERLY HILLS

SOURCE: CoSWMP - 1986

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: SOUTH OF MULHOLLAND, WEST OF THE SAN DIEGO FREEWAY.

98. SITE NAME: PENA CANYON

USGS QUADRANGLE: TOPANGA

SOURCE: 1980 MISSION CANYON EIR

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: NORTH OF THE PACIFIC COAST HIGHWAY, APPROXIMATELY 1 MILE WEST OF TOPANGA CANYON BLVD.

99. SITE NAME: SIERRA MADRE CANYON (LITTLE SANTA ANITA CANYON)

USGS QUADRANGLE: MT. WILSON

SOURCE: 1983 PUENTE HILLS EIR

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: WEST OF SANTA ANITA AVE., NORTH OF SIERRA MADRE ROAD.

100. SITE NAME: TOWSLEY

USGS QUADRANGLE: OAT MOUNTAIN

SOURCE: CSD PROPOSED

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: WEST OF THE GOLDEN STATE FREEWAY NEAR NEWHALL.

101. SITE NAME: TOYON II

USGS QUADRANGLE: BURBANK

SOURCE: CoSWMP - 1986

DEFICIENCY: NO CRITICAL DEFICIENCY - EVALUATED AS A POTENTIAL LANDFILL SITE.

DESCRIPTION: NORTHWEST SIDE OF GRIFFITH PARK.

APPENDIX B

1. **SITE NAME:** CANOGA PARK

USGS QUADRANGLE: CANOGA PARK

DESCRIPTION: URBAN AREA OF THE SANTA MONICA MOUNTAINS IN WOODLAND HILLS

LOCATION: SEE PLATE 1 IN THE PHOTO APPENDIX, AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Canoga Park site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the north slope of the Santa Monica Mountains in the southern portion of Woodland Hills.

Districts' Conclusion

The Canoga Park site was eliminated from further consideration by the Districts during the initial screening process. The Canoga Park site (Site 26, Table 1, Northside Canyons) was eliminated from further consideration based on urban land use conflicts as outlined in Table 2 (U1, U2, U3, U4 and U5). Specifically, homes were located within the canyon and surrounded the site on three sides.

Updated Review and Conclusion

A review of the 1990 aerial photograph of the Canoga Park site (Plate 1, Photo Appendix) verifies the urban setting and critical deficiencies which justified disqualifying this site. To use the Canoga Park site (a small canyon on the north slope of the Santa Monica Mountains) as a regional landfill for the Los Angeles Metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day and they would exit the freeway at Canoga Avenue and travel approximately one mile south to Mulholland Drive and the entrance to the canyon. This traffic would pass through residential areas, including the Woodland Hills Country Club. Based on the access deficiency alone (U4), this alternative location would cause major land use incompatibilities.

As the 1990 aerial photograph shows, the Canoga Park site is located directly across, and uphill, from existing residences and has a few structures located within the site. These residences would be located directly adjacent to landfill operations and this small site does not have sufficient space to establish effective buffers, either on the property or adjacent to the site. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts of operations at this location. The impacts would be unacceptably high at this urban location based on these site deficiencies.

2.	**SITE NAME:**	**KELVIN CANYON**
	USGS QUADRANGLE:	**CANOGA PARK**
	DESCRIPTION:	**URBAN AREA OF THE SANTA MONICA MOUNTAINS IN WOODLAND HILLS**
	LOCATION:	**SEE PLATE 1 IN THE PHOTO APPENDIX AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Kelvin Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the north slope of the Santa Monica Mountains in the southern portion of Woodland Hills.

Districts' Conclusion

Kelvin Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Kelvin Canyon (Site 25, Table 1, Northside Canyons) was determined to have critical urban deficiencies (U1, U2, U3, U4 and U5) by the Districts. Appendix G of the Final Mission Canyon EIR described the critical deficiencies in the following manner:

Site would require approximately 1 mile of travel through residential areas.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Kelvin Canyon site (Plate 1, Photo Appendix) verifies the critical deficiencies that justified disqualification of the site. To use Kelvin Canyon as a regional landfill site for the Los Angeles Metropolitan Area, several thousand refuse trucks would be added to the Ventura Freeway each day and they would exit the freeway at De Soto Avenue and travel approximately one mile south through residential streets and by Serrania Park. Based on this access deficiency alone (U4), this alternative location would cause major land use incompatibilities and is unsuitable for a landfill.

As the 1990 aerial photograph shows, Kelvin Canyon is directly across from a residential area and the site could not be isolated from residential neighborhoods. The site does not have sufficient space or isolation to mitigate the adjacent uses from landfill operations resulting in both refuse truck traffic and site operations contributing to land use incompatibility at this location. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts of operations in Kelvin Canyon. The impact of establishing a landfill at Kelvin Canyon would be unacceptably high at this urban location based on these site deficiencies.

3.	**SITE NAME:**	**VAN ALDEN CANYON**
	USGS QUADRANGLE:	**CANOGA PARK**
	DESCRIPTION:	**URBAN AREA OF THE SANTA MONICA MOUNTAINS IN TARZANA**
	LOCATION:	**SEE PLATE 1 IN THE PHOTO APPENDIX AND PAGE 21, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Van Alden Canyon was initially evaluated as an alternative to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the north slope of the Santa Monica Mountains in the southern portion of Tarzana.

Districts' Conclusion

The Van Alden Canyon site was eliminated from further consideration by the District during the initial screening process. The Van Alden Canyon site (Site 23, Table 1, Northside Canyons) was eliminated from further consideration based on urban land use conflicts as outlined in Table 2 (U1, U2, U3, U4 and U5). Specifically, homes occupied the canyon almost to the top of the ridge.

Updated Review and Conclusions

A review of the 1990 aerial photograph which includes Van Alden Canyon (Plate 1, Photo Appendix) verifies the urban setting and critical deficiencies which justified disqualifying this site. Van Alden Canyon is occupied with homes along much of its extent and continues to undergo development based on the aerial photograph. In addition, to use Van Alden Canyon (a small canyon on the north slope of the Santa Monica Mountains) as a regional landfill for the Los Angeles metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day and they would exit the freeway on Tampa Avenue and travel approximately 1.5 miles south into the canyon. Based on these urban conflicts and the access deficiency, developing this alternative location as a landfill would cause major land use incompatibilities.

As the 1990 aerial photograph shows, Van Alden Canyon has developed as a residential area and a landfill could not be sited at this location without large scale displacement of existing residences. No isolation from surrounding residential development would be feasible. This site does not have sufficient space or isolation to mitigate impacts on residential uses from landfill operations. The impact of establishing a landfill at the Van Alden Canyon site would be unacceptably high at this location based on these deficiencies.

4. **SITE NAME:** **CORBIN CANYON**

USGS QUADRANGLE: **CANOGA PARK**

DESCRIPTION: **URBAN AREA OF THE SANTA MONICA MOUNTAINS IN WOODLAND HILLS**

LOCATION: **SEE PLATE 1 IN THE PHOTO APPENDIX AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Corbin Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Corbin Canyon is located on the north slope of the Santa Monica Mountains in the southern portion of Woodland Hills.

Districts' Conclusion

Corbin Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Corbin Canyon site (Site 26, Table 1, Northside Canyons) was determined to have critical urban deficiencies (U1, U2, U3, U4 and U5). Appendix G of the Final Mission Canyon EIR described the critical deficiencies in the following manner:

(a) Site access would be from the Ventura Freeway south on Corbin Avenue through more than 2 miles of residential streets.

(b) Development on surrounding canyon ridges is significant and is positioned in such a manner as to make mitigation of impacts by berm construction nearly infeasible.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Corbin Canyon site (Plate 1, Photo Appendix) verifies the urban setting and critical deficiencies which justified disqualifying this site. To use Corbin Canyon as a regional landfill site for the Los Angeles metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day and they would exit on Winnetka Avenue to access Corbin Avenue and the alternative site. This traffic would pass by Taft High School and through the local community (primarily residential areas) for more than two miles to reach the site. Based on this access deficiency alone (U4), the Corbin Canyon alternative is determined to be unsuitable as a regional landfill site.

As the 1990 aerial photograph shows, the proximity of the Corbin Canyon alternative site to existing residences also contributed to these critical deficiencies. Several homes are located at the south end of the canyon and homes occupy almost the whole perimeter of the canyon. These residences would be located directly adjacent to the landfill operation and Corbin Canyon does not have sufficient space to establish effective buffers, i.e. isolate the site. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts at this location. Impacts would be unacceptably high at this urban location based on these site deficiencies.

5. **SITE NAME:** **WHITE OAK CANYON**

USGS QUADRANGLE: **CANOGA PARK**

DESCRIPTION: **URBAN AREA OF THE SANTA MONICA MOUNTAINS IN ENCINO**

LOCATION: **SEE PLATE 2 IN THE PHOTO APPENDIX AND PAGE 21, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

White Oak Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the north slope of the Santa Monica Mountains in the southern portion of Encino.

Districts' Conclusion

The White Oak Canyon site was eliminated from further consideration by the District during the initial screening process. The White Oak Canyon site (Site 21, Table 1, Northside Canyons) was eliminated from further consideration based on the presence of Encino Reservoir at the end of the canyon and the incompatibility of landfill activities with this existing reservoir, and the small residential area adjacent to the reservoir (S5, U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes White Oak Canyon (Plate 2, Photo Appendix) verifies the presence of the reservoir which justified disqualifying this site. White Oak Canyon is located upstream of the reservoir and developing a regional landfill at this location could result in siltation and damage to this reservoir which provides water for public use. Utilization of White Oak Canyon for a landfill would create a land use incompatibility that could not be mitigated since it would not be possible to totally isolate the Encino Reservoir from landfill operations and impacts. A regional landfill would cause the displacement of the reservoir which would constitute a critical deficiency (U5) in its own right. Based on this deficiency, the site was eliminated.

6. SITE NAME: CABALLERO CANYON

USGS QUADRANGLE: CANOGA PARK

DESCRIPTION: URBAN AREA OF THE SANTA MONICA MOUNTAINS IN TARZANA

LOCATION: SEE PLATE 2 IN THE PHOTO APPENDIX AND PAGE 21, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Caballero Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the north slope of the Santa Monica Mountains in the southern portion of Tarzana.

Districts' Conclusion

Caballero Canyon passed both the initial and secondary screening tests and was identified as one of the six alternative sites for comparison with Mission Canyon. Note that Caballero Canyon itself was not considered suitable for use as a landfill because the State had already funded acquisition of the main branch of the canyon along Caballero Creek as trail access from San Fernando Valley (Reseda Boulevard) to Topanga State Park on the south slope of the Santa Monica Mountains, directly south of the proposed site. Tributary canyons to Caballero Canyon were judged suitable for consideration of a landfill site.

The Districts' staff and Advisory Committee reviewers concluded that access to the site along Reseda Boulevard was acceptable because it is a major arterial with four lanes and provides some isolation from adjacent residential and recreational uses. In the rating process (see Figures 3, 4 and 5 in this document), Caballero Canyon was rated the least suitable of the five alternative sites to Mission Canyon because of urban encroachment and conservation issues, including the habitat values along Caballero Creek.

In the 1987 Districts' review of alternative locations, Caballero Canyon was disqualified from further consideration based on urban deficiencies (U1, U2, U3 and U4) which included homes and a golf course in the canyon bottom and access to the upper canyon through residential areas.

Updated Review and Conclusion

As noted in the 1987 review and in the 1990 aerial photograph which contains the Caballero Canyon site (Plate 2, Photo Appendix) development has progressed up Caballero Canyon and has eliminated any potential for siting a landfill at this location. The site now has critical deficiencies U1, U2, U3, U4 and U5. It is no longer possible to isolate a landfill from residences since the canyons at this location are now developed. This poses compatibility, mitigability, and displacement issues that are so major as to make the site unsuitable and eliminating it from further consideration. Also, the remaining undeveloped area between the existing residential development and Topanga State Park/Santa Monica National Park is so small as to make the site capacity inadequate (S5). Based on these deficiencies, Caballero Canyon is too urban and is eliminated from further consideration.

7. SITE NAME: TOPANGA CANYON

USGS QUADRANGLE: TOPANGA CANYON

DESCRIPTION: SOUTHERN SLOPE OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 3 IN THE PHOTO APPENDIX AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Topanga Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains facing the Pacific Ocean.

Districts' Conclusion

Topanga Canyon was eliminated from further consideration by the Districts during the initial screening process. The Topanga Canyon site (Site 40, Table 1, Southside Canyons) was eliminated from further consideration based on land use conflicts with urban development and state and national parks and recreation areas (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Topanga Canyon (Plate 3, Photo Appendix) verifies the urban setting and critical deficiencies (U1, U2, U3, U4 and U5) which justified disqualifying this site as a regional landfill alternative. Topanga Canyon contains residences clustered intermittently throughout the canyon and is a major access route from the San Fernando Valley to the coast. In addition to causing displacement of residences and an important access route, to use Topanga Canyon (a major canyon on the south slope of the Santa Monica Mountains) as a regional landfill for the Los Angeles metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day. They would exit the freeway on Topanga Avenue and travel approximately 3 miles south into the canyon. Based on these urban conflicts and the access deficiency, developing this alternative location as a landfill would cause major land use incompatibilities.

The creation of the Santa Monica Mountains National Recreation Area superseded the review in the Mission Canyon EIR, but Topanga State Park was in existence and also contributed to the determination to eliminate this site (C3). The impact of establishing a regional landfill at Topanga Canyon is unacceptably high and would preempt existing and future uses of higher value.

8. SITE NAME: **SANTA MARIA CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **SOUTHERN SLOPE OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 3 IN THE PHOTO APPENDIX AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Santa Maria Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Santa Maria Canyon is located on the south slope of the Santa Monica Mountains south of Woodland Hills.

Districts' Conclusion

Santa Maria Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Santa Maria Canyon (Site 42, Table 1, Northside Canyons) was determined to have haul time and critical urban deficiencies (S2, U1, U2, U3 and U4). The haul time deficiency (S2) was identified as a critical deficiency in the 1980 Mission Canyon EIR and this deficiency was not identified in the 1987 Study. Appendix G of the Final Mission Canyon EIR described the critical deficiencies in the following manner:

(a) Site is located on the northwest edge of wasteshed and because of distance and access problems, haul time would be about 2 hours.

(b) Approximately 1 1/2 miles of travel on Topanga Blvd. and over 2 miles of travel on Mulholland would be required after exiting the Ventura Freeway, all of which are busy residential streets.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Santa Maria Canyon site (Plate 3, Photo Appendix) verifies the urban setting which combined with the distance factor (S2) justifies eliminating this site. To use Santa Maria Canyon as a regional landfill site for the Los Angeles metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day. They would exit on Topanga Canyon Boulevard to access Mulholland Drive and from there to the alternative site. This traffic would traverse steep, small residential roads and the local neighborhood communities (primarily residential areas) for many miles to reach the site. Based on this access deficiency alone (U4), the Santa Maria Canyon alternative is determined to be unsuitable to be carried forward as a potential alternative landfill site.

As the 1990 aerial photograph shows, the proximity of the Santa Maria Canyon alternative site to existing residences, including many in the canyon itself, also contributes to the critical deficiencies identified for the site. Homes are located all along the canyon. These residences would have to be removed and/or relocated from the canyon before it could be used as a landfill (U5). The canyon does not have sufficient space to establish effective buffers, i.e. isolate the site. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts at this location. Impacts would be unacceptably high at this location based on these site deficiencies.

9. **SITE NAME:** **GARIPITO CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **SOUTHERN SLOPE OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 3 IN THE PHOTO APPENDIX AND PAGE 13, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Garipito Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Garipito Canyon is located on the south slope of the Santa Monica Mountains south of Woodland Hills.

Districts' Conclusion

Garipito Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Garipito Canyon (Site 41, Table 1, Northside Canyons) was determined to have critical haul time and urban deficiencies (S2, U1, U2, U3, U4 and U5). The haul time deficiency (S2) was identified as a critical deficiency in the 1980 Mission Canyon EIR and this deficiency was not identified in the 1987 Study. Appendix G of the Final Mission Canyon EIR described the critical deficiencies in the following manner:

(a) Site is located on the northwest edge of wasteshed and because of distance and access problems, haul time would be about 2 hours.

(b) Approximately 1 1/2 miles of travel on Topanga Blvd. and over 2 miles of travel on Mulholland would be required after exiting the Ventura Freeway, all of which are busy residential streets.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Garipito Canyon site (Plate 3, Photo Appendix) verifies the urban setting which combined with the distance factor (S2) justifies eliminating this site. To use Garipito Canyon as a regional landfill site for the Los Angeles metropolitan area, several thousand refuse trucks would be added to the Ventura Freeway each day. They would exit on Topanga Canyon Boulevard to access Mulholland Drive and from there to the site. This traffic would traverse steep, small residential roads and the local neighborhood communities (primarily residential areas) for many miles to reach the site. Based on this access deficiency alone (U4), Garipito Canyon is determined to be unsuitable for consideration as a regional landfill site.

As the 1990 aerial photograph shows, the proximity of the Garipito Canyon alternative site to existing residences, including many in the canyon itself, also contributes to the critical deficiencies identified for the site. Homes are located all along the canyon. These residences would have to be removed and/or relocated from the canyon before it could be used as a landfill (U5). The canyon does not have sufficient space to establish effective buffers, i.e. isolate the site so that landfill operations and impacts will not affect residents. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts at this location. Impacts would be unacceptably high at this location based on these site deficiencies.

10.	**SITE NAME:**	**MANDEVILLE CANYON**
	USGS QUADRANGLE:	**TOPANGA CANYON**
	DESCRIPTION:	**URBAN AREA OF THE SANTA MONICA MOUNTAINS WEST OF THE 405 FREEWAY**
	LOCATION:	**SEE PLATE 4 IN THE PHOTO APPENDIX AND PAGES 30-31, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Mandeville Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains west of the 405 Freeway and south of Encino.

Districts' Conclusion

The Mandeville Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Mandeville Canyon site (Site 31, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of urban development along the whole canyon and the incompatibility of landfill activities with these existing land uses (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Mandeville Canyon (Plate 4, Photo Appendix) verifies the presence of the residences which justified eliminating this site. Access to the site would be on the 405 Freeway to Sunset Boulevard and then to Mandeville Canyon Road. Both local roads are narrow and have residences directly adjacent to the roadway. To develop Mandeville Canyon would conflict with existing land uses and would require displacement of perhaps hundreds of residences (U1, U2, U3, U4 and U5). Utilization of Mandeville Canyon for a regional landfill would create a land use incompatibility that could not be mitigated since it would not be possible to isolate residential uses from landfill operations and impacts. Based on these deficiencies, the site was eliminated.

11. **SITE NAME:** **PIEDRA GORDA CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS WEST OF TOPANGA BOULEVARD**

LOCATION: **SEE PLATE 5 IN THE PHOTO APPENDIX AND PAGES 30-31, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Piedra Gorda Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. It is located on the south slope of the Santa Monica Mountains west of Topanga Canyon Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

Piedra Gorda Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Piedra Gorda Canyon (Site 45, Table 1, Southside Canyons) was determined to have critical access and urban deficiencies (S4, U1, U2, U3, and U4). The access deficiency (S4) was identified as a critical deficiency in the 1980 Mission Canyon EIR and this deficiency was not identified in the 1987 Study. Appendix G of the Final Mission Canyon EIR described the critical deficiencies in the following manner:

Access to the site would have to be through Peña Canyon and the site has no independent access.

Updated Review and Conclusion

A review of the 1992 aerial photograph which includes the Piedra Gorda Canyon site (Plate 5, Photo Appendix) verifies the lack of access and urban critical deficiencies. To use Piedra Gorda Canyon as a regional landfill site for the Los Angeles metropolitan area, several thousand refuse trucks would have to use Topanga Canyon Boulevard or pass through Santa Monica onto the Pacific Coast Highway and thence along the Pacific Coast Highway through Pacific Palisades for about seven miles. This traffic would traverse steep, small residential roads and the local neighborhoods (primarily residential areas) for many miles to reach the site and then would have to access the site through the adjacent canyon. Based on this access deficiency alone (S4), Piedra Gorda Canyon would be unsuitable as a regional landfill site. These traffic and urban access related impacts (U2, U3 and U4) would be unacceptably high at this location.

12. **SITE NAME:** **PARKER CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF TOPANGA BOULEVARD**

LOCATION: **SEE PLATE 5 IN THE PHOTO APPENDIX AND PAGES 115-122, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Parker Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains facing the Pacific Ocean.

Districts' Conclusion

The Parker Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Parker Canyon site (Site 39, Table 1, Southside Canyons) was eliminated from further consideration based on land use conflicts with urban development, including Topanga State Park (U1, U2, U3 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Parker Canyon (Plate 5, Photo Appendix) verifies the presence of a large residential development located at the entrance into the canyon and extending up the canyon for some distance which justifies eliminating disqualifying this site (U1, U2 and U3). To use Parker Canyon as a regional landfill site for the Los Angeles metropolitan area, several thousand refuse trucks must traverse Topanga Canyon Boulevard from the Ventura Freeway or pass through Santa Monica onto the Pacific Coast Highway and thence along the Pacific Coast Highway through Pacific Palisades for about five miles. This traffic would traverse steep, small residential roads and pass through the local community (primarily residential areas) for many miles to reach the site (U4). Landfill operations could not isolated and sufficiently mitigated to protect the existing residential uses (U3). Displacement of the residential uses is not considered feasible since several hundred units would be affected (U5). Similarly, the effects on Topanga State Park create conflicts with landfill activities and an additional critical deficiency (C3). The impact of establishing a regional landfill at Parker Canyon would be unacceptably high and would preempt existing and future uses of higher value. Based on these deficiencies, the site was eliminated.

13. **SITE NAME:** **CASTELLAMARE (LOS LIONES) CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF TOPANGA BOULEVARD**

LOCATION: **SEE PLATE 5 IN THE PHOTO APPENDIX AND PAGES 115-122, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Castellamare Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Topanga Canyon Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Castellamare Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Castellamare Canyon site (Site 38, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of Topanga State Park and the residential development at the mouth of the canyon adjacent to Pacific Coast Highway. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon (U1, U2, U3, and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Castellamare Canyon (Plate 5, Photo Appendix) verifies the presence of the residences at the mouth of and on the east ridges of this canyon which justified eliminating this site. Castellamare Canyon is located at the east edge of Pacific Palisades community and the southern edge of Topanga State Park. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses (C3, U1, U2, U3, U4 and U5). Utilization of Castellamare Canyon for a regional landfill would create land use incompatibilities that could not be mitigated. Based on these deficiencies, the site was eliminated.

14. SITE NAME: **SANTA YNEZ CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF PALISADES DRIVE**

LOCATION: **SEE PLATE 6 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Santa Ynez Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Palisades Drive and north of Sunset Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Santa Ynez Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Santa Ynez Canyon site (Site 37, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of Topanga State Park and the residential development at the mouth of the canyon adjacent to Pacific Coast Highway and along the adjacent west and east ridges. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon (U1, U2, U3 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Santa Ynez Canyon (Plate 6, Photo Appendix) verifies the presence of the residences at the mouth of and on the west and east ridges of this canyon which justified eliminating this site (C3, U1, U2, U3 and U4). Santa Ynez Canyon is located at the east edge of Pacific Palisades community and the eastern edge of Topanga State Park. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses (U5). Utilization of Santa Ynez Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

15. SITE NAME: **QUARRY-SANTA YNEZ CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF PALISADES HIGHLANDS**

LOCATION: **SEE PLATE 4 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

<u>Site Summary</u>

Quarry-Santa Ynez Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Palisades Highlands and north of Sunset Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

<u>Districts' Conclusion</u>

The Quarry-Santa Ynez Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Quarry-Santa Ynez Canyon site (Site 37, Table 1, Southside Canyons) was eliminated from further consideration based on its location inside of Topanga State Park and the residential development at the mouth of the canyon leading to the site. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon and adjacent to the canyon (U1, U2, U3 and U4).

<u>Updated Review and Conclusion</u>

A review of the 1990 aerial photograph which includes Quarry-Santa Ynez Canyon (Plate 4, Photo Appendix) verifies the presence of the residences at the mouth of and on the west ridge of this canyon which justified eliminating this site. Quarry-Santa Ynez Canyon is located at the east edge of Palisades Highlands community and the southeastern edge of Topanga State Park (C3). Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses (U1, U2, U3, U4 and U5). Utilization of Quarry-Santa Ynez Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

16. SITE NAME:	**TRAILER-SANTA YNEZ CANYON**
USGS QUADRANGLE:	**TOPANGA CANYON**
DESCRIPTION:	**COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF PALISADES HIGHLANDS**
LOCATION:	**SEE PLATE 4 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Trailer-Santa Ynez Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Palisades Highlands and north of Sunset Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Trailer-Santa Ynez Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Trailer-Santa Ynez Canyon site (Site 37, Table 1, Southside Canyons) was eliminated from further consideration based on its location inside of Topanga State Park and the residential development at the mouth of the canyon leading to the site. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon and adjacent to the canyon (U1, U2, U3 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Trailer-Santa Ynez Canyon (Plate 4, Photo Appendix) verifies the presence of the residences at the mouth of and on the west ridge of this canyon which justified eliminating this site (U1, U2, U3 and U4). Trailer-Santa Ynez Canyon is located at the east edge of Palisades Highlands community and the southeastern edge of Topanga State Park (C3). Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses (U5). Utilization of Trailer-Santa Ynez Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

17.	**SITE NAME:**	**PULGA CANYON**
	USGS QUADRANGLE:	**TOPANGA CANYON**
	DESCRIPTION:	**COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF PALISADES DRIVE AND SUNSET BOULEVARD**
	LOCATION:	**SEE PLATE 6 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Pulga Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Palisades Boulevard and north of Sunset Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Pulga Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Pulga Canyon site (Site 36, Table 1, Southside Canyons) was eliminated from further consideration based on its location adjacent to and just inside of Topanga State Park and the residential development at the mouth and throughout most of the canyon. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon and adjacent to the canyon (U1, U2, U3 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Pulga Canyon (Plate 6, Photo Appendix) verifies the presence of the residences at the mouth of and throughout most of this canyon which justified eliminating this site (U1, U2, U3, U4 and U5). Pulga Canyon is located east of Palisades Drive and at the southeastern edge of Topanga State Park (C3). Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses. Utilization of Pulga Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

18. SITE NAME: **TEMESCAL CANYON**

USGS QUADRANGLE: **TOPANGA CANYON**

DESCRIPTION: **COASTAL AREA OF THE SANTA MONICA MOUNTAINS EAST OF PALISADES DRIVE AND NORTH OF SUNSET BOULEVARD**

LOCATION: **SEE PLATE 6 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Temescal Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains east of Palisades Boulevard and north of Sunset Boulevard where it opens directly onto Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Temescal Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Temescal Canyon site (Site 35, Table, Southside Canyons) was eliminated from further consideration based on its location inside of Topanga State Park and the residential development at the mouth and throughout most of the canyon leading to the park. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon and adjacent to the canyon (U3 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Temescal Canyon (Plate 6, Photo Appendix) verifies the presence of the residences at the mouth of and throughout most of this canyon which justified eliminating this site (U1, U2, U3, U4 and U5). Temescal Canyon is located east of Palisades Drive and at the southeastern edge of Topanga State Park (C3). Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses. Utilization of Temescal Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

19. SITE NAME: RIVAS CANYON

USGS QUADRANGLE: TOPANGA CANYON

DESCRIPTION: COASTAL AREA OF THE SANTA MONICA MOUNTAINS NORTH OF SUNSET BOULEVARD

LOCATION: SEE PLATE 6 IN THE PHOTO APPENDIX AND PAGE 40, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Rivas Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the south slope of the Santa Monica Mountains north of Sunset Boulevard where it passes adjacent to Will Rogers State Historic Park.

Districts' Conclusion

The Rivas Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Rivas Canyon site (Site 34, Table 1, Southside Canyons) was eliminated from further consideration based on its location inside of Rivas Canyon Park and adjacent to Topanga State Park and Will Rogers State Historic Park and the residential development at the mouth and throughout most of the canyon leading to the park. A landfill at this location would be incompatible with the recreational and residential uses which exist in the canyon and adjacent to the canyon (U1, U2, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Rivas Canyon (Plate 6, Photo Appendix) verifies the presence of the residences at the mouth of and throughout most of this canyon which justified eliminating this site (U5). Rivas Canyon is located north of Sunset Drive at the southeastern edge of Topanga State Park (C3). Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and recreational uses (U1, U2, U3 and U4). Utilization of Rivas Canyon for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

20. **SITE NAME:** ENCINO CREEK (HAVENHURST)

USGS QUADRANGLE: VAN NUYS

DESCRIPTION: URBAN AREA OF THE SAN FERNANDO VALLEY IN ENCINO

LOCATION: SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGES 14, 15, 21 AND 22, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Encino Creek site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the Sepulveda Dam Recreation Area north of the Ventura Freeway.

Districts' Conclusion

The Encino Creek site was eliminated from further consideration by the Districts during the initial screening process. The Encino Creek site (Site 20, Table 1, Northside Canyons) was eliminated from further consideration based on the site geology (S3) and the highly urbanized nature of the site (U1, U2, U3, U4 and U5) and the potential for the area to be flooded. A landfill at this location would be incompatible with the recreational and residential uses (U1, U2, and U3) which exist in the area and it would conflict with the flood control function the area serves, causing it to be displaced (U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Encino Creek site (Plate 7, Photo Appendix) verifies the presence of the extensive urban, flood control facility, and recreational development throughout the area which justified eliminating this site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential, flood management, and recreational uses (S3, U1, U2, U3, U5 and C3). Utilization of the Encino Creek site for a landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

21.	**SITE NAME:**	**BALLINA DRIVE**
	USGS QUADRANGLE:	**VAN NUYS**
	DESCRIPTION:	**URBAN AREA OF THE SAN FERNANDO VALLEY IN ENCINO**
	LOCATION:	**SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGE 22, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Ballina Drive site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the residential urban area in the southern portion of Encino south of the Ventura Freeway.

Districts' Conclusion

The Ballina Drive site was eliminated from further consideration by the Districts during the initial screening process. The Ballina Drive site (Site 19, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site which has homes and other urban uses occupying the area. A landfill at this location would be incompatible with the existing onsite and surrounding residential uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Ballina Drive site (Plate 7, Photo Appendix) verifies the presence of the extensive urban development throughout the area that would be used for a landfill which justified eliminating this site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses (U5) and severe conflicts with the surrounding and onsite residential uses (U1, U2 and U3) and along the transportation route (U4) along small surface streets. Utilization of the Ballina Drive site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

22.	SITE NAME:	STONE CANYON NORTH
	USGS QUADRANGLE:	VAN NUYS
	DESCRIPTION:	URBAN AREA OF THE SAN FERNANDO VALLEY IN SHERMAN OAKS EAST OF THE 405 FREEWAY
	LOCATION:	SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGE 22, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Stone Canyon North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the residential urban area in the southern portion of Sherman Oaks south of the Ventura Freeway, immediately downstream from Upper Stone Canyon Reservoir.

Districts' Conclusion

The Stone Canyon North site was eliminated from further consideration by the Districts during the initial screening process. The Stone Canyon North site (Site 17, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site and conflicts with the existing water supply reservoir. A landfill at this location would be incompatible with the existing onsite and surrounding residential uses which exist in the area and the existing use of most of the canyon for a water supply reservoir (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Stone Canyon North site (Plate 7, Photo Appendix) verifies the presence of the extensive urban development throughout the area where a landfill would be placed and the reservoir which justified eliminating this site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses (U5) and severe conflicts with the surrounding and onsite residential uses (U1, U2 and U3) and residential uses along the transportation route along small surface streets (U4). Utilization of the Stone Canyon North site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

23.	SITE NAME:	DIXIE CANYON
	USGS QUADRANGLE:	VAN NUYS
	DESCRIPTION:	URBAN AREA OF THE SAN FERNANDO VALLEY IN SHERMAN OAKS EAST OF THE 405 FREEWAY
	LOCATION:	SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Dixie Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the residential urban area in the southern portion of Sherman Oaks south of the Ventura Freeway and east of Woodman Avenue.

Districts' Conclusion

The Dixie Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Dixie Canyon site (Site 15, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets. A landfill at this location would be incompatible with the existing onsite and surrounding residential uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Dixie Canyon site (Plate 7, Photo Appendix) verifies the presence of the extensive urban development along the access route and surrounding the area considered for a landfill. The several thousand refuse trucks utilizing a regional landfill would wind their way to the site along Woodman Avenue which passes through extensive residential areas to the site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses (U5) and severe conflicts with the surrounding and onsite residential uses along the transportation route along small surface streets (U1, U2, U3 and U4). Utilization of the Dixie Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

24.	**SITE NAME:**	**WOODHILL CANYON**
	USGS QUADRANGLE:	**VAN NUYS**
	DESCRIPTION:	**URBAN AREA OF THE SAN FERNANDO VALLEY IN STUDIO CITY EAST OF THE 405 FREEWAY**
	LOCATION:	**SEE PLATE 8 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Woodhill Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the residential urban area in the southern portion of Studio City south of the Ventura Freeway and just west of Laurel Canyon Boulevard.

Districts' Conclusion

The Woodhill Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Woodhill Canyon site (Site 12, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of Wilacre Park within the canyon. A landfill at this location would be incompatible with the existing onsite and surrounding residential and recreational uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Woodhill Canyon site (Plate 8, Photo Appendix) verifies the presence of the extensive urban development throughout the area, including Wilacre Park, considered for the landfill. The several thousand refuse trucks would wind their way to the site along Laurel Canyon Boulevard which passes through extensive residential areas to the site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential uses along the transportation route along small surface streets (U1, U2, U3, U4, U5 and C3). Utilization of the Woodhill Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

25. **SITE NAME:** **FRYMAN CANYON/IREDELL CANYON**

USGS QUADRANGLE: **VAN NUYS**

DESCRIPTION: **URBAN AREA OF THE SAN FERNANDO VALLEY IN STUDIO CITY EAST OF THE 405 FREEWAY**

LOCATION: **SEE PLATE 8 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Fryman-Iredell Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in a residential urban area in the southern portion of Studio City south of the Ventura Freeway and just west and south of Laurel Canyon Boulevard.

Districts' Conclusion

The Fryman-Iredell Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Fryman-Iredell Canyon site (Site 13, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of Wilacre Park adjacent to the canyon on the north. A landfill at this location would be incompatible with the existing onsite and surrounding residential and recreational uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Fryman-Iredell Canyon site (Plate 8, Photo Appendix) verifies the presence of the extensive urban development throughout the area proposed for a landfill. The several thousand refuse trucks serving a regional landfill would wind their way to the site along Laurel Canyon Boulevard which passes through extensive residential areas to the site. The residential development has eliminated most of the area available for landfilling within the canyons. Developing a landfill at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential and along the transportation route (U1, U2, U3, U4 and U5). Utilization of the Fryman-Iredell Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

26.	**SITE NAME:**	**SEPULVEDA PASS**
	USGS QUADRANGLE:	**VAN NUYS**
	DESCRIPTION:	**TRANSPORTATION CORRIDOR BETWEEN COASTAL PLAIN AND THE SAN FERNANDO VALLEY; CONTAINS THE 405 FREEWAY**
	LOCATION:	**SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Sepulveda Pass site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the southern portion of the pass which is dominated by the 405 Freeway.

Districts' Conclusion

The Sepulveda Pass site was eliminated from further consideration by the Districts during the initial screening process. The Sepulveda Pass site (Site 18, Table 1, Northside Canyons) was eliminated from further consideration based on the presence of the 405 Freeway which is a major transportation corridor that cannot be rerouted. A landfill at this location would be incompatible with the existing onsite and surrounding transportation uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Sepulveda Pass site (Plate 7 of Appendix 7) verifies the presence of the freeway which justified eliminating this site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential uses at any new location selected for rerouting the 405 Freeway, assuming the transportation corridor could be relocated (U1, U2, U3, U4 and U5). Utilization of the Sepulveda Pass site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

27.	**SITE NAME:**	**SEPULVEDA PASS NORTH**
	USGS QUADRANGLE:	**VAN NUYS**
	DESCRIPTION:	**URBAN AREA OF THE SAN FERNANDO VALLEY CONTAINS THE 405 FREEWAY**
	LOCATION:	**SEE PLATE 7 IN THE PHOTO APPENDIX AND PAGE 22, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

<u>Site Summary</u>

The Sepulveda Pass North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the northern portion of the pass which is dominated by the 405 Freeway and adjacent urban development, including residential and commercial uses.

<u>Districts' Conclusion</u>

The Sepulveda Pass North site was eliminated from further consideration by the Districts during the initial screening process. The Sepulveda Pass North site (Site 18, Table 1, Northside Canyons) was eliminated from further consideration based on the presence of the 405 Freeway and intensely developed urban uses. The 405 Freeway is a major transportation corridor that cannot be rerouted. A landfill at this location would be incompatible with the existing onsite and surrounding transportation uses which exist in the area (U1, U2, U3 U4 and U5).

<u>Updated Review and Conclusion</u>

A review of the 1990 aerial photograph which includes the Sepulveda Pass North site (Plate 7, Photo Appendix) verifies the presence of the freeway and the intense urban uses which justified eliminating this site. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential uses at any new location selected for rerouting the 405 Freeway, assuming the corridor could be relocated (U1, U2, U3, U4 and U5). Utilization of the Sepulveda Pass North site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

28. **SITE NAME:** CONROCK GRAVEL PIT

USGS QUADRANGLE: VAN NUYS

DESCRIPTION: URBAN AREA OF THE SAN FERNANDO VALLEY NORTH OF THE INTERSTATE 5/HOLLYWOOD FREEWAY CONFLUENCE

LOCATION: SEE PLATE 9 IN THE PHOTO APPENDIX AND PAGE 9, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Conrock Gravel Pit site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located just north of the confluence of the Hollywood Freeway and Interstate 5 at an active sand and gravel mining location.

Districts' Conclusion

The primary reason for the Districts elimination of the Conrock Gravel Pit site was the inadequate geology (S3) to support landfilling operations at this location (see Page 295 of the Mission Canyon Landfill EIR). Urban conflicts were also a factor in eliminating this site (U1, U2, U3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Conrock Gravel Pit site (Plate 9 of Appendix A) verifies the presence of the existing gravel mining operation and the intense urban uses which justified eliminating this site. The site is surrounded by urban uses, including a Byrd Junior High School and residences that would create a land use incompatibility at this location. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing mining uses (U5), creating a violation of Regional Water Board regulations due to inadequate geological foundation (S3), and severe conflicts with the surrounding residential uses (U1, U2 and U3). Utilization of the Conrock Gravel Pit site for a regional landfill would create a land use incompatibility that could not be mitigated. The rejection of the Conrock Gravel Pit site has been further justified by the recent Los Angeles Regional Water Quality Control Board's adoption of regulations prohibiting siting new or expanding existing landfills within sand and gravel pits. Based on these deficiencies, the site was eliminated.

29. **SITE NAME:** **COLDWATER CANYON NORTH**

USGS QUADRANGLE: **VAN NUYS**

DESCRIPTION: **URBAN AREA OF THE SAN FERNANDO VALLEY IN STUDIO CITY EAST OF COLDWATER CANYON AVENUE**

LOCATION: **SEE PLATE 8 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Coldwater Canyon North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in a residential urban area in the southern portion of Studio City south of the Ventura Freeway and just west of Coldwater Canyon Avenue.

Districts' Conclusion

The Coldwater Canyon North site was eliminated from further consideration by the Districts during the initial screening process. The Coldwater Canyon North site (Site 14, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of a school near the site to the northeast. A landfill at this location would be incompatible with the existing onsite and surrounding residential and educational uses which exist in the area U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Coldwater Canyon North site (Plate 8, Photo Appendix) verifies the presence of the extensive urban development throughout the area proposed for a landfill. The several thousand refuse trucks would wind their way along Coldwater Canyon Avenue through extensive residential areas to the site (U4). Residential development surrounds the site on three sides of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Coldwater Canyon North site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

30.	**SITE NAME:**	**LAUREL CANYON NORTH**
	USGS QUADRANGLE:	**VAN NUYS**
	DESCRIPTION:	**URBAN AREA OF THE SAN FERNANDO VALLEY IN STUDIO CITY NORTH OF LAUREL CANYON BOULEVARD**
	LOCATION:	**SEE PLATE 8 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Laurel Canyon North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in a residential urban area in the southern portion of Studio City south of the Ventura Freeway and just north of Laurel Canyon Boulevard.

Districts' Conclusion

The Laurel Canyon North site was eliminated from further consideration by the Districts during the initial screening process. The Laurel Canyon North site (Site 11, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of residential development onsite and in the surrounding area. A landfill at this location would be incompatible with the existing onsite and surrounding residential which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Laurel Canyon North site (Plate 8, Photo Appendix) verifies the presence of the extensive urban development throughout the area. The several thousand refuse trucks delivering waste would wind their way along Laurel Canyon Boulevard through residential areas to the site (U4). Residential development surrounds the site on all sides of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing uses and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Laurel Canyon North site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

31. **SITE NAME:** **STONE CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 23, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Stone Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the crest of the Santa Monica Mountains east of the 405 Freeway and a large portion of this area is occupied by Stone Canyon Reservoir.

Districts' Conclusion

The Stone Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Stone Canyon site (Site 22, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of water storage reservoirs onsite which would preclude the siting of a landfill in the Canyon. A landfill at this location would be incompatible with the existing reservoir onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Stone Canyon site (Plate 10, Photo Appendix) verifies the presence of the extensive urban development throughout the area and the presence of two reservoirs in the Canyon that would have to be displaced (U5). The several thousand refuse trucks delivering waste would wind their way along Stone Canyon Road through residential areas to the site (U4). Residential development occupies the ridges to the west and east of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing essential water facilities and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2 and U3). Utilization of the Stone Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

32. **SITE NAME:** **COLDWATER CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **TROUSDALE ESTATES AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 11 IN THE PHOTO APPENDIX AND PAGE 33, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Coldwater Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in one of the major canyons traversing the Santa Monica Mountains between the Los Angeles coastal plain and the San Fernando Valley.

Districts' Conclusion

The Coldwater Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Coldwater Canyon site (Site 16, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of homes along the length of the canyon. A landfill at this location would be incompatible with the existing residences onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4, and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Coldwater Canyon site (Plate 11, Photo Appendix) verifies the presence of the extensive urban development throughout the area that would be used for a landfill. The several thousand refuse trucks delivering waste would wind their way to the site along local streets (including Sunset and/or Coldwater Canyon Drive) from either the Hollywood Freeway or the Ventura Freeway. The local road portion of the access passes through many miles of commercial and residential areas to the site (U4). Residential development occupies the ridges to the east of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing extensive residential areas and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Coldwater Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

33. **SITE NAME:** **KENTER CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **SANTA MONICA MOUNTAINS WEST OF 405 FREEWAY IN BRENTWOOD**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Kenter Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Kenter Canyon is located on the south slope of the Santa Monica Mountains west of the 405 Freeway in the northern portion of Brentwood.

Districts' Conclusion

Kenter Canyon passed the initial screening evaluation and was eliminated from further consideration in the second screening process. The Kenter Canyon site (Site 30, Table 1, Southside Canyons) was determined to have critical urban and conservation deficiencies (S4, C2, U1, U2, U3 and U4). The access and ecological critical deficiencies were identified in the 1980 Mission Canyon Landfill EIR, but these deficiencies were not listed in the 1987 Study. These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Feasible access exists through Bundy Canyon only. Lacking access, this site does not stand on its own as an alternative.

(b) Home of Lampropeltis zonata pulcha, a variety of King Snake that has been designated "depleted and protected"; habitat for this snake is limited.

The Districts identified only the urban conflicts (U1, U2, U3 and U4) in the 1987 review of alternatives.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Kenter Canyon site (Plate 10, Photo Appendix) verifies these critical deficiencies. To use Kenter Canyon as a regional landfill site, several thousand refuse trucks delivering waste to the site would be required to exit onto Sunset Boulevard from the 405 Freeway each day and travel west to Kenter Avenue and then through residential areas and Crestwood Hills Park. Alternatively, access would have to be taken through Bundy Canyon to the east. Without direct access the site has a critical access deficiency. Traffic on Kenter Avenue would pass through the local community (primarily residential areas) for more than two miles to reach the site (S4 and U5). Based on this access deficiency alone, the Kenter Canyon alternative was determined to be unsuitable as a regional landfill.

The proximity of the Kenter Canyon alternative site to existing residences located on the ridges near the mouth of the canyon also constitutes another critical deficiency (U1, U2 and U3). Several homes are located at the south end of the canyon and homes occupy the southern ridges along the perimeter of the canyon. These residences would be located directly adjacent to the landfill operation and Kenter Canyon does not have sufficient space to establish effective buffers, i.e. isolate the site. The County's General Plan continues to list the presence of an animal species of special concern (the king snake) that also created a critical deficiency for Kenter Canyon. These combined impacts made Kenter Canyon an unacceptable alternative site.

34. **SITE NAME:** **BUNDY CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **SANTA MONICA MOUNTAINS WEST OF 405 FREEWAY IN BRENTWOOD**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Bundy Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Bundy Canyon is located on the south slope of the Santa Monica Mountains west of the 405 Freeway and east of Kenter Canyon in the northern portion of Brentwood.

Districts' Conclusion

Bundy Canyon passed both the initial and secondary screening evaluations and was identified as one of six alternative sites for comparison with Mission Canyon. The Districts' staff and Advisory Committee reviewers concluded that Bundy Canyon had no critical deficiencies in 1980. As proposed at that time, access to the site would be through Mission Canyon Landfill, Canyon 8. In the rating process (see Figures 3, 4 and 5 in this document), Bundy Canyon was rated the second best of the five alternative sites to the expansion of Mission Canyon Landfill. The Districts noted several noncritical deficiencies which included the canyon's relatively undisturbed condition (there is no road in the canyon) and residences at the mouth of the canyon and at the head of the canyon (Mountain-Gate). Although these deficiencies were considered critical for some locations, the Districts staff and review panel did not conclude that these deficiencies were critical in 1980.

In the 1987 Districts' review of alternative locations, Bundy Canyon was determined to have urban critical deficiencies based on homes that have encroached into the canyon and on the surrounding ridges. Homes now occupy both ends of the canyon and landfill operations could not be isolated from residential land uses (U1, U2, U3 and U4).

Updated Review and Conclusion

A review and in the 1990 aerial photograph which includes the Bundy Canyon site (Plate 10, Photo Appendix) verifies these urban critical deficiencies. It is no longer possible to isolate a landfill from the residences since they now occupy both ends of the canyon. This poses compatibility, mitigability, and displacement issues (U1, U2, U3 and U5) that are so major as to make the site unsuitable. Further, access to the site will be along roads with residential neighborhoods (U4). Based on these deficiencies, Bundy Canyon is considered too urban and was eliminated from further consideration.

35. **SITE NAME:** **BROWNFIELD CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **SEPULVEDA PASS AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Brownfield Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located adjacent to the existing Mission Canyon Landfill at the south end adjacent to Canyon 8.

Districts' Conclusion

Brownfield Canyon passed both the initial and secondary screening evaluation and was identified as one of the six alternative sites for comparison with Mission Canyon. The Districts' staff and Advisory Committee reviewers concluded that Brownfield Canyon had no critical deficiencies in 1980. As proposed at that time, access to the site would be off of Sepulveda Boulevard along the same route to Mission Canyon Landfill. In the rating process (see Figures 3, 4 and 5 in this document), Brownfield Canyon was rated the third best of the five alternative sites to the expansion of Mission Canyon Landfill. The only noncritical deficiencies noted include the canyon's small size (4 million tons capacity), its steepness, and difficulty of screening the site from the ridge east of the 405 Freeway. Thus, in 1980 the only identified deficiency was capacity, which was not deemed a critical deficiency at that time.

In the 1987 Districts' review of alternative locations, Brownfield Canyon was disqualified from further consideration based on urban critical deficiencies (U1, U2, U3, U4 and U5) and capacity (less than one year as a regional landfill, S5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Brownfield Canyon site (Plate 10, Photo Appendix) verifies these urban critical deficiencies and the small size of the canyon. The very small volume of landfill capacity is an unavoidable critical deficiency at this location (S5). Residential development across the canyon has continued and it is not possible to isolate a landfill from the residences since they now occupy prominent visual access to the canyon (U1, U2 and U3). This poses compatibility and mitigability issues that are so major as to make the site unsuitable. Based on these deficiencies, Brownfield Canyon was considered too urban and is eliminated from further consideration.

36.	**SITE NAME:**	**METROPOLITAN CANYON (CANYON X)**
	USGS QUADRANGLE:	**BEVERLY HILLS**
	DESCRIPTION:	**SEPULVEDA PASS AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Metropolitan Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located adjacent to the existing Mission Canyon Landfill at the south end adjacent to Canyon 8.

Districts' Conclusion

Metropolitan Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Metropolitan Canyon (Site 25, Table 1, Southside Canyons) was determined to have a critical deficiency, lack of capacity (S5, 9 months capacity). This deficiency is described in Appendix G of the Final Mission Canyon EIR in the following manner:

Insufficient capacity (9 months) to act as an alternative solution.

The 1987 Study considered Metropolitan Canyon and eliminated from further consideration based on urban criteria (U1, U2 and U3). This was based on lack of adequate access and water storage facilties located in the small canyon.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Metropolitan Canyon site (Plate 10, Photo Appendix) verifies these critical deficiencies (S3, U1, U2 and U3). The lack of capacity issue makes the site unsuitable. Based on this deficiency, Metropolitan Canyon is eliminated from further consideration.

37.	**SITE NAME:**	**HOGG CANYON**
	USGS QUADRANGLE:	**BEVERLY HILLS**
	DESCRIPTION:	**BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Hogg Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Hogg Canyon is located west of the Beverly Glen area of the City of Los Angeles and just east of the 405 Freeway.

Districts' Conclusion

Hogg Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Hogg Canyon site (Site 26, Table 1, Southside Canyons) was determined to have critical deficiencies associated with urban development (U1, U2, U3, U4 and U5). These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

Homes are built on the surrounding ridges and the slopes are so steep that berms, etc for mitigation are impossible to build.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Hogg Canyon site (Plate 10, Photo Appendix) verifies these urban critical deficiencies. To use Hogg Canyon as a landfill site, the several thousand refuse trucks delivering waste would have to travel over several miles of local streets from the Rimerton Road or Sepulveda Boulevard off-ramps on the 405 Freeway. The traffic would pass through an area predominated by homes and a school, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Hogg Canyon alternative was determined to be unsuitable.

Hogg Canyon is surrounded by residences on both the east and west ridges adjacent to the site which is a critical deficiency for the site (U1, U2, U3 and U5). Homes are located at both ends of Hogg Canyon and along most of its perimeter. These residences are located in a manner that does not permit effective buffers to be established between residences and a regional landfill. It would not be possible to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts at this location. These impacts would be unacceptably high at this urban location for a regional landfill. Based on these deficiencies, Hogg Canyon is too urban and was eliminated from further consideration.

38.	SITE NAME:	ROSCOMARE ROAD (DRY CANYON)
	USGS QUADRANGLE:	BEVERLY HILLS
	DESCRIPTION:	BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS
	LOCATION:	SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Roscomare Road site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in one of the minor canyons traversing the Santa Monica Mountains between the Los Angeles coastal plain and the San Fernando Valley.

Districts' Conclusion

The Roscomare Road site was eliminated from further consideration by the Districts during the initial screening process. The Roscomare Road site (Site 23, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of homes along the length of the canyon. A landfill at this location would be incompatible with the existing residences onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Roscomare Road site (Plate 10, Photo Appendix) verifies the presence of the extensive urban development throughout the area where a landfill would be sited. The several thousand refuse trucks delivering waste would wind their way to the site along local streets (including Sunset Drive) from 405 Freeway. The local road portion of the access passes through many miles of residential areas within Dry Canyon along Roscomare Road (U4). Residential development occupies the ridges to the west and east of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing extensive residential areas and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Roscomare Road site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

39. SITE NAME: **BENEDICT CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Benedict Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in one of the major canyons traversing the Santa Monica Mountains between the Los Angeles coastal plain and the San Fernando Valley.

Districts' Conclusion

The Benedict Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Benedict Canyon site (Site 20, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of homes along the length of the canyon. A landfill at this location would be incompatible with the existing residences onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Benedict Canyon site (Plate 10, Photo Appendix) verifies the presence of the extensive urban development throughout the area where a landfill would be sited. The several thousand refuse trucks delivering waste would wind their way to the site along local streets (including Sunset Drive) from 405 Freeway or the Hollywood Freeway to Benedict Canyon Road. The local road portion of the access passes through many miles of residential areas to reach the canyon and also along Benedict Canyon Road (U4). Residential development occupies the ridges to the west and east of the canyon. Developing a regional landfill for the Los Angeles metropolitan area at this location would result in displacing extensive residential areas and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Benedict Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

40. SITE NAME: BENEDICT CANYON NORTH

USGS QUADRANGLE: BEVERLY HILLS

DESCRIPTION: BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGE 32, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Benedict Canyon North was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Benedict Canyon North is located in the Beverly Glen area of the Santa Monica Mountains.

Districts' Conclusion

Benedict Canyon North passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Benedict Canyon North (Site 16, Table 1, Northside Canyons) was determined to have critical urban deficiencies (U1, U2, U3, U4 and U5), including future a future park. These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Site is a "funded acquisition" for a park.

(b) Approximately 1 mile of narrow residential streets must be traversed after exiting the Ventura Freeway.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Benedict Canyon North site (Plate 10, Photo Appendix) verifies these urban critical deficiencies. To use Benedict Canyon North as a landfill site, the several thousand refuse trucks delivering waste would have to travel over several miles of local streets from the either the 405 Freeway or the Ventura Freeway, more than the one mile cited in the original evaluation. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Benedict Canyon North alternative location is unsuitable.

Benedict Canyon North (Site 16, Table 1, Northside Canyons) contains many residences and is surrounded by residences on both the east and west ridges adjacent to the site and this was also determined to be a critical deficiency for the site. A park has been created and is now established at this location (C3). Homes are located at both ends of this site and along most of its perimeter. These residences are located in a manner that does not permit effective buffers to be established between residences and a landfill. It would not be possible to mitigate the adverse impacts of dislocation and of odor, methane gas, noise, dust, vectors and visual impacts at this location. Based on these critical deficiencies (U1, U2, U3, U4 and U5), landfill impacts would be unacceptably high at this urban location and it was eliminated.

41. **SITE NAME:** **PEAVINE CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 10 IN THE PHOTO APPENDIX AND PAGES 32 AND 33, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Peavine Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in a minor canyon just east of Benedict Canyon and takes its access (San Ysidro Road) from Benedict Canyon Road.

Districts' Conclusion

The Peavine Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Peavine Canyon site (Site 19, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of homes along the length of the canyon. A landfill at this location would be incompatible with the existing residences onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Peavine Canyon site (Plate 10, Photo Appendix) verifies the presence of the extensive urban development throughout the area that would be used for a landfill. The several thousand refuse trucks delivering waste would wind their way to the site along local streets (including Sunset Drive) from 405 Freeway or the Hollywood Freeway to Benedict Canyon Road and San Ysidro Road. The local road portion of the access passes through many miles of residential areas to reach the canyon and also along two narrow, local roads leading into the canyon (U4). Residential development occupies the ridges to the west and east of the canyon. Developing a landfill at this location would result in displacing extensive residential areas (U5) and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2 and U3). Utilization of the Peavine Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated.

42. **SITE NAME:** HIGGINS CANYON

USGS QUADRANGLE: BEVERLY HILLS

DESCRIPTION: BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 11 IN THE PHOTO APPENDIX AND PAGE 33 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Higgins Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. Higgins Canyon is located in the Beverly Glen area of the Santa Monica Mountains.

Districts' Conclusion

Higgins Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Higgins Canyon (Site 18, Table 1, Southside Canyons) was determined to have critical urban deficiencies (U1, U2, U3, U4 and U5). These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Access from the San Diego Freeway via Mulholland or from the Ventura Freeway via either Beverly Glen or Coldwater Canyon would require traversing several miles of narrow and frequently steep residential streets.

(b) The site is within an area of "funded acquisition" for a park.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Higgins Canyon site (Plate 10, Photo Appendix) verifies these urban critical deficiencies. To use Higgins Canyon as a landfill site, several thousand refuse trucks delivering waste would have to travel over several miles of local streets from either the 405 Freeway or the Ventura Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Higgins Canyon alternative was determined to be unsuitable.

Higgins Canyon contains many residences and is surrounded by residences on both the east and west ridges adjacent to the site; this was also determined to be a critical deficiency for the site. Homes are located at both ends of Higgins Canyon and along most of its perimeter. These residences are located in a manner that does not permit effective buffers to be established between residences and a landfill. Since the EIR was prepared, portions of the canyon have been incorporated into the Santa Monica Mountains National Recreation Area (C3). Based on these critical deficiencies (U1, U2 U3, U4 and U5), landfill impacts would be unacceptably high at this urban location and it is eliminated as a suitable location for a regional landfill.

43. **SITE NAME:** **FRANKLIN CANYON**

USGS QUADRANGLE: **BEVERLY HILLS**

DESCRIPTION: **BEVERLY GLEN AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 11 IN THE PHOTO APPENDIX AND PAGE 33 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Franklin Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in a minor canyon just west of Coldwater Canyon Drive and takes its access from Coldwater Canyon and Beverly Drive.

Districts' Conclusion

The Franklin Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Franklin Canyon site (Site 17, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of water reservoirs and other critical infrastructure (U1, U2, U3, U4 and U5). A landfill at this location would be incompatible with the existing reservoirs onsite.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Franklin Canyon site (Plate 11, Photo Appendix) verifies the presence of two major water storage reservoirs in this canyon as well as a major storm water detention basin. Developing a regional landfill for the Los Angeles Metropolitan area at this location would result in displacing extensive water management infrastructure facilities. Utilization of the Franklin Canyon site for a landfill would create a land use incompatibility that could not be mitigated. Subsequent to the preparation of the EIR, the whole canyon was incorporated into the Santa Monica Mountains National Recreation Area (C3) which increases the incompatibility of use. Based on these deficiencies, the site is eliminated as a suitable location for a regional landfill.

44. **SITE NAME:** LAUREL CANYON

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: MOUNT OLYMPUS AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 11 IN THE PHOTO APPENDIX AND PAGE 33 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Laurel Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Laurel Canyon site is located north of Hollywood in the Santa Monica Mountains.

Districts' Conclusion

The Laurel Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Laurel Canyon site (Site 15, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of Laurel Canyon Park and the highly urbanized nature of the site, including poor access along local, steep winding streets, and the presence of homes along the length of these roads. A landfill at this location would be incompatible with the existing residences onsite and the surrounding area, including the existing park (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Laurel Canyon site (Plate 11, Photo Appendix) verifies these critical deficiencies. To use Laurel Canyon as a regional landfill site, several thousand refuse trucks delivering waste would have to travel over several miles of local streets from the Ventura Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Laurel Canyon alternative was determined to be unsuitable. The presence of an existing park facility (C3) creates an additional critical deficiency that justifies disqualifying the site (U1, U2, U3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it is eliminated as a suitable location for a regional landfill.

45. SITE NAME: **BALDWIN HILLS**

USGS QUADRANGLE: **BALDWIN HILLS**

DESCRIPTION: **NORTHEAST CORNER OF THE BALDWIN HILLS**

LOCATION: **SEE PLATE 12 IN THE PHOTO APPENDIX AND PAGE 50 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Baldwin Hills site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Baldwin Hills site is located in south central Los Angeles south of Interstate 10 and east of the 405 Freeway.

Districts' Conclusion

The Baldwin Hills site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Baldwin Hills site (not listed in Table 1) was determined to have the following critical deficiencies (S3, S6, U1, U2 and U3): acquirability, site preparation and displaced uses. These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Acquirability - Because of continuing oil recovery, site would be unavailable until the early 1990's.

(b) Preparation - proper sealing of oil wells and removal of pipes would be exorbitant in cost.

(c) Uses displaced - the producing oil field could not be displaced for landfilling.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Baldwin Hills site (Plate 12, Photo Appendix) verifies these critical deficiencies. The proposed landfill site is located within an oil producing area and this use would have to be displaced for the site to be used as a landfill (U5). The District concluded that this was also a critical acquirability deficiency (S1). Additionally, the costs to acquire the site and to properly seal the wells and prepare the site for landfill uses were also identified as critical deficiencies (S6). Not mentioned in the Districts' evaluation, but identified on the 1990 aerial photograph is the difficulty of achieving access to the site on Slauson and La Cienega through residential areas and the adjacent residential uses which would be incompatible with a landfill (U1, U2, U3 and U4). Based on these deficiencies, the Baldwin Hills site alternative was determined to be unsuitable for further consideration as a regional landfill.

46. **SITE NAME:** NICHOLS CANYON

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: MOUNT OLYMPUS AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 11 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Nichols Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Nichols Canyon site is located north of Hollywood in the Santa Monica Mountains.

Districts' Conclusion

The Nichols Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Nichols Canyon site (Site 14, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including poor access along local, steep winding streets, and the presence of homes along the length of these roads. A landfill at this location would be incompatible with the existing residences onsite and on the ridges to the west, north and east of the canyon (U1, U2, U3 U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Nichols Canyon site (Plate 11, Photo Appendix) verifies these urban critical deficiencies. To use Nichols Canyon as a landfill site, several thousand refuse trucks delivering waste would have to travel over several miles of local streets from the Ventura Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Nichols Canyon alternative was determined to unsuitable. In addition, the floor of the canyon is occupied by residences, the mouth of the canyon opens onto Hollywood Boulevard and a residential area, and residences are located on all three ridgelines (west, north, and east) that surround the canyon. Landfill operations would create a significant conflict with these residential uses and would expose them to noise, odors, dust, and related activities that are completely incompatible with the existing uses (U1, U2, U3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it is eliminated as a suitable location for a regional landfill.

47. **SITE NAME:** **CURSON CANYON**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **MOUNT OLYMPUS AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 33 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Curson Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Nichols Canyon site is located north of Hollywood in the Santa Monica Mountains.

Districts' Conclusion

Curson Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Curson Canyon (Site 13, Table 1, Southside Canyons) was determined to have urban critical deficiencies (U1, U2, u3, U4 and U5). These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Access would require travel along 1 to 2 miles of residential streets and depending on route, road width and grade could cause problems for larger refuse trucks.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Curson Canyon site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use Curson Canyon as a landfill site, several thousand refuse trucks delivering waste would have to travel over several miles of local streets from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Curson Canyon alternative was determined to be unsuitable.

The Curson Canyon site contains many residences and is surrounded by residences on both the south and north sides of the canyon. This urban use of the site and surrounding area also constitutes a critical deficiency for the site. These residences are located in a manner that does not permit effective buffers to be established between residences and a landfill (U1, U2, U3 and U5). Based on these critical deficiencies, regional landfill impacts would be unacceptably high at this urban location and it is eliminated as a suitable location for a regional landfill.

48. **SITE NAME:** **RUNYON CANYON**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **MOUNT OLYMPUS AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Runyon Canyon was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Runyon Canyon site is located north of Hollywood in the Santa Monica Mountains.

Districts' Conclusion

Runyon Canyon passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. Runyon Canyon (Site 12, Table 1, Southside Canyons) was determined to have urban critical deficiencies, including future use as a park (U1, U2, U3 U4, U5 and C3). These deficiencies are described in Appendix G of the Final Mission Canyon EIR in the following manner:

(a) Site is a "funded acquisition" for a park.

(b) Access from Hollywood Freeway would require that refuse trucks traverse hilly, residential streets.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Runyon Canyon site (Plate 13, Photo Appendix) verifies these critical deficiencies. To use Runyon Canyon as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Runyon Canyon alternative was determined to be unsuitable.

Runyon Canyon contains no residences but residences are found at both ends of the canyon. Use of the site for a landfill also constitutes a critical deficiency due to conflicts with these surrounding residential uses. These residences are located in a manner that does not permit effective buffers to be established between residences and a landfill (U1, U2 and U3). Since the EIR was prepared, Runyon Canyon has been purchased and Runyon Canyon Park has been established. The conflicts between recreational uses and landfill activities was also judged to be a critical deficiency (U5 and C3). Based on these critical deficiencies, regional landfill impacts would be unacceptably high at this urban location and it is eliminated as a suitable location for a regional landfill.

49. SITE NAME: **OUTPOST DRIVE**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **HOLLYWOOD AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Outpost Drive site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The Outpost Drive site is located in Hollywood in the Santa Monica Mountains.

Districts' Conclusion

The Outpost Drive site was eliminated from further consideration by the Districts during the initial screening process. The Outpost Drive site (Site 11, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including poor access along local, steep winding streets, and the presence of homes along the length of these roads. A landfill at this location would be incompatible with the existing residences onsite and on the ridges to the west, north and east of the canyon (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Outpost Drive site (Plate 13 of Appendix A) verifies these urban critical deficiencies. To use the Outpost Drive site as a regional landfill site, several thousand refuse trucks delivering waste would have to travel over a mile of local streets from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Outpost Drive alternative was determined to unsuitable.

In addition, the floor and east ridge of the canyon is occupied by hundreds of residences, the mouth of the canyon opens onto a residential area, and residences are located on two ridgelines (north and east) that surround the canyon. Regional landfill operations would create a significant conflict with these residential uses and would expose them to noise, odors, dust, and related activities that are completely incompatible with the existing uses (U1, U2, U3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

50. SITE NAME: CAHUENGA PASS

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: TRANSPORTATION CORRIDOR BETWEEN COASTAL PLAIN AND THE SAN FERNANDO VALLEY; CONTAINS THE HOLLYWOOD (101) FREEWAY

LOCATION: SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Cahuenga Pass site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the central portion of the pass which is dominated by the Hollywood (101) Freeway.

Districts' Conclusion

The Cahuenga Pass site was eliminated from further consideration by the Districts during the initial screening process. The Cahuenga Pass site (Site 10, Table 1, Southside Canyons) was eliminated from further consideration based on the presence of the Hollywood Freeway which is a major transportation corridor that cannot be rerouted (U1, U2, U3, U4 and U5). A landfill at this location would be incompatible with the existing onsite and surrounding transportation uses which exist in the area.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Cahuenga Pass site (Plate 13, Photo Appendix) verifies the presence of the freeway which justified eliminating this site. Developing a landfill at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential uses at any new location selected for rerouting the Hollywood Freeway, assuming the corridor could be relocated (U1, U2 and U3). Utilization of the Cahuenga Pass site for a landfill would create a land use incompatibility that could not be mitigated (U4 and U5). Based on these deficiencies, the site was eliminated as a suitable location for a regional landfill.

51. SITE NAME: CANYON DRIVE

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Canyon Drive site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located north of Hollywood adjacent to and within Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Canyon Drive site was eliminated from further consideration by the Districts during the initial screening process. The Canyon Drive site (Site 7, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local narrow urban streets, and the location of the upper portion of the site within Griffith Park which would preclude the siting of a landfill at this site (U1, U2, U3, U4 and U5). A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exists in the area.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Canyon Drive site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Hollywood Boulevard and Canyon Drive) from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including narrow road. Based on the access deficiency alone (U4), the Canyon Drive alternative was determined to be unsuitable. The site's location within Griffith Park creates additional critical deficiencies (U2, U3 and U5) with conflicts between recreational uses (C3) and landfill activities. Based on these critical deficiencies, regional landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

52. **SITE NAME:** **HOLLY CANYON**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **HOLLYWOOD AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGES 24 AND 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Holly Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on the crest of the Santa Monica Mountains east of the Hollywood Freeway and a large portion of this area is occupied by Hollywood Reservoir.

Districts' Conclusion

The Holly Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Holly Canyon site (Site 9, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, steep winding streets, and the presence of a major water storage reservoir onsite which would preclude the siting of a landfill in the Canyon. A landfill at this location would be incompatible with the existing reservoir onsite and the surrounding residential use which exists in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Holly Canyon site (Plate 13, Photo Appendix) verifies the presence of the extensive urban development throughout the area and the presence of the reservoir which would have to be displaced to use the canyon as a landfill (U5). The several thousand refuse trucks delivering waste would wind their way to the site along Barham Boulevard which passes through residential areas to the site (U4). Residential development occupies the ridges to the west and east of the canyon. Developing a landfill at this location would result in displacing essential water facilities and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2 and U3). Utilization of the Holly Canyon site for a regional landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated as a suitable location for a regional landfill.

53.	**SITE NAME:**	**FERN DELL DRIVE/WESTERN CANYON**
	USGS QUADRANGLE:	**HOLLYWOOD**
	DESCRIPTION:	**GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Fern Dell Drive/Western Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located north of Hollywood in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Fern Dell Drive/Western Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Fern Dell Drive/Western Canyon site (Site 8, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local, steep winding streets, and the location of the upper portion of the site within Griffith Park which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exists in the area (U1, U2, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Fern Dell Drive/Western Canyon site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use this site as a regional landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Western Avenue) from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including steep roads with narrow turns. Based on the access deficiency alone (U4), the Fern Dell Drive/Western Canyon alternative was determined to be unsuitable.

The site's location within Griffith Park creates additional critical deficiencies with conflicts between recreational uses and landfill activities (U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

54. **SITE NAME:** **VERMONT CANYON**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Vermont Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the Los Feliz area in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Vermont Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Vermont Canyon site (Site 5, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local, steep winding streets, and the location of the site within Griffith Park which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exists in the area (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Vermont Canyon site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Vermont Avenue) from the Hollywood Freeway. The traffic would pass through an area predominantly residential. Based on the access deficiency alone (U4), the Vermont Canyon alternative was determined to be unsuitable.

The site's location within Griffith Park creates additional critical deficiencies with conflicts between recreational uses and landfill activities (U1, U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

55. SITE NAME: **ABERDEEN CANYON**

USGS QUADRANGLE: **HOLLYWOOD**

DESCRIPTION: **GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 14 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Aberdeen Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the Los Feliz area in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Aberdeen Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Aberdeen Canyon site (Site 4, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local urban streets, and the location of the site within Griffith Park which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exists in the area (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Aberdeen Canyon site (Plate 14 of Appendix d) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Los Feliz Boulevard) from the Golden State Freeway. The traffic would pass through an area predominantly residential. Based on the access deficiency alone (U4), the Aberdeen Canyon alternative was determined to be unsuitable.

The site's location within Griffith Park creates additional critical deficiencies with conflicts between recreational uses and landfill activities (U1, U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

56.	**SITE NAME:**	**COMMONWEALTH CANYON**
	USGS QUADRANGLE:	**HOLLYWOOD**
	DESCRIPTION:	**GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGES 25 AND 35 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Commonwealth Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the Los Feliz area in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Commonwealth Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Commonwealth Canyon site (Site 1, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local urban streets, and the location of the site within Griffith Park (contains Roosevelt Golf Course) which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exists in the area (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Commonwealth Canyon site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Los Feliz Boulevard) from the Golden State Freeway. The traffic would pass through an area predominantly residential. Based on the access deficiency alone (U4), the Commonwealth Canyon alternative was determined to be unsuitable.

The site's location within Griffith Park creates additional critical deficiencies with conflicts between recreational uses and landfill activities (U1, U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

57. SITE NAME: SILVER LAKE RESERVOIR

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: SILVER LAKE AREA OF LOS ANGELES

LOCATION: SEE PLATE 14 IN THE PHOTO APPENDIX AND PAGE 35 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Silver Lake Reservoir site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located on just west of the Golden State Freeway/Pasadena Freeway interchange and the whole site is occupied by Silver Lake Reservoir.

Districts' Conclusion

The Silver Lake Reservoir site was eliminated from further consideration by the Districts during the initial screening process. The Silver Lake Reservoir site (Site 3, Table 1, Southside Canyons) was eliminated from further consideration based on the highly urbanized nature of the site, including access along local, urban streets, and the presence of a major water storage reservoir onsite which would preclude the siting of a landfill in the Canyon. A landfill at this location would be incompatible with the existing reservoir onsite and the surrounding residential use which exists in the area (S3, U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Silver Lake Reservoir site (Plate 14, Photo Appendix) verifies the presence of the extensive urban development which totally surrounds the reservoir and the presence of the reservoir which would be displaced by a landfill. The several thousand refuse trucks delivering waste would wind their way to the site along Glendale Boulevard and Silver Lake Boulevard which pass through residential areas to the site. Residential development occupies all areas surrounding the reservoir. Developing a landfill at this location would result in displacing essential water facilities and in creation of severe conflicts with the surrounding residential uses and those uses along the transportation route on small surface streets (U1, U2, U3 and U5). Utilization of the Silver Lake Reservoir site for a landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated as a suitable location for a regional landfill.

58. SITE NAME: MID CITY GRANITE

USGS QUADRANGLE: HOLLYWOOD

DESCRIPTION: GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 13 IN THE PHOTO APPENDIX AND PAGE 34 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Mid City Granite site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located north of Hollywood within the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Mid City Granite site was eliminated from further consideration by the Districts during the initial screening process. The Mid City Granite site (Table 1, Pits and Quarries Surveyed) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local narrow urban streets, and the location of the site within Griffith Park which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing park and recreation uses and the surrounding residential use which exist along the access route to the site (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Mid City Granite site (Plate 13, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Hollywood Boulevard and Canyon Drive) from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including narrow roads. Based on the access deficiency alone (U4), the Mid City Granite alternative was determined to be unsuitable.

The site's location within Griffith Park creates additional critical deficiencies with conflicts between recreational uses and landfill activities (U1, U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

59. **SITE NAME:** HOLLY CANYON NORTH

USGS QUADRANGLE: BURBANK

DESCRIPTION: GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS

LOCATION: SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Holly Canyon North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located north of Hollywood within the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Holly Canyon North site was eliminated from further consideration by the Districts during the initial screening process. The Holly Canyon North site (Site 4, Table 1, Northside Canyons) was eliminated from further consideration based on the urbanized entrance to the site, including access along local, steep narrow streets, and the location of the site being upstream of the Hollywood Reservoir which would preclude the siting of a landfill at this site. A landfill at this location would be incompatible with the existing domestic water supply reservoir downstream of the site and the surrounding residential use which exist along the access route to the site (U1, U2, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Holly Canyon North site (Plate 15, Photo Appendix) verifies these critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Barham Boulevard) from the Hollywood Freeway. The traffic would pass through an area predominantly residential, including narrow roads. Based on the access deficiency alone (U4), the Holly Canyon North site alternative was determined to be unsuitable.

The site's location upstream of a major water supply reservoir creates additional critical deficiencies with conflicts between landfill activities and water quality in the reservoir (U1, U2, U3, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

60. **SITE NAME:** **CAHUENGA PASS NORTH**

USGS QUADRANGLE: **BURBANK**

DESCRIPTION: **TRANSPORTATION CORRIDOR BETWEEN COASTAL PLAIN AND THE SAN FERNANDO VALLEY; CONTAINS THE HOLLYWOOD (101) FREEWAY**

LOCATION: **SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Cahuenga Pass North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the northern portion of the pass which is dominated by the Hollywood (101) Freeway.

Districts' Conclusion

The Cahuenga Pass North site was eliminated from further consideration by the Districts during the initial screening process. The Cahuenga Pass North site (Site 10, Table 1, Northside Canyons) was eliminated from further consideration based on the presence of the Hollywood Freeway which is a major transportation corridor that cannot be rerouted. A landfill at this location would be incompatible with the existing onsite and surrounding transportation uses which exist in the area (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Cahuenga Pass North site (Plate 15, Photo Appendix) verifies the presence of the freeway which justified eliminating this site. Developing a landfill at this location would result in displacing uses and severe conflicts with the surrounding and onsite residential uses (U1, U2 and U3) at any new location selected for rerouting the Hollywood Freeway, assuming the corridor could be relocated (U4 and U5). Utilization of the Cahuenga Pass North site for a landfill would create a land use incompatibility that could not be mitigated. Based on these deficiencies, the site was eliminated as a suitable location for a regional landfill.

61.	**SITE NAME:**	**COYOTE CANYON**
	USGS QUADRANGLE:	**BURBANK**
	DESCRIPTION:	**UNIVERSAL CITY AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Coyote Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located east of Universal City adjacent to the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Coyote Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Coyote Canyon site (Site 9, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, including access along local narrow urban streets, and residences overlooking the site from ridges on the west and south. A small reservoir is also located within the canyon downstream from the proposed location. A landfill at this location would be incompatible with the water storage uses and the surrounding residential use which exist on the ridges above the site (U1, U3 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Coyote Canyon site (Plate 15, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over 0.5 miles of local streets (Barham Boulevard) from the Hollywood Freeway. The traffic would pass through an area with industrial and residential uses, including narrow roads (U4). The Coyote Canyon alternative was determined to be unsuitable because it would not be possible to mitigate adverse effects from odor, methane gas, noise, dust, vectors and visual impacts to the residences on surrounding ridges (U1, U2, U3 and U5).

The site's location within a canyon that contains a reservoir creates an additional critical deficiency with conflicts between water infrastructure uses and landfill activities. Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

62.	**SITE NAME:**	**CAHUENGA PEAK NORTH**
	USGS QUADRANGLE:	**BURBANK**
	DESCRIPTION:	**GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Cahuenga Peak North site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located just south of Forest Lawn Cemetery in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Cahuenga Peak North site was eliminated from further consideration by the Districts during the initial screening process. The Cahuenga Peak North site (Site 8, Table 1, Northside Canyons) was eliminated from further consideration based on the highly urbanized entrance to the site, through Forest Lawn Memorial Park. A landfill at this location would be incompatible with the existing cemetery uses at this location (U1, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Cahuenga Peak North site (Plate 15, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one or two miles of local streets (Forest Lawn Drive) from the Hollywood or Ventura Freeways. The traffic would pass through an area with industrial and residential uses. The last portion of the site would require access directly through the Forest Lawn cemetery. Based on the access deficiency alone (U4), the Cahuenga Pass North site alternative was determined to be unsuitable to be carried forward in the alternative evaluation process. Additional neighborhood conflicts and potential displacement (U1, U3 and U5) create unacceptably high impacts at this urban location and it was eliminated as a suitable location for a regional landfill.

63.	SITE NAME:	SENNET CANYON
	USGS QUADRANGLE:	BURBANK
	DESCRIPTION:	GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS
	LOCATION:	SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Sennet Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located within Forest Lawn Memorial Park cemetery in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Sennet Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Sennet Canyon site (Site 7, Table 1, Northside Canyons) was eliminated from further consideration based on its location within the cemetery and the highly urbanized entrance to the site, through Forest Lawn Memorial Park. A landfill at this location would be incompatible with the existing cemetery uses at this location (U1, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Sennet Canyon site (Plate 15, of Appendix) verifies these critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering wastes would have to travel over one or two miles of local streets (Forest Lawn Drive) from the Hollywood or Ventura Freeways (U1, U3 and U5). The traffic would pass through an area with industrial and residential uses. The last portion of the site would require access directly through the Forest Lawn cemetery. Based on the access deficiency alone (U4), the Sennet Canyon site alternative was determined to be unsuitable.

The dislocation of existing cemetery facilities is an additional critical deficiency (U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

64.	SITE NAME:	BRUSH CANYON
	USGS QUADRANGLE:	BURBANK
	DESCRIPTION:	GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS
	LOCATION:	SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Brush Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located within Griffith Park in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Brush Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Brush Canyon site (Site 6, Table 1, Southside Canyons) was eliminated from further consideration based on its location within the park and the highly urbanized entrance to the site, through residential areas to the south, Canyon Drive. A landfill at this location would be incompatible with the existing park and recreational uses at this location (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Brush Canyon site (Plate 15 of Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one to two miles of local streets (Canyon Drive) from the Hollywood Freeway (U1 and U3). The traffic would pass through an area with intensive residential uses. The last portion of the site would require access directly through and into Griffith Park. Based on the access deficiency alone (U4), the Brush Canyon site alternative was determined to be unsuitable.

The dislocation of existing park and recreation uses creates additional critical deficiencies (C3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

65. SITE NAME:	**GRIFFITH PARK BOY'S CAMP**
USGS QUADRANGLE:	**BURBANK**
DESCRIPTION:	**GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**
LOCATION:	**SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Griffith Park Boy's Camp site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located within Griffith Park in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Griffith Park Boy's Camp site was eliminated from further consideration by the Districts during the initial screening process. The Griffith Park Boy's Camp site (Site 5, Table 1, Northside Canyons) was eliminated from further consideration based on its location within the park and the highly urbanized entrance to the site, through Griffith Park and the Wilson and Harding Golf Courses. A landfill at this location would be incompatible with the existing park and recreational uses at this location (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Griffith Park Boy's Camp site (Plate 15, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one to two miles of local streets (Griffith Park Drive) from the Ventura Freeway. The traffic would pass through an area with park and recreation activities, two golf courses (U1 and U3). Based on the access deficiency alone (U4), the Griffith Park Boy's Camp site alternative was determined to be unsuitable.

The dislocation of existing park and recreation uses creates additional critical deficiencies (C3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

66. **SITE NAME:** **SPRING CANYON**

USGS QUADRANGLE: **BURBANK**

DESCRIPTION: **GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**

LOCATION: **SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Spring Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located within Griffith Park in the Griffith Park portion of the Santa Monica Mountains.

Districts' Conclusion

The Spring Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Spring Canyon site (Site 3, Table 1, Northside Canyons) was eliminated from further consideration based on its location within the park and the highly urbanized entrance to the site, through Griffith Park and the Wilson and Harding Golf Courses. A landfill at this location would be incompatible with the existing park and recreational uses at this location (U1, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Spring Canyon site (Plate 15, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one to two miles of local streets (Los Feliz Boulevard and Griffith Park Drive) from the Golden State Freeway (U1 and U3). The traffic would pass through an area with park and recreation activities, two golf courses. Based on the access deficiency alone (U4), the Spring Canyon site alternative was determined to be unsuitable.

The dislocation of existing park and recreation uses creates additional critical deficiencies (C3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable locationfor a regional landfill.

67.	**SITE NAME:**	**FERN CANYON**
	USGS QUADRANGLE:	**BURBANK**
	DESCRIPTION:	**GRIFFITH PARK AREA OF THE SANTA MONICA MOUNTAINS**
	LOCATION:	**SEE PLATE 16 IN THE PHOTO APPENDIX AND PAGE 25 1989 LOS ANGELES COUNTY THOMAS GUIDE**

__Site Summary__

The Fern Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located within Griffith Park in the Griffith Park portion of the Santa Monica Mountains.

__Districts' Conclusion__

The Fern Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Fern Canyon site (Site 2, Table 1, Northside Canyons) was eliminated from further consideration based on its location within the park and the highly urbanized entrance to the site, through Griffith Park and the Wilson and Harding Golf Courses. A landfill at this location would be incompatible with the existing park and recreational uses at this location (U1, U3, U4, U5 and C3).

__Updated Review and Conclusion__

A review of the 1990 aerial photograph which includes the Fern Canyon site (Plate 15 of Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site, several thousand refuse trucks delivering waste would have to travel over one to two miles of local streets (Los Feliz Boulevard and Griffith Park Drive) from the Golden State Freeway (U1 and U3). The traffic would pass through an area with park and recreation activities, two golf courses. Based on the access deficiency alone (U4), the Fern Canyon site alternative was determined to be unsuitable.

The dislocation of existing park and recreation uses creates additional critical deficiencies (C3 and U5). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

68.	SITE NAME:	CHAVEZ RAVINE
	USGS QUADRANGLE:	LOS ANGELES
	DESCRIPTION:	ECHO PARK AREA OF LOS ANGELES
	LOCATION:	SEE PLATE 14 IN THE PHOTO APPENDIX AND PAGE 35 1989 LOS ANGELES COUNTY THOMAS GUIDE

<u>Site Summary</u>

The Chavez Ravine site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located just west of and adjacent to the Pasadena and Golden State Freeway interchange.

<u>Districts' Conclusion</u>

The Chavez Ravine site was eliminated from further consideration by the Districts during the initial screening process. The Chavez Ravine site (Site 1, Table 1, Southside Canyons) was eliminated from further consideration based on its location adjacent to and in Dodger Stadium and within Elysian Park. A landfill at this location would be incompatible with the existing park and recreational uses at this location. It was also concluded that the time and costs of acquisition would be too great (U1, U2, U3, U4 and U5).

<u>Updated Review and Conclusion</u>

A review of the 1990 aerial photograph which includes the Chavez Ravine site (Plate 14, Photo Appendix) verifies these urban critical deficiencies. Residential uses surround the park and stadium area through which the landfill traffic would have to pass. To use this site as a landfill site would cause dislocation of existing residential, park and recreation uses and conflict with a major sports recreation center of the City, Dodger Stadium (U1, U2, U3, U4, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

69.	**SITE NAME:**	**STADIUM WAY**
	USGS QUADRANGLE:	**LOS ANGELES**
	DESCRIPTION:	**ECHO PARK AREA OF LOS ANGELES**
	LOCATION:	**SEE PLATE 14 IN THE PHOTO APPENDIX AND PAGE 35 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Stadium Way site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located just west of and adjacent to the Pasadena and Golden State Freeway interchange.

Districts' Conclusion

The Stadium Way site was eliminated from further consideration by the Districts during the initial screening process. The Stadium Way site (Site 2, Table 1, Southside Canyons) was eliminated from further consideration based on its location within Elysian Park and just north and west of Dodger Stadium. A landfill at this location would be incompatible with the existing park and recreational uses at this location (U1, U2, U3, U4, U5 and C3).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Stadium Way site (Plate 14, Photo Appendix) verifies these urban critical deficiencies. To use this site as a landfill site would cause dislocation of existing residential, park and recreation uses and conflict with a major sports recreation center of the City, Dodger Stadium (U1, U2, U3, U4, U5 and C3). Based on these critical deficiencies, landfill impacts would be unacceptably high at this urban location and it was eliminated as a suitable location for a regional landfill.

70. SITE NAME: LA QUESTA LADO

USGS QUADRANGLE: TORRANCE

DESCRIPTION: CITY OF CARSON, EAST OF THE HARBOR FREEWAY AND SOUTH OF SEPULVEDA BOULEVARD

LOCATION: SEE PLATE 17 IN THE PHOTO APPENDIX AND PAGE 70 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The La Questa Lado site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. The La Questa Lado site is located in the City of Carson east of the Harbor Freeway and between Sepulveda Boulevard and Lomita Boulevard.

Districts' Conclusion

The La Questa Lado site was eliminated from further consideration by the Districts during the initial screening process. The La Questa Lado site (discussed on page 303 of the Mission Canyon Landfill EIR) was identified as having the following critical deficiencies: inadequate cover material at the site, inadequate capacity for a landfill, haul time, and urban conflicts (S1, S2, S6, and U1, U2 and U3). The acquirability (S1), haul time (S2) and preparation (S6) critical deficiencies were identified in the 1980 Mission Canyon Landfill EIR but were not listed in the 1987 Study.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the La Questa Lado site (Plate 17, Photo Appendix) verifies these critical deficiencies. La Questa Lado has inadequate geology for a regional landfill as it is in an alluvial plain (S3). It also has inadequate area to provide sufficient cover material and disposal space for a regional landfill operation (S1 and S2). The site was evaluated as "The capacity of La Questa Lado is estimated to be approximately 4 million tons and cover availability is very limited." The Districts concluded that these inadequacies constitute critical deficiencies for this site and it is concluded under the present review they remain so under present conditions. Additionally, the site is presently occupied by heavy industrial uses including a refinery and the costs to acquire the site would be prohibitive and this was also identified as critical deficiency (S6). Landfill activities would conflict with the surrounding residential and industrial land uses that currently surround the site (U1, U2 and U3). Based on these deficiencies, the La Questa Lado site alternative was determined to be unsuitable. It was eliminated as a suitable location for a regional landfill.

71. **SITE NAME:** **U.S. NAVAL RESERVATION**

USGS QUADRANGLE: **TORRANCE**

DESCRIPTION: **EAST RANCHO PALOS VERDES, WEST OF THE HARBOR FREEWAY**

LOCATION: **SEE PLATE 18 IN THE PHOTO APPENDIX AND PAGE 73 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The U. S. Naval Reservation site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located just east of Rancho Palos Verdes and west of the Harbor Freeway south of Vermont Avenue.

Districts' Conclusion

The U. S. Naval Reservation site was eliminated from further consideration by the Districts during the initial screening process. The U. S. Naval Reservation site (discussed on pages 302 and 303 of the Mission Canyon Landfill EIR) was identified as having the following critical deficiencies: lack of acquirability, haul time, preparation, and urban conflicts (S1, S2, S6 and U2 and U3). In the 1987 Study the Districts listed all urban critical deficiencies (U1, U2, U3 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the U. S. Naval Reservation site (Plate 18, Photo Appendix) verifies these critical deficiencies. The site was evaluated as "The Navy has indicated a desire to retain the site, thus preventing possible landfill activity." This makes it improbably that the site can be acquired even today (S1). The evaluation also identified the site as requiring approximately 2 hours of haul time from within the wasteshed. The Reservation site remains approximately two hours from the metropolitan areas waste centroid near downtown Los Angeles and this continues to be a major critical deficiency (S2). Finally, the evaluation in the EIR stated: "Subterranean installations, such as oil wells and pipes, tanks and pipes, and trunk pipelines respectively, would require an exorbitant amount of preparatory work at these sites." Based on the updated review, these site constraints continue to constitute critical deficiencies (S1, S2, S6 and U2 and U3) for this site. Additionally, the site is presently surrounded on three sides (north, west and south) by residential uses. It would not be possible to isolate these residential areas, which are higher on the hills, from the adverse impacts from odors, methane gas, noise, dust, vectors, and visual impacts (U1 and U3). Based on these deficiencies, the U. S. Naval Reservation site alternative was determined to be unsuitable. It was eliminated as a suitable location for a regional landfill

72.	SITE NAME:	CHANDLER'S PIT
	USGS QUADRANGLE:	TORRANCE
	DESCRIPTION:	ROLLING HILLS ESTATES, JUST SOUTH OF LOMITA FREEWAY
	LOCATION:	SEE PLATE 18 IN THE PHOTO APPENDIX AND PAGE 73 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Chandler's Pit site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located in the northern portion of Rancho Palos Verdes, just south of Lomita.

Districts' Conclusion

The Chandler's Pit site was eliminated from further consideration by the Districts during the initial screening process. The Chandler's Pit site (discussed on page 302 of the Mission Canyon Landfill EIR) was identified as having the following critical deficiencies: haul time, unacceptable geology, and urban conflicts (S2, S3 and U2 and U3). In the 1987 Study the Districts listed urban critical deficiencies U1 and U3 for this location.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Chandler's Pit site (Plate 18, Photo Appendix) verifies these critical deficiencies. The site was evaluated as requiring approximately 2 hours of haul time which remains valid (S2). The original evaluation also stated: "The Regional Water Quality Control Board rejected a previous application for a change of status to a Class II site because of doubtful ability to protect groundwater." This geologic substrate inadequacy is more valid today given the Regional Board's recent policy statement (S3). The Districts concluded that these inadequacies constitute critical deficiencies for this site and based on the updated review, they remain valid today (S2, S3 and U2 and U3). Additionally, the site is presently surrounded on sides by residential and recreational (Rolling Hills Country Club Golf Course) uses (U1, U2, and U3). It would not be possible to isolate these residential areas, which are higher on the hills, from the adverse impacts from odors, methane gas, noise, dust, vectors, and visual impacts. Based on these deficiencies, the Chandler's Pit site alternative was determined to be unsuitable. It was eliminated as a suitable location for a regional landfill.

73. SITE NAME: **FULLERTON ROAD (CANYON 550)**

USGS QUADRANGLE: **LA HABRA**

DESCRIPTION: **URBAN AREA AND CONSERVATION AREA IN THE SOUTH PUENTE HILLS, LA HABRA HEIGHTS**

LOCATION: **SEE PLATE 19 IN THE PHOTO APPENDIX AND PAGES 98 AND 98A 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Fullerton Road site was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This site is located just north of the Orange County Line in Los Angeles County, west of the present alignment of Fullerton Road (see Plate 19, Photo Appendix).

Districts' Conclusion

The Fullerton Road site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Fullerton Road site (Site 1, Table 3 of this document) was determined to have critical deficiencies that included site preparation, site restorability and ecological values (S6, C1 and C2). These deficiencies are described on page V-10 of the Draft Puente Hills Landfill EIR in the following manner:

Fullerton Road Site. This entire site is an active oil field. The value of the site as an oil production facility substantially outweighs the alternate use as a sanitary landfill at the present time. In addition to the critical deficiency due to the use displaced, the site also received a critical deficiency for site preparation, due to the considerable time and cost that would be required for removal of pipes, well casings and other subterranean facilities related to oil recovery. A portion of this site also is contained within a designated "Significant Ecological Area".[4]

In the 1987 Study the Districts identified all five urban deficiency codes (U1, U2, U3, U4 and U5) based on the change in level of development in the surrounding area in the intervening period.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Fullerton Road site (Plate 19, Photo Appendix) indicates that this area remains undisturbed because of its continued use for oil production purposes. The productivity of this area continues to make it too expensive to acquire (S1) and too expensive to prepare for landfilling (S6) due to the presence of underground wells and pipelines. The ecological values referenced in the County's General Plan appear to remain undiminished due to the lack of development within the canyon (C2) and it would not be possible to restore these values after a landfill was completed (C1). Based on the these deficiencies, the Fullerton Road site was judged a critically deficient site and unsuitable for a regional landfill.

In the interim since the Puente Hills Landfill EIR was certified, the area has incurred substantial urbanization. Access to the Fullerton Road site would require travel over more than five miles of local roads through residential areas from either the 60 or 57 Freeways. Based on the current access situation through these

residential area, access and other urban conflicts (U1, U2, U3 and U5) also constitute critical deficiencies for this location. It was eliminated as a suitable location for a regional landfill.

74. SITE NAME: RINCON DE LA BREA (CANYON 549)

USGS QUADRANGLE: YORBA LINDA

DESCRIPTION: URBAN AREA AND CONSERVATION AREA IN THE PUENTE HILLS

LOCATION: SEE PLATE 20 IN THE PHOTO APPENDIX AND PAGE 97 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Rincon de la Brea canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located on the north slope of the Puente Hills adjacent to the City of Walnut.

Districts' Conclusion

The Rincon de la Brea canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Rincon de la Brea canyon site (Site 2, Table 3 of this document) was determined to have critical deficiencies that included ecology and restorability constraints and urban conflicts (U1, U2, U3, C1 and C2). These deficiencies are described on page V-10 of the Draft Puente Hills Landfill EIR in the following manner:

Rincon De La Brea. All of this site which is located west of the 57 Freeway just south of Brea Canyon Road is designated a "Significant Ecological Area" (SEA) in the Los Angeles County General Plan (November, 1980).[4] *This site received critical deficiencies for both the ecology and restorability criteria due to the significance of the native habitat and its uniqueness as an undisturbed area.*

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Rancho de la Brea canyon site (Plate 20, Photo Appendix) indicates that this area has not been preserved, and that substantial residential encroachment has occurred since 1983. Therefore, residential development over the past nine years has eliminated ecological values, but has created new deficiencies. Access to the site would be from either the 60 or 57 Freeways through urban residential neighborhoods. Several thousand refuse trucks delivering waste would pass through this neighborhood. The effect of access through a residential area on local streets increases the deficiency of the site (U4). In addition the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers. Based on similar evaluations for other locations, it would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts at this location and these impacts would be unacceptably high at this site (U1, U2, and U3). It was eliminated as a suitable location for a regional landfill.

75. **SITE NAME:** TONNER CANYON (CANYON 574)

USGS QUADRANGLE: YORBA LINDA

DESCRIPTION: URBAN AREA AND CONSERVATION AREA IN THE CHINO HILLS

LOCATION: SEE PLATE 21 IN THE PHOTO APPENDIX AND PAGE 97 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Tonner Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located on the southwestern slope of the Puente Hills adjacent to the City of Diamond Bar.

Districts' Conclusion

The Tonner Canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Tonner Canyon site (Site 3, Table 3 of this document) was determined to have critical deficiencies that included ecology, restorability, and urban conflicts (U1, U2, U3, U4, C1 and C2). These deficiencies are described in Appendix V-B of the Draft Puente Hills Landfill EIR in the following manner:

Tonner Canyon - This site, presently used by the Boy Scouts of America as a campground and recreational area is also designated as a Significant Ecological Area, Therefore, if utilized as a landfill would not be restorable to its present unique condition as an undisturbed native habitat.*

* County of Los Angeles General Plan, Special Management Area Map.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Tonner Canyon site (Plate 21, Photo Appendix) indicates that this area and its ecological values has been preserved, but that substantial residential encroachment has occurred since 1983 along the northwestern rim of the canyon, the southwestern rim and south of the canyon. Therefore, in addition to the conservation critical deficiency assigned to this site based on its SEA designation (C1 and C2), residential development over the past nine years has created additional deficiencies.

Access to the site would be from the 57 Freeway via Brea Canyon Boulevard and Tonner Canyon Road. Several thousand refuse trucks delivering waste would pass through this neighborhood if the Tonner Canyon site was used for a landfill. The effect of access through a residential area on local streets increases the deficiency of the site (U4). In addition the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers (U1, U2 and U3). It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill.

76. SITE NAME: **TRES HERMANOS CANYON**

USGS QUADRANGLE: **YORBA LINDA**

DESCRIPTION: **URBAN AREA AND CONSERVATION AREA IN THE EASTERN-MOST PUENTE HILLS**

LOCATION: **SEE PLATE 21 IN THE PHOTO APPENDIX AND PAGE 97 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Tres Hermanos Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located on the southwestern slope of the Puente Hills in the City of Diamond Bar.

Districts' Conclusion

The Tres Hermanos Canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Tres Hermanos Canyon site (Site 4, Table 3 of this document) was determined to have urban critical deficiencies (U1, U2, U3, U4 and U5). These deficiencies are described in Appendix V-B of the Draft Puente Hills Landfill EIR in the following manner:

Tres Hermanos Canyon - This site owned and scheduled for development by the Urban Development Agency, City of Industry.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Tres Hermanos Canyon site (Plate 20, Photo Appendix) indicates that this area has been developed for industrial uses, and substantial residential encroachment has occurred since 1983 along the south and southeastern rim of the canyon and west of the site . The photograph verifies the critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site and the residential development over the past nine years further decreases the suitability of this location.

Access to the site would be along Brea Canyon Road from the 57 Freeway. Several thousand refuse trucks delivering waste would pass through this neighborhood if the Tres Hermanos Canyon site was used for a regional landfill. The effect of access through a residential area on local streets increases the deficiency of the site. In addition the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill.

77. **SITE NAME:** PHILLIPS RANCH (CANYON 546)

USGS QUADRANGLE: SAN DIMAS

DESCRIPTION: URBAN AREA AND CONSERVATION AREA IN THE EASTERN-MOST CHINO HILLS

LOCATION: SEE PLATE 22 IN THE PHOTO APPENDIX AND PAGES 94 AND 97A 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Canyon 546 was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located on the northeastern slope of the Chino Hills in the City of Diamond Bar.

Districts' Conclusion

The Canyon 546 site was eliminated from further consideration by the Districts during the initial screening process. The Canyon 546 site (Site 5, Table 3 of this evaluation) was determined to have major urban critical deficiencies. These deficiencies are related to urban development which completely encompasses the canyon and which prevent isolation of a landfill and mitigation of impacts (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Canyon 546 site (Plate 22, Photo Appendix) indicates that this area has been fully developed as residential uses, and substantial additioual residential encroachment has occurred since 1983 along the south and western edges of this site. The photograph verifies the critical deficiencies assigned to this site (U1, U2, U3, U4 and U5). The impacts related to access through a residential area on local streets increase the deficiency of the site. In addition, the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill.

78.	**SITE NAME:**	**DIAMOND BAR (CANYON 545)**
	USGS QUADRANGLE:	**SAN DIMAS**
	DESCRIPTION:	**URBAN AREA AND CONSERVATION AREA IN THE NORTHWEST PUENTE HILLS**
	LOCATION:	**SEE PLATE 20 IN THE PHOTO APPENDIX AND PAGE 97 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Canyon 545 was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located on the northwest slope of the Puente Hills in the City of Diamond Bar near the Highway 60 and 57 interchange.

Districts' Conclusion

The Canyon 545 site was eliminated from further consideration by the Districts during the initial screening process. The Canyon 545 site (Site 6, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to urban development which completely encompasses the canyon, including the Diamond Bar Golf Course north of the site (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Canyon 545 site (Plate 20, Photo Appendix) indicates that this area has been fully developed as residential, industrial, and commercial uses, and substantial additional residential encroachment has occurred since 1983 along the south and eastern edges of this site. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. The impacts related to access through a residential area on local streets increase the deficiency of the site. In addition, the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Canyon 545. It was eliminated as a suitable location for a regional landfill.

79.	SITE NAME:	SAN DIMAS (CANYON 502)
	USGS QUADRANGLE:	SAN DIMAS
	DESCRIPTION:	URBAN AREA IN THE SAN JOSE HILLS NEAR PUDDINGSTONE RESERVOIR
	LOCATION:	SEE PLATE 23 IN THE PHOTO APPENDIX AND PAGES 89 AND 93 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Canyon 502 was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Jose Hills just northwest of the Interstate 10 and Interstate 215 Interchange in the City of San Dimas.

Districts' Conclusion

The Canyon 502 site was eliminated from further consideration by the Districts during the initial screening process. The Canyon 502 site (Site 7, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to urban, primarily residential, development which completely encompasses the canyon (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Canyon 502 site (Plate 23, Photo Appendix) indicates that this area has been fully developed as residential subdivisions and substantial additional residential encroachment has occurred since 1983 along the southern and eastern edges of this site. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. The impacts related to access through a residential area on local streets increase the deficiency of the site. In addition, the slopes of the canyon are now surrounded by residences which eliminate the potential to establish effective buffers. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Canyon 502. It was eliminated as a suitable location for a regional landfill.

80.	**SITE NAME:**	**SAN JOSE HILLS (CANYON 508)**
	USGS QUADRANGLE:	**SAN DIMAS**
	DESCRIPTION:	**URBAN AREA IN THE SAN JOSE HILLS SOUTH OF FOREST LAWN-COVINA HILLS**
	LOCATION:	**SEE PLATE 24 IN THE PHOTO APPENDIX AND PAGE 93 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Canyon 508 was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Jose Hills just south of Forest Lawn-Covina Hills in the City of Walnut.

Districts' Conclusion

The Canyon 508 site was eliminated from further consideration by the Districts during the initial screening process. The Canyon 508 site (Site 8, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to urban, primarily residential, development which occurs on the site and to the west and east of the canyon and the presence of Mount San Antonio College located directly south of the site (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Canyon 508 site (Plate 24, Photo Appendix) indicates that this area is being fully developed as residential subdivisions and substantial additional residential encroachment has occurred since 1983 along the western and eastern edges of this site. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. The impacts related to access through a residential and college area on local streets increase the deficiency of the site. Canyon 508 slopes to the south where the surrounding residences and the college exist which eliminates the potential to establish effective buffers. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Canyon 508. It was eliminated as a suitable location for a regional landfill.

81. **SITE NAME:** MORGAN CANYON (CANYON 453a)

USGS QUADRANGLE: GLENDORA

DESCRIPTION: SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF GLENDORA

LOCATION: SEE PLATE 25 IN THE PHOTO APPENDIX AND PAGE 87 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Morgan Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, north of the City of Glendora and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Morgan Canyon site was eliminated from further consideration by the Districts during the initial screening process. The Morgan Canyon site (Site 9, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to access to Morgan Canyon from the Foothill Freeway which requires approximately 1.5 miles of travel on local residential roads (Lone Hill Avenue) and the residential development that borders Morgan Canyon to the south (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Morgan Canyon site (Plate 25, Photo Appendix) indicates that the area to be traversed to access a regional landfill at this location (about 1.5 miles of local roads) is fully developed as residential subdivisions and new development is encroaching into the mouth of the Canyon itself. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. Morgan Canyon slopes to the south where the surrounding residences exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Morgan Canyon. It was eliminated as a suitable location for a regional landfill.

82. **SITE NAME:** **HARROW CANYON (CANYON 453b)**

USGS QUADRANGLE: **GLENDORA**

DESCRIPTION: **SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF GLENDORA**

LOCATION: **SEE PLATE 25 IN THE PHOTO APPENDIX AND PAGE 87 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Harrow Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, north of the City of Glendora and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Harrow Canyon site was eliminated from further consideration by the Districts during the initial screening process. Harrow Canyon (Site 10, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to access to Harrow Canyon from the Foothill Freeway which requires approximately 2.5 miles of travel on local residential roads (Glendora and Live Oak Avenues), the flood management facilities (debris basin) in the canyon, and residential development that occupies the entrance to Harrow Canyon at the mouth of the canyon (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Harrow Canyon site (Plate 25, Photo Appendix) indicates that the area to be traversed is fully developed as residential subdivisions and new development is encroaching into the mouth of the canyon itself. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. Harrow Canyon slopes to the south where the surrounding residences exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Harrow Canyon. It was eliminated as a suitable location for a regional landfill.

83. SITE NAME: ENGLEWILD CANYON (CANYON 453c)

USGS QUADRANGLE: GLENDORA

DESCRIPTION: SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF GLENDORA

LOCATION: SEE PLATE 25 IN THE PHOTO APPENDIX AND PAGE 87 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Englewild Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, north of the City of Glendora and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Englewild Canyon site was eliminated from further consideration by the Districts during the initial screening process. Englewild Canyon (Site 11, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to access to Englewild Canyon from the Foothill Freeway which requires approximately 2.5 miles of travel on local residential roads (Glendora Avenue, Foothill Boulevard and Loraine Avenue), the flood management facilities (debris basin) in the canyon, and residential development that occupies the entrance to Englewild Canyon at the mouth of the canyon (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Englewild Canyon site (Plate 25, Photo Appendix) indicates that the area to be traversed is fully developed as residential subdivisions and several schools, and new development is encroaching into the mouth of the canyon itself. The photograph verifies the urban critical deficiencies (U, U2, U3, U4 and U5) assigned to this site. Englewild Canyon slopes to the south where the surrounding residences exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this small canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Englewild Canyon. It was eliminated as a suitable location for a regional landfill.

84. SITE NAME: **SYCAMORE CANYON**

USGS QUADRANGLE: **GLENDORA**

DESCRIPTION: **SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF GLENDORA**

LOCATION: **SEE PLATE 26 IN THE PHOTO APPENDIX AND PAGE 95A 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Sycamore Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills in the City of San Dimas and south of the Angeles National Forest boundary.

Districts' Conclusion

The Sycamore Canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Sycamore Canyon site (Site 12, Table 3 of this document) was determined to have critical deficiencies that included ecology and restorability (C1 and C2) and urban conflicts (U1, U2 and U3). These deficiencies are described in Appendix V-B of the Draft Puente Hills Landfill EIR in the following manner:

Sycamore Canyon. The majority of this site is considered a "Significant Ecological Area" in both the County General Plan and the Hacienda Heights Community Plan. The canyon and adjacent ridges possess "one of the finest undisturbed examples of natural vegetation remaining in the Puente Hills".[4] Like the Rincon De La Brea site, Sycamore Canyon received critical deficiencies for both ecology and restorability.

Updated Review and Conclusion

A review of the aerial photograph which includes Sycamore Canyon site (Plate 26, Photo Appendix) indicates that the upper portion of the canyon area has been preserved in its natural state and has been designated as San Dimas Canyon Park (C1, C2 and C3). The canyon is overlooked on the east by a County Juvenile Camp and a major park facility is located at the mouth of the canyon. Homes line the short route to the site from the Foothill Freeway and have been extended into the mountains on a ridge to the east of the canyon. The photograph verifies the critical deficiencies (U1, U2, and U3) assigned to this site and the current access (U4) and uses of the site are not compatible with the use of this canyon as a landfill site. It would not be possible in this small canyon to mitigate the adverse impacts to uses in the canyon and these impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill.

85.	SITE NAME:	HAM CANYON (CANYON 454)
	USGS QUADRANGLE:	GLENDORA
	DESCRIPTION:	SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF GLENDORA
	LOCATION:	SEE PLATE 26 IN THE PHOTO APPENDIX AND PAGE 95A 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Ham Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, in the northeast portion of the City of San Dimas and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Ham Canyon site was eliminated from further consideration by the Districts during the initial screening process. Ham Canyon (Site 13, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to access to Ham Canyon from the Foothill Freeway which requires approximately 1.5 miles of travel on local residential roads (San Dimas Canyon Road), the presence of the San Dimas Canyon Golf Course at the mouth of the canyon, and residential development that occupies the entrance and lower western ridge of Ham Canyon (U1, U2, U3 and U5).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Ham Canyon site (Plate 26, Photo Appendix) indicates that the area to be traversed is fully developed as residential subdivisions and the golf course, and new development is encroaching into the mouth of the canyon and the western ridge of the canyon (U1, U2, U3, U4 and U5). A further concern is the occurrence of San Dimas Creek, a major riparian corridor and major ground water recharge area, within 1/2 mile of the canyon (C2). The photograph verifies the critical deficiencies assigned by the Districts to this site and identifies additional deficiencies. Ham Canyon slopes to the southeast where the surrounding residences and recreational uses exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Ham Canyon. It was eliminated as a suitable location for a regional landfill

86. SITE NAME:	**BEATTY CANYON (CANYON 452)**
USGS QUADRANGLE:	**AZUSA**
DESCRIPTION:	**SAN GABRIEL FOOTHILLS NORTH AND EAST OF THE CITY OF AZUSA**
LOCATION:	**SEE PLATE 27 IN THE PHOTO APPENDIX AND PAGE 86 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Beatty Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, in the County northeast of the City of Azusa and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Beatty Canyon site was eliminated from further consideration by the Districts during the initial screening process. Beatty Canyon (Site 14, Table 3 of this document) was determined to have major urban critical deficiencies. These deficiencies are related to access to Beatty Canyon from the Foothill Freeway which requires approximately 2 miles of travel on local roads (Azusa/San Gabriel Avenues and Sierra Madre Avenue) and conflicting urban uses (U1, U2, U3, U4 and U5).

Updated Review and Conclusion

A review of the aerial photograph which includes the Beatty Canyon site (Plate 27, Photo Appendix) indicates that the area to be traversed is fully developed as commercial and residential subdivisions. In addition, the Hillside Campus of Azusa Pacific College is located just east of the canyon, the Manresa Retreat is located at the mouth of the canyon, and residential development occupies the entrance and lower ridges of the base of Beatty Canyon. These uses encroach into the mouth of Beatty Canyon and the western ridge of the canyon itself. The photograph verifies the urban critical deficiencies (U1, U2, U3, U4 and U5) assigned by the Districts to this site. Beatty Canyon slopes to the south where the surrounding residential, educational, and retreat uses exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Beatty Canyon. It was eliminated as a suitable location for a regional landfill.

87. **SITE NAME:** **EATON CANYON**

USGS QUADRANGLE: **MT. WILSON**

DESCRIPTION: **SAN GABRIEL FOOTHILLS NORTH OF THE CITY OF PASADENA**

LOCATION: **SEE PLATE 28 IN THE PHOTO APPENDIX AND PAGE 20 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Eaton Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills north of the Cities of Pasadena and Altedena and part inside and outside of the Angeles National Forest boundary.

Districts' Conclusion

The Eaton Canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Eaton Canyon site (Site 15, Table 3 of this document) was determined to have three major deficiencies (U1, U3 and U4). These deficiencies are described in Appendix V-B of the Draft Puente Hills Landfill EIR in the following manner:

Eaton Canyon - Like Clamshell Canyon, access to this site would be through narrow residential streets.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes Eaton Canyon site (Plate 28, Photo Appendix) indicates that to reach the canyon from the Foothill Freeway, several thousand refuse trucks delivering waste would have to travel more than three miles on Lake and Allen Avenues to the Canyon mouth and there is no current access into the canyon. Homes line the route to the site from the Foothill Freeway and have been extended right up to the mouth of Eaton Canyon where it exits the foothills (U1, U2, and U3). The photograph verifies the critical deficiency assigned to the access route to this site (U4). Immediately downstream of the proposed landfill site are recharge facilities that could be contaminated due to operations of a landfill in this canyon (C2). It would not be possible to mitigate the adverse impacts to the residential and urban uses adjacent to the access roads These impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill.

88. SITE NAME: **CLAMSHELL CANYON**

USGS QUADRANGLE: **MT. WILSON**

DESCRIPTION: **SAN GABRIEL FOOTHILLS IN THE NORTHERN PORTION OF MONROVIA**

LOCATION: **SEE PLATE 29 IN THE PHOTO APPENDIX AND PAGES 20A AND 20B 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Clamshell Canyon was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills in the northern portion of Monrovia, but Clamshell Canyon opens to the west into the City of Arcadia and Santa Anita Wash. This canyon lies south of the Angeles National Forest boundary.

Districts' Conclusions

The Clamshell Canyon site passed the initial screening process in the EIR and was eliminated from further consideration in the second screening process. The Clamshell Canyon site (Site 16, Table 3 of this Document) was determined to have urban critical deficiencies (U1, U3 and U4). These deficiencies are described in Appendix V-B of the Draft Puente Hills Landfill EIR in the following manner:

Clamshell Canyon - Access to this site would bring refuse collection vehicles through narrow residential streets. An access road of between one-half to one mile would be required from existing roads to the actual site. Additionally, access would need to be made crossing a flood control channel.

Updated Review and Conclusion

The flood control channel of concern is Santa Anita Wash. A review of the 1990 aerial photograph which includes Clamshell Canyon site (Plate 29, Photo Appendix) indicates that from the point where Clamshell Canyon exits the San Gabriel Mountains it would flow directly into Santa Anita Wash, a major water recharge area. The potential for damage to local ground water supplies is one critical deficiency (C2). To reach the canyon from the Foothill Freeway, refuse trucks would have to travel more than two miles on Santa Anita Road and local streets to the Canyon mouth and there is no access into the canyon itself (U4). Homes line the route to the site from the Foothill Freeway and have been extended right up to the mouth of Clamshell Canyon where it exits the foothills. The photograph verifies the urban critical deficiencies (U1,U3, U2, and U4) assigned to this site by the Districts. Several thousand refuse trucks delivering waste would pass through these local neighborhood streets if the Clamshell Canyon site was used for a regional landfill. These homes have direct visual access into the canyon, and landfilling activities and related impacts could not be mitigated. It would not be possible to mitigate the adverse impacts to the residential and urban uses adjacent to the access roads. These impacts would be unacceptably high at this site. It was eliminated as a suitable location for a regional landfill

89. **SITE NAME:** GAIL CANYON (CANYON 510)

USGS QUADRANGLE: MT. BALDY

DESCRIPTION: SAN GABRIEL FOOTHILLS NORTH THE CITY OF CLAREMONT

LOCATION: SEE PLATE 30 IN THE PHOTO APPENDIX AND PAGE 96 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Gail Canyon (Canyon 510) was initially evaluated as an alternative site in the Spadra Landfill Environmental Impact Report (EIR) certified in 1985. This canyon is located in the San Gabriel Mountain foothills, in the County northeast of the City of Claremont and just south of the Angeles National Forest boundary.

Districts' Conclusion

Canyon 510 was identified as one of the alternative sites for comparison with the Spadra Landfill Project. The Districts' staff and Advisory Committee reviewers included it without any explanations in the EIR. In the rating process (see Tables 8 and 9 in this document), Canyon 510 tied for the fourth best rating of the nine sites given a comparative evaluation.

In the 1987 Districts' review of alternative locations, Canyon 510 was disqualified from further consideration based on urban deficiencies (U1, U2, U3 and U4). Although ranked and considered in the Spadra EIR, the Canyon 510 site was subsequently eliminated from further consideration as part of the additional screening conducted in 1987 as part of the site evaluation process conducted for the "Action Plan". In the latter evaluation Canyon 510 was determined to have major urban critical deficiencies, as noted above, which were not elaborated.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Canyon 510 site (Plate 30, Photo Appendix) indicates that the urban critical deficiencies assigned by the Districts are related to aceess to Canyon 512 from the San Bernardino Freeway which requires approximately 2.5 miles of travel on local urban roads (Indian Hill Boulevard, Mills Avenue and Mt. Baldy Road), and the presence of homes at the mouth of the canyon and on the western ridge. The area to be traversed is fully developed as commercial and residential subdivisions and the Claremont colleges and Rancho Santa Botanical Gardens are located along the route. New development is encroaching on the western ridge of the canyon. The photograph verifies these urban critical deficiencies (U1, U2, U3 and U4) assigned to this site. Canyon 510 slopes to the southeast where the surrounding residential uses exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Canyon 512. The canyon also is located directly adjacent to the San Antonio Creek percolation basins where potential damage to ground water resources would be particularly high (C2). It was eliminated as a suitable location for a regional landfill.

90. SITE NAME: **BURBANK CANYON (CANYON 512)**

USGS QUADRANGLE: **MT. BALDY**

DESCRIPTION: **SAN GABRIEL FOOTHILLS NORTH THE CITY OF CLAREMONT**

LOCATION: **SEE PLATE 30 IN THE PHOTO APPENDIX AND PAGE 96 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Burbank Canyon (Canyon 512) was initially evaluated as an alternative site in the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This canyon is located in the San Gabriel Mountain foothills, in the County northeast of the City of Claremont and just south of the Angeles National Forest boundary.

Districts' Conclusion

Canyon 512 was identified as one of the alternative sites for comparison with the Spadra Landfill Project. The Districts' staff and Advisory Committee reviewers included it without any explanations in the EIR. In the rating process (see Tables 8 and 9 in this document), Canyon 512 tied for the fourth best rating of the nine sites given a comparative evaluation.

In the 1987 Districts' review of alternative locations, Canyon 512 was disqualified from further consideration based on urban deficiencies (U1, U2, U3, U4 and U5). Although ranked and considered in the Spadra EIR, the Canyon 512 site was subsequently eliminated from further consideration as part of the additional screening conducted in 1987 as part of the site evaluation process conducted for the "Action Plan". In the latter evaluation Canyon 512 was determined to have major urban critical deficiencies, as noted above, which were not elaborated.

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Canyon 512 site (Plate 30, Photo Appendix) indicates that these urban critical deficiencies assigned by the Districts are related to access to Canyon 512 from the San Bernardino Freeway which requires approximately 2.5 miles of travel on local urban roads (Indian Hill Boulevard, Mills Avenue and Mt. Baldy Road), and the presence of homes at the mouth of the canyon and on the western ridge. The area to be traversed is fully developed as commercial and residential subdivisions and the Claremont colleges and Rancho Santa Botanical Gardens are located along the route. New development is encroaching on the western ridge of the canyon. The photograph verifies these urban critical deficiencies (U1, U2, U3, U4 and U5) assigned to this site. Canyon 512 slopes to the southeast where the surrounding residential uses exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Canyon 512. The canyon also is located directly adjacent to the San Antonio Creek percolation basins where potential damage to ground water resources would be particularly high (C2). It was eliminated as a suitable location for a regional landfill.

91. SITE NAME: CHICKEN CANYON

USGS QUADRANGLE: MT. BALDY

DESCRIPTION: SAN GABRIEL FOOTHILLS NORTH THE CITY OF CLAREMONT

LOCATION: SEE PLATE 30 IN THE PHOTO APPENDIX AND PAGE 96 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Chicken Canyon was initially evaluated as an alternative site by the Sanitation District as part of an independent review following the Spadra EIR. This canyon is located in the San Gabriel Mountain foothills, in the County northeast of the City of Claremont and just south of the Angeles National Forest boundary.

Districts' Conclusion

The Chicken Canyon site was eliminated from further consideration by the Districts during the initial screening process. Chicken Canyon was determined to have major urban critical deficiencies. These deficiencies are related to access to Chicken Canyon from the San Bernardino Freeway which requires approximately 2.5 miles of travel on local urban roads (Indian Hill Boulevard, Mills Avenue and Mt. Baldy Road), and the presence of the Padua Hills Theater adjacent to the site (U1 and U4).

Updated Review and Conclusion

A review of the 1990 aerial photograph which includes the Chicken Canyon site (Plate 30, Photo Appendix) indicates that urban critical deficiencies are related to access to Chicken Canyon from the San Bernardino Freeway which requires approximately 2.5 miles of travel on local urban roads (Indian Hill Boulevard, Mills Avenue and Mt. Baldy Road), and the presence of Padua Hills Theater at the mouth of the canyon. The area to be traversed is fully developed as commercial and residential subdivisions and the Claremont colleges and Rancho Santa Botanical Gardens are located along the route. New development is encroaching on the western ridge of the canyon. The photograph verifies these urban critical deficiencies (U1, U2, U3 and U4). Chicken Canyon slopes to the southeast where the surrounding residential uses exist which eliminates the potential to establish effective buffers between uses. It would not be possible in this canyon to mitigate the adverse impacts of odor, methane gas, noise, dust, vectors and visual impacts. These impacts would be unacceptably high at Chicken Canyon. The canyon also is located directly adjacent to the San Antonio Creek percolation basins where potential damage to ground water resources would be particularly high (C2). It was eliminated as a suitable location for a regional landfill.

92.	SITE NAME:	BLIND CANYON
	USGS QUADRANGLE:	OAT MOUNTAIN/SANTA SUSANA
	DEFICIENCIES:	NO CRITICAL DEFICIENCY. REMAINS TO BE EVALUATED AS A POTENTIAL LANDFILL SITE
	DESCRIPTION:	NORTHWEST OF THE INTERSECTION OF TOPANGA BOULEVARD AND THE SIMI VALLEY FREEWAY
	LOCATION:	SEE PLATE 31 IN THE PHOTO APPENDIX AND PAGE 1A 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Blind Canyon site has been identified by a private proponent as a possible regional landfill site and has been carried through the review process into the Districts' 1990 Draft Program EIR. It is located north of Highway 118 (Simi Valley-San Fernando Valley Freeway), just north of the Topanga Canyon Boulevard (State Highway 27)-Highway 118 interchange.

Districts' Conclusion

According to the Districts' 1990 Draft Program EIR, the Blind Canyon site was identified as a suitable alternative regional landfill site.

Update Review and Conclusion

Blind Canyon (Plate 31, Photo Appendix) remains an alternative landfill site without any identified critical deficiencies at this time. This site has potential problems associated with the Santa Monica Mountains Conservancy which has acquired land from within the area that may make acquisition very difficult, if not impossible. Upon reconsideration of all the current factors, Blind Canyon may be given an S1 (Acquirability) critical deficiency and removed from consideration in the future. This has not yet occurred

93. **SITE NAME:** **BROWNS CANYON**

USGS QUADRANGLE: **OAT MOUNTAIN**

DESCRIPTION: **NORTHEAST OF THE INTERSECTION OF TOPANGA BOULEVARD AND THE SIMI VALLEY FREEWAY**

LOCATION: **SEE PLATE 31 IN THE PHOTO APPENDIX AND PAGE 1A 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Browns Canyon site was originally identified as a possible alternative landfill location in the 1975 County Solid Waste Master Plan (CoSWMP). It was considered in the Districts' 1990 Draft Program EIR. The site is located north and east of Blind Canyon, north of San Fernando Valley and the State Highways 27 and 118 interchange.

Districts' Conclusion

Based on data in the Districts' 1990 PEIR, Browns Canyon (Plate 31, Photo Appendix) has been eliminated from further consideration based on severe geotechnical hazards identified during recent research. Essentially, the potential for active (Holocene) faulting through the canyon made continued consideration of this location infeasible because it conflicts with siting criteria contained in Chapter 15 of the California Administrative Code which requires that new Class III landfills not be located on a known Holocene Fault.

Update Review and Conclusion

Based on the available data, Browns Canyon has a critical deficiency (S3) which removes it from further consideration as an alternative landfill site.

94.	**SITE NAME:**	**ELSMERE CANYON**
	USGS QUADRANGLE:	**OAT MOUNTAIN/SAN FERNANDO**
	DESCRIPTION:	**INTERSECTION OF GOLDEN STATE FREEWAY AND SAN FERNANDO ROAD**
	LOCATION:	**SEE PLATE 32 IN THE PHOTO APPENDIX AND PAGE 127 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Elsmere Canyon site was initially identified by a private proponent and was addressed in the 1980 CoSWMP as a potential landfill site. This site is located on private and public land (Angeles National Forest) north and east of the Interstate 215-Interstate 5 interchange.

Districts' Conclusion

The Elsmere Canyon site remains a viable alternative landfill location but has not been evaluated within any County documents.

Updated Review and Conclusion

Elsmere Canyon (Plate 32, Photo Appendix) has no identified critical deficiencies to date and is being evaluated as a proposed regional landfill site in the EIR/EIS being prepared for Los Angeles County and the U. S. Forest Service.

95. **SITE NAME:** **FISH CANYON**

USGS QUADRANGLE: **AZUSA**

DESCRIPTION: **SAN GABRIEL FOOTHILLS NORTH AND EAST OF THE CITY OF AZUSA**

LOCATION: **SEE PLATE 27 IN THE PHOTO APPENDIX AND PAGE 86 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Fish Canyon site was initially evaluated as an alternative to the Puente Hills Landfill in the 1983 EIR. It is located north of the San Gabriel River with its mouth located in the City of Azusa about two miles north of the Foothill Freeway.

Districts' Conclusion

The District identified Fish Canyon as an alternative landfill site up to the evaluation in the 1990 Draft Program EIR. In the 1990 EIR Fish Canyon was eliminated from further consideration based on a series of critical deficiencies. Fish Canyon is located on the front of the San Gabriel Mountains with a fairly large drainage basin (3,200 acres). Based on flood hazards associated with storm runoff and debris accumulation (a debris basin is located at the mouth of the canyon), this site was found to be clearly environmentally inferior to the proposed sites (C1 and C2).

Updated Review and Conclusion

This site was reviewed in the 1990 aerial photograph (Plate 27, Photo Appendix) and the Districts' conclusions were verified. Furthermore, a gun club is located at the mouth of the canyon which provides local recreational benefits (C3). Additional issues of concern include access through residential areas (U4) and a perennial stream in the canyon which supports a highly developed riparian habitat. Fish Canyon flows directly into the San Gabriel River, a major recharge basins located at the mouth of the canyon. Water quality degradation is also a major concern. Based on the significance of potential impacts from utilizing Fish Canyon as a landfill, it has been eliminated as an alternative landfill location.

96. SITE NAME: **LA TUNA CANYON**

USGS QUADRANGLE: **BURBANK**

DESCRIPTION: **VERDUGO MOUNTAINS BETWEEN SUN VALLEY AND LA CAÑADA**

LOCATION: **SEE PLATE 33 IN THE PHOTO APPENDIX AND PAGE 10 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

La Tuna Canyon was originally identified as an alternative landfill site in the 1975 CoSWMP. This site is located in the Verdugo Hills, south of La Tuna Canyon Road and east of Verdugo Mountain Park.

Districts' Conclusion

The Districts have considered La Tuna Canyon a possible alternative landfill site and had not identified any critical deficiencies until the 1990 Draft Program EIR was published. In that document La Tuna Canyon was eliminated from further consideration based on a series of critical deficiencies. This canyon is accessed through commercial and residential areas which is a critical deficiency (U4). The Los Angeles City Council has declared that La Tuna Canyon is to be preserved as open space (C4). This site contains less than three years of landfill capacity (S5) and therefore it cannot satisfy the Action Plan long-term disposal capacity requirement.

Updated Review and Conclusion

A review of the 1990 aerial photograph (Plate 33, Photo Appendix) verifies the urban critical deficiencies identified by the District. Based on the significance of these critical deficiencies, La Tuna Canyon has been eliminated as an alternative landfill location.

97. **SITE NAME:** **MISSION/RUSTIC-SULLIVAN CANYONS**

USGS QUADRANGLE: **TOPANGA/BEVERLY HILLS**

DESCRIPTION: **AREA OF THE SANTA MONICA MOUNTAINS WEST OF THE 405 FREEWAY**

LOCATION: **SEE PLATE 4 IN THE PHOTO APPENDIX AND PAGES 30 AND 31 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Mission/Rustic-Sullivan Canyons site was originally identified as an alternative landfill site in the 1975 CoSWMP and in the 1980 Mission Canyon Landfill EIR. The canyons are located in the Santa Monica Mountains west of the 405 Freeway, the closed Mission Canyon Landfill and Mandeville Canyon.

Districts' Conclusion

The Districts have retained these canyons as possible landfill sites even though acknowledging significant problems with them, including urban incompatibilities and political concerns. These canyons are generally west of most development, but are immediately adjacent to Topanga State Park and the Santa Monica National Recreation Area. Most of Rustic Canyon is located within the park. The 1980 Mission Canyon Landfill characterized the Rustic Canyon issues as follows: *NOTE: Although Rustic Canyon has serious deficiencies, it was taken through the next stage of complete evaluation against all criteria. Its deficiencies are: 1) haul time would be nearly 2 hours because the Reseda-to-the-sea Freeway has been deleted from the State plans. 2) Access would only be practical through Caballero Canyon tributaries (access is not dependent on landfilling those tributaries, but, from the standpoint of economical operations, this would be preferable). 3) It is de facto wilderness and immediately adjacent to 4,500 acres in Topanga State Park recommended for wilderness designation by the Resources agency of the State of California. Accordingly, only a portion of Rustic is considered, viz., the east branch above its confluence with the west branch. This choice for consideration : 1) is closest to the eastern most Caballero tributary; 2) avoids the Shell Oil pipeline; 3) is peripheral to the wilderness; 4) avoids the areas most compatible with wilderness recreation, e.g., trail routes within the canyon; 5) offers a post-filling gently sloping area, with an access road immediately off Mulholland, 6) is very easily secluded and buffered from Mulholland.*

Updated Review and Conclusion

According to a Joint Powers Agreement established between the City of Los Angeles and Los Angeles County the Mission/Rustic-Sullivan Canyons landfill will not be developed if Elsmere can be permitted and brought into operation. Access to these canyons may be lost if the land is incorporated into the Santa Monica National Recreation Area. For the time being this alternative landfill site (Plate 4, Photo Appendix) remains viable and will be evaluated in the context of the above considerations.

98.	SITE NAME:	PEÑA CANYON
	USGS QUADRANGLE:	TOPANGA
	DESCRIPTION:	AREA OF THE SANTA MONICA MOUNTAINS WEST OF THE TOPANGA CANYON BOULEVARD
	LOCATION:	SEE PLATE 5 IN THE PHOTO APPENDIX AND PAGE 115 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

The Peña Canyon site was initially evaluated as an alternative site to the Mission Canyon Landfill as part of the Mission Canyon Landfill Environmental Impact Report (EIR) certified in 1980. This site is located west of Topanga Canyon Boulevard directly north of Pacific Coast Highway and the Pacific Ocean.

Districts' Conclusion

The Peña Canyon site had no original critical deficiencies and was evaluated as an alternative site in the Districts' 1990 PEIR. In the 1990 PEIR it was evaluated and found to have critical deficiencies. Peña Canyon would obtain its access from Pacific Coast Highway west of Topanga Canyon Boulevard. According to the 1990 PEIR, the more detailed evaluation of haul time (S2) and traffic impacts from using local winding roads (U4, Topanga Canyon Boulevard and/or Pacific Coast Highway) resulted in a conclusion that Peña Canyon is not a feasible regional disposal facility alternative.

Updated Review and Conclusion

The 1990 aerial photograph (Plate 5 Photo Appendix) was reviewed and the critical deficiencies assigned by the District in the 1990 PEIR were verified. Based on the potential haul time and access constraints and impacts, Peña Canyon was eliminated as a suitable location for a regional landfill.

99. SITE NAME:	**SIERRA MADRE CANYON (LITTLE SANTA ANITA CANYON)**
USGS QUADRANGLE:	**MT. WILSON**
DESCRIPTION:	**SAN GABRIEL MOUNTAIN FOOTHILLS NORTH OF SIERRA MADRE**
LOCATION:	**SEE PLATE 34 IN THE PHOTO APPENDIX AND PAGE 20A 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

The Sierra Madre Canyon site was initially evaluated as an alternative to the Puente Hills Landfill as part of the Puente Hills Landfill Environmental Impact Report (EIR) certified in 1983. This site is located on the south slope of the San Gabriel Mountains north of Sierra Madre.

Districts' Conclusion

Sierra Madre Canyon was identified as an alternative site and had no critical deficiencies noted in the Puente Hills EIR. However, in the 1990 Draft Program EIR, Sierra Madre Canyon was eliminated from further consideration based on a series of critical deficiencies identified subsequent to the 1983 Puente Hills EIR. Sierra Madre Canyon (Little Santa Anita Canyon) contains a large drainage area and an extensive riparian habitat within the designated Sierra Madre Historical Wilderness Area. The potential flooding and erosion hazards, impacts to water quality and riparian areas (C1, C2, and C4), and impacts of waste delivery through the City of Sierra Madre (U4, Baldwin Avenue) resulted in a conclusion that the site is clearly environmentally inferior to the other sites being considered as alternative regional landfill sites.

Updated Review and Conclusion

The 1990 aerial photograph (Plate 34, Photo Appendix) was reviewed and the critical deficiencies were verified U4, C1, C2 and C4). Sierra Madre Canyon is not a suitable location for a regional landfill.

100.	**SITE NAME:**	**TOWSLEY CANYON**
	USGS QUADRANGLE:	**OAT MOUNTAIN**
	DESCRIPTION:	**WEST OF THE GOLDEN STATE FREEWAY NEAR NEWHALL**
	LOCATION:	**SEE PLATE 35 IN THE PHOTO APPENDIX AND PAGE 127 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Location

Towsley Canyon site was initially proposed by the Districts as an alternative as part of the 1987 Action Plan. The site is located west of the City of Santa Clarita and Interstate 5 about three miles northwest of the Interstate 5-Highway 14 interchange.

Districts' Conclusion

The Towsley Canyon site was evaluated in the Districts' 1990 PEIR. No critical deficiencies were identified by the Districts during this evaluation.

Updated Review and Conclusion

A review of the 1990 aerial photograph (Plate 35, Photo Appendix) of the site does not reveal any overt critical deficiencies. Access would be directly into Towsley Canyon from Interstate 5 without flowing through residential areas. The Santa Monica Mountains Conservancy is actively attempting to acquire land within Towsley Canyon and prevent its use as a landfill. These activities will play a role in the future availability of this site. Therefore, this canyon is currently considered a viable alternative location for a regional landfill.

101.	**SITE NAME:**	**TOYON II**
	USGS QUADRANGLE:	**BURBANK**
	DESCRIPTION:	**SANTA MONICA MOUNTAINS NORTH SIDE OF GRIFFITH PARK**
	LOCATION:	**SEE PLATE 15 IN THE PHOTO APPENDIX AND PAGE 24 1989 LOS ANGELES COUNTY THOMAS GUIDE**

<u>Site Summary</u>

The Toyon II site was initially evaluated as part of the 1986 CoSWMP and has been considered an alternative landfill location since that time. The site is located on the north edge of Griffith Park, southwest of the Interstate 5-Ventura Freeway interchange.

<u>Districts' Conclusion</u>

The Toyon II site has been considered an alternate landfill location since the 1986 CoSWMP and it was considered in the Districts' 1990 PEIR. The Toyon II site was eliminated from further consideration based on a series of critical deficiencies. Although Toyon I was operated as a small landfill adjacent to this site, the site is within Griffith Park and would conflict with park and recreation activities (C3). Toyon II was also rejected from further consideration, partially because of suspected geotechnical hazards (S3, a major fault traverses the site's main canyon) and primarily because the potential disposal capacity (S5, 4.5 million tons, total) is extremely small for a regional landfill site. It does not provide a full year's disposal tonnage and cannot satisfy the Action Plan's long term disposal capacity requirements.

<u>Updated Review and Conclusion</u>

The 1990 aerial photograph (Plate 15, Photo Appendix) was reviewed and the critical deficiencies were verified. Toyon II is not a feasible alternative location for a regional landfill.

APPENDIX C

DEFICIENCIES OF ALTERNATE SITES

SITE	PARTIAL DEFICIENCIES	CRITICAL DEFICIENCIES	ADVANTAGES/COMMENTS
Baldwin Hills	(a) Traffic - primary access would be via Slauson and La Cienega adjacent to residential areas for approximately 1 mile. (b) Majority of site has been acquired by County of Los Angeles for regional park development.	(a) Acquirability - Because of continuing oil recovery, site would be unavailable until early 1990's. (b) Preparation - proper sealing of oil wells and removal of pipes would be exorbitant in cost. (c) Uses displaced - the producing oil field could not be displaced for landfilling.	(a) Portions of site relatively well buffered from residences. (b) May provide location for transfer station. (c) Site located near center of wasteshed.
Bundy Canyon	(a) Canyon is virtually untouched and is ecologically valuable. (b) Residences at mouth of canyon and on surrounding ridges. Expansion of Mountain-Gate development will place more residences on surrounding ridges. Because of steepness, mitigation of visual access would be more difficult than Mission Canyon.	None	(a) Access potentially provided via existing road into Canyon 8.
Brownfield Canyon	(a) Capacity only 4 million tons (b) Very steep and deep, making operations very difficult. (c) Although the site does have some dirt available for cover material, additional dirt would need to be imported in order to provide the proper dirt to refuse ratio. (d) Could be difficult to screen from Casiano Road area. Very limited room for scales and because of lack of space, access road construction would be difficult.	None	Access would be from Sepulveda Blvd. via Brownfield Underpass off San Diego Freeway. No residential streets involved. Site is located close to Canyon 8, reducing need for adjustment by refuse hauling industry.
Caballero Canyon (Tributary)	(a) Development plans in progress. (b) Could need berms if land to east is developed. (c) Access would be via Reseda Blvd. through 1 1/2 to 2 miles of residential	None	Proposed as buffer area for NRA, capacity is approximately 30 milliog tons with adequate cover soil.

SITE	PARTIAL DEFICIENCIES	CRITICAL DEFICIENCIES	ADVANTAGES/COMMENTS
Cahuenga Peak (N. slope)	(a) The site is outside the existing Mission Canyon wasteshed and this would entail considerable additional driving (with related impacts) to many customers. (b) Capacity of the site is less than 5 million tons.	The site is virtually devoid of cover material. This would require almost 100% import of daily and final cover material.	None
Canyon X	Site is located immediately adjacent to the Metropolitan Water Districts' Sepulveda Feeder facility. Canyon is extremely narrow and walls steep, causing operational constraints.	Insufficient capacity (9 months) to act as an alternative solution.	Relatively well buffered from residences. Access from Canyon 8 would be possible. Site located near Canyon 8 reducing need for adjustment by refuse hauling industry.
Chandler Pit	Site is currently being used as a Class III site with a total capacity of approximately 14 million tons and if site were reclassified as a Class II site, capacity would be approximately 7 million tons.	(a) Regional Water Quality Control Brd. has ruled that site geology is not suitable for reclassification from Class III to II. (b) Located in extreme southern portion of County necessitating extended haul time with resultant increase in fuel consumption, air pollution, and cost.	If geology were suitable, it would make an ideal substitute for the Palos Verdes Landfill, which will close in late 1980. This would divert approximately 800-1000 tons from the Mission Canyon wasteshed.
Corbin Canyon	(a) Site is privately owned and being considered for further development. (b) It is on the extreme northwest edge of the Mission Canyon wasteshed at a distance causing haul times to approach the "No Project" haul times.	(a) Site access would be from the Ventura Freeway south on Corbin Avenue through more than 2 miles of residential streets. (b) Development on surrounding canyon ridges is significant and is positioned in such a menner as to make mitigation of impacts by berm construction nearly infeasible.	The site has a capacity of approximately 20 million tons.
Curson Canyon	(a) The site is located near the Hollywood Freeway on the edge of the Mission Canyon wasteshed.	Access would require travel along 1 to 2 miles of residential streets and depending on route, road width and grade could cause problems for larger refuse trucks.	Located next to Runyan Canyon, which is a funded park acquisition.
Garapito Canyon	Mulholland Drive (off of Topanga Blvd.) would need to be paved an additional 2 miles to provide a suitable all-weather access road.	(a) Site is located on the northwest edge of wasteshed and because of distance and access problems, haul time would be about 2 hours. (b) Approximately 1 1/2 miles of travel on Topanga Blvd. and over 2 miles of travel on Mulholland would be required after exiting the Ventura Freeway, all of which are also busy residential streets.	None

SI[illegible]	PARTIAL DEFICIENCIES	CRITICAL DEFICIENCIES	ADVANTAGES/COMMENTS
Higgins Canyon	Nearby residential development	(a) Access from the San Diego Freeway via Mulholland or from the Ventura Freeway via either Beverly Glen or Coldwater Canyon would require traversing several miles of narrow and frequently steep residential streets. (b) The site is within an area of "funded acquisition" for a park.	None
Hogg Canyon	(a) The site is so steep that landfill operations would be difficult. (b) Although the site does have some dirt available for cover material, additional dirt would need to be imported in order to provide the proper dirt to refuse ratio.	Homes are built on the surrounding ridges and the slopes are so steep that berms, etc. for mitigation are impossible to build.	Site is located close to Canyon 8 reducing need for adjustment by refuse hauling industry.
Kelvin Canyon	Site is located on northwest edge of Mission Canyon wasteshed and would increase driving time, gas consumption, air pollution, etc.	Site would require approximately 1 mile of travel through residential areas.	None.
Kenter Canyon	Site is virtually untouched and ecologically significant.	(a) Feasible access exists through Bundy Canyon only. Lacking access, this site does not stand on its own as an alternative. (b) Home of *Lampropeltis zonata pulcha*, a variety of King Snake that has been designated "depleted and protected"; habitat for this snake is limited.	Site has relatively large capacity especially if filled in conjunction with Bundy Canyon.
La Questa Lado	Located in the City of Carson which has an ordinance that prohibits the opening of new sanitary landfills or the reopening of old ones. A waiver for repeal of the ordinance would be required.	(a) Even though the site would cover more than 150 acres, capacity would be limited to 4 million tons. b) The site is virtually devoid of cover material. This would require almost 100% import of daily and final cover material. (c) Site is well outside Mission Canyon wasteshed could not serve as a complete alternative in itself.	This site could, if other problems were resolved, serve as a short-term replacement for the Palos Verdes site. Palos Verdes will close at the end of 1980. In this manner, the site could partially reduce the quantity of waste to be disposed of in the Mission Canyon wasteshed by 800-1000 tons per day.
Mission Canyon	(a) Site is located adjacent to established and developing communities. Potential for mitigation of impacts is good. (b) Site located adjacent to heavily travelled cross mountain highway.	None	(a) Site near Canyon 8 reducing need for adjustment by refuse hauling industry. (b) Unlike many alternatives sites, grading has previously occurred in Mission Canyon. (c) Direct access without travel on

SITE	PARTIAL DEFICIENCIES	CRITICAL DEFICIENCIES	ADVANTAGES/COMMENTS
Naval Reserve	(a) The Navy has indicated that the site is not available for sanitary landfilling.	(a) The site would require extensive preparation to remove tanks and piplines, which underlie the site. (b) The site is outside the Mission Canyon wasteshed and use would require lengthy haul time with attendant increase in fuel, air pollution, traffic, etc., if the site were to serve as a full alternative to Mission Canyon.	The site could receive waste now being disposed of at Palos Verdes Landfill, thereby relieving waste disposal in the Mission Canyon wasteshed. The site could possibly become a location for a refuse transfer station.
North Benedict Canyon	The area around the site has been intensely developed and would require extensive mitigation measures.	(a) Site is a "funded acquisition" for a park. (b) Approximately 1 mile of narrow residential streets must be traversed after exiting the Ventura Freeway.	None.
Piedra Gorda Canyon	(a) Site is outside Mission Canyon wasteshed requiring longer trips, more gas use, etc. (b) Access road would be very steep causing trouble for refuse trucks. (c) Traffic would be increased on Santa Monica Freeway and along Pacific Coast Hwy. (7 miles). (d) Area is subject to slides which frequently close Pacific Coast Highway. (e) Strong sea breezes would make litter control very difficult. (f) In the coastal zone for planning.	Access to the site would have to be through Peña Canyon and the site has no independent access.	None.
Peña Canyon	(a) Refuse trucks would need to travel Santa Monica Freeway & approximately 7 miles of Pacific Coast Highway. (b) Access road would be very steep. (c) Possible widening of Pacific Coast Highway. (d) In coastal zone. (e) Potential acquisition by NRA. (f) Site is in natural state, and located next to La Tuna Canyon which had been designated a significant ecological area. (g) Additional distance from wasteshed would generate 6 million vehicle miles more than Mission Canyon. (h) Sea breezes would make litter control difficult.	None.	(a) Site capacity is 30 million tons (approximately 15 years). (b) Potential for shielding operation from residential areas is good.

SITE	PARTIAL DEFICIENCIES	CRITICAL DEFICIENCIES	ADVANTAGES/COMMENTS
Peña Canyon (continued)	(f) Slides are frequent along Pacific Coast Highway and could close operations for several days at a time.		
Runyan Canyon	(a) Site is located in an area that is heavily developed and would be difficult to mitigate impacts. (b) On the edge of the wasteshed and would require significant additional refuse hauling.	(a) Site is a "funded acquisition" for a park. (b) Access from Hollywood Freeway would require that refuse trucks traverse hilly, residential streets.	None.
Rustic Canyon	(a) The site is still pristine and adjacent to Topanga State Park which may soon be designated a wilderness area. (b) Extensive preparation would be required for access, etc. (c) Haul time would be lengthy if accessed from the San Fernando Valley. (d) Site regarded as significant open space in Santa Monica Mountains.	(a) Road network that would have to be traveled is such that approximately 2 hours would be needed per trip. (b) Mulholland would potentially need to be widened for truck traffic unless Reseda-to-the-Sea Freeway was developed. Long travel on Reseda Blvd. thru residential areas on Mulholland would be neccessary.	Site has very large capacity but lack of Reseda-to-the-Sea Freeway made the site difficult to utilize.
Santa Maria Canyon	Mulholland Drive (off of Topanga Blvd.) would need to be paved an additional 2 miles to provide a suitable all-weather access road.	(a) Site is located on the northwest edge of wasteshed and because of distance and access problems, haul time would be about 2 hours. (b) Approximately 1 1/2 miles of travel on Topanga Blvd. and over 2 miles of travel on Mulholland would be required after exiting the Ventura Freeway, all of which are busy residential streets.	None.
Sullivan Canyon	(a) As in the case of Rustic Canyon, the lack of Reseda-to-the-Sea Freeway seriously limits potential of this site. (b) Site regarded as significant open space in Santa Monica Mountains.	(a) The Canyon is owned by three groups. The Districts own the west slope, So. Calif. Gas Co., the bottom and Eastport Associates, the east slope. Shell Oil also has an easement that runs thru the site from northwest to southeast. Acquiring the rights to fill would be difficult and expensive. (b) Part of the Eastport property has been dedicated to the State as permanent open space. (c) Extensive preparation would be required to relocate the gas lines on the site. (d) The same conditions regarding access and haul time as apply to Rustic Canyon.	The site, in conjunction with Rustic Canyon, has tremendous capacity.

APPENDIX D

Second Screening - Consideration of Critical Deficiencies. The second step in the screening process involved a detailed evaluation of the sites passing the initial screening. An extensive set of criteria was used in the evaluation of each site. The criteria are divided into three categories: 1) Service - criteria having to do with the ability of the site to meet regional solid waste management objectives; 2) Urban Uses - criteria related to landfill impacts on local land use; and 3) Conservation - criteria related to preservation of the natural land and the conservation of resources. Table V-4 presents the full list of evaluation criteria with a short definition of each criterion.

Each of the sites passing the initial screening was evaluated against the 20 criteria to determine if a "critical deficiency" was present which would eliminate the site from further consideration. A critical deficiency in a site occurred when it was unable to satisfy one or more of the evaluation criteria and the deficiency could not be practically corrected.

1) Replacement Alternate Sites.

The five alternate sites which passed the initial screening as potential replacement sites for the Puente Hills Landfill were evaluated against the set of criteria in the second step of the screening process. Critical deficiencies were found in all five potential replacement sites. The Puente Hills Landfill was also evaluated against the same set of criteria and no critical deficiencies were detected. Table V-5 presents a summary of the critical deficiency evaluation for the potential replacement sites and Puente Hills. The evaluation for each site is discussed in more detail below.

Rincon De La Brea. All of this site which is located west of the 57 Freeway just south of Brea Canyon Road is designated a "Significant Ecological Area" (SEA) in the Los Angeles County General Plan (November, 1980).[4] This site received critical deficiencies for both the ecology and restorability criteria due to the significance of the native habitat and its uniqueness as an undisturbed area.

Fullerton Road Site. This entire site is an active oil field. The value of the site as an oil production facility substantially outweighs the alternate use as a sanitary landfill at the present time. In addition to the critical deficiency due to the use displaced, the site also received a critical deficiency for site preparation, due to the considerable time and cost that would be required for removal of pipes, well casings and other subterranean facilities related to oil recovery. A portion of this site also is contained within a designated "Significant Ecological Area".[4]

Rancho Palos Verdes. The only access to this site, which is located north of Palos Verdes Drive South and south of Hawthorne Blvd, would require refuse vehicles to travel on very steep and winding two-lane residential streets. Since it would not be possible to widen this access route, this site was eliminated due to its failure to meet the access and traffic critera. In addition, the site has limited capacity and insufficient cover soil available on site.

Sycamore Canyon. The majority of this site is considered a "Significant Ecological Area" in both the County General Plan and the Hacienda Heights Community Plan. The canyon and adjacent ridges possess "one of the finest undisturbed examples of natural vegetation remaining in the Puente Hills".[4] Like the Rincon De La Brea site, Sycamore Canyon received critical deficiencies for both ecology and restorability.

Baldwin Hills. This is an active oil field which has been scheduled to extend feasible production into the 1990's. The County Department of Park and Recreation has acquired significant portions of the site and a Master Plan for park development is to be implemented in the near future. Existing subterranean installations of pipes and well casings would require extensive site preparation costs. The site does not possess long term capacity due to insufficient cover material. This site received the greatest number of critical deficiences (four) in the following areas; preparation, acquirability, cover and capacity and use displaced.

Puente Hills. Because of its location and size, the Puente Hills Landfill is ideally suited to serve the long term refuse disposal needs and, thereby satisfies the Service criteria. With respect to the Urban Uses criteria, the Puente Hills site is compatible with zoning, would have minimal traffic impacts because of proximity to the Pomona and 605 freeways, and would not displace on-site improvements. Because of its size and topography, the Puente Hills site lends itself well to mitigation measures and shielding from surrounding land uses. With respect to Conservation-criteria, significant areas within the Puente Hills site would be left in their present state. As a minimum, Canyon 8 and 117 acres of the 151 acre parcel would be left in their present state. Because of biological significance, Canyon 7 and a large portion of Canyon 9 are being strongly considered as open space in a number of the fill designs. Much of the area to be filled is previously disturbed. Other Conservation criteria such as energy and materials recovery and air quality are met in a positive fashion by the Puente Hills site. For these reasons, no critical deficiencies were assigned to this site.

2) Partial Alternate Sites.

The seven sites which passed the initial screening as partial alternate sites were also subjected to the critical deficiency review. A summary of this evaluation is presented in Table V-6. (Discussion of partial alternate sites failing the critical deficiency review is contained in Appendix V-B). Two of the partial alternate sites passed the second screening process: Fish Canyon and Sierra Madre. However, both sites are located in the Angeles National Forest which is administered by the National Forest Service of th U.S. Department of Agriculture. Landfilling is not currently considered an eligible use of National Forest Land; however, the Sanitation Districts have held discussions with the National Forest Service regarding the possibility of using National Forest areas for landfilling purposes.[5]

Description of Partial Alternative Sites' Critical Deficiencies

Clamshell Canyon - Access to this site would bring refuse collection vehicles through narrow residential streets. An access road of between one-half to one mile would be required from existing roads to the actual site. Additionally, access would need to be made crossing a flood control channel.

Eaton Canyon - Like Clamshell Canyon, access to this site would be through narrow residential streets.

San Jose Hills - The Los Angeles County Department of Regional Planning has designated the land that this site encompasses as a Significant Ecological Area*, therefore, if utilized as a landfill would not be restorable to its present unique condition as an undisturbed native habitat.

Tonner Canyon - This site, presently used by the Boy Scouts of America as a campground and recreational area is also designated as a Significant Ecological Area*. It would not be restorable to its present condition as a unique native habitat, if landfilling were allowed to occur.

Tres Hermanos Canyon - This site owned and scheduled for development by the Urban Development Agency, City of Industry.

* County of Los Angeles General Plan, Special Management Area Map.

APPENDIX E

★1. SITE NAME: **MOONSHINE CANYON, WEST OF LIMEKILN**

USGS QUADRANGLE: **OAT MTN., T2N R16W NW1/4 SECTION 4 SBM**

DESCRIPTION: **BLUE LINE STREAM, FLOWS SOUTHEAST INTO TAMPA AVE. EAST OF BROWN'S CANYON, THIS SITE IS ON THE SOUTH SIDE OF SANTA SUSANA MOUNTAINS, SOUTH OF ALISO CANYON OIL FIELDS.**

LOCATION: **PLATE 1A THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX.**

Site Summary

The Moonshine Canyon site is located north of the 118 Freeway and west of Tampa Avenue in the hills north of the San Fernando Valley. It is a relatively undeveloped canyon near freeway access and was included as a possible landfill site based on these features.

Evaluation and Conclusion

Moonshine Canyon is located west of the City of Los Angeles Porter Ranch area. Brown Canyon, the Los Angeles Sanitation Districts site #91 is located immediately west of Moonshine Canyon. A review of the Aerial Photograph (Plate 1A, Photo Appendix) and the Oat Mtn. Quadrangle resulted in identifying the following Urban and Conservation Use code deficiencies, C3, C4, U1, U2, U3, U4 and U5. The mouth of Moonshine Canyon and the area downstream from this site contains the Moonshine Canyon Park (C3 and C4) which extends south intersecting Limekiln Canyon Park at Tampa Ave. Located in the Santa Susana Mountains, Moonshine Canyon contains a blue line stream which flows to the south, feeding Limekiln Canyon wash which is a major stream channel carrying flows south into San Fernando Valley.

Regional freeway access to this alternative would be from the 118 Freeway (State Highway 118) with the Tampa Avenue offramp providing surface street access north. Site access is gained from Tampa Avenue to Sesnon Boulevard. This access is through a single family residential community and through Limekiln Canyon Park, a recreational facility which parallels Tampa Avenue. This location is considered unsuitable because of the inability to isolate the canyon from the residential neighborhood overlooking the canyon from the east (U1 and U2); the inability to mitigate or buffer these uses from the effects of operating the landfill (U3); the effects of refuse disposal truck traffic along Tampa Avenue and Sesnon (U4); and conflicts with the recreational uses at the mouth of the canyon which would be displaced by landfilling activities. Based on these critical deficiencies, Moonshine Canyon was eliminated from further consideration as a regional landfill site.

★2. **SITE NAME:** **LIMEKILN CANYON**

USGS QUADRANGLE: **SAN FERNANDO T3N R14W SW 1/4 SECTION 19**

DESCRIPTION: **CANYON WITH BLUE LINE STREAM EXTENDING FROM RESIDENTIAL AREA TO THE ALISO CANYON OIL FIELDS**

LOCATION: **PLATE 1 THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Limekiln Canyon site is located north of the 118 Freeway and east of Moonshine Canyon in the hills north of the San Fernando Valley. This is a relatively undeveloped canyon with residences extending up to its entrance and the northern end located within the Aliso Canyon oil field.

Evaluation and Conclusion

Limekiln Canyon is located at the north end of San Fernando Valley between Moonshine Canyon and Aliso Canyon. Brown Canyon, the Los Angeles Sanitation Districts site #91 is located about 1.5 miles west of Limekiln Canyon. A review of the Aerial Photograph (Plate 1, Photo Appendix) and the Oat Mtn. Quadrangle resulted in identifying the following Service, Urban Use and Conservation code deficiencies: S1, S6, U4, U5 and C2. The mouth of Limestone Canyon and the area south from this site contains residential and conservation uses. Access to the site along Tampa Avenue would require refuse disposal trucks to traverse residential neighborhoods for over a mile (U4). Located in the Santa Susana Mountains, Limekiln Canyon contains a blue line stream which flows to the south, feeding Limekiln Canyon wash which is a major stream channel carrying flows south into San Fernando Valley.

Regional freeway access to this alternative would be from the 118 Freeway (State Highway 118) with the Tampa Avenue offramp providing surface street access north. Site access is gained from Tampa Avenue and once in the canyon a road would traverse north into the Aliso Canyon oil field. To develop a regional landfill at this location would require displacement of oil producing operations (U5); the cost of acquisition (S1) and site preparation (S6) with all of the pipelines and storage tanks makes this site unacceptable for a landfill location. It would not be possible to buffer the recreational uses at the mouth of the canyon, Limekiln Canyon Park. Based on these critical deficiencies, Limekiln Canyon was eliminated from further consideration as a regional landfill site.

*3.	SITE NAME:	INDIAN CANYON
	USGS QUADRANGLE:	SAN FERNANDO, T3N R14W SW1/4 SECTION 30
	DESCRIPTION:	INSIDE THE FOREST SERVICE BOUNDARY, A BLUE LINE STREAM, ACCESS FROM PAXTON STREET PAST RESIDENTIAL AND MOBILE HOME PARKS
	LOCATION:	PLATE 3 THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Indian Canyon site is located north of the 210 Freeway in a side canyon off of Lopez Canyon Road, east of Sylmar. This canyon extends for about 1/2 mile and contains a small school, the Lopez Canyon Forest Station and a gun club.

Evaluation and Conclusion

The Indian Canyon site is situated directly north of the existing Lopez Canyon landfill facility, northeast of Los Angeles and within the Angeles National Forest. A review of the aerial photograph (Plate 3, Photo Appendix) and the San Fernando Quadrangle resulted in identifying the following Urban Use and Conservation code deficiencies: U3, U4, U5, and C3. A prominent ridgeline separates Indian Canyon from the Lopez Canyon Landfill and separate access would have to be utilized to access the Indian Canyon site. Regional access via the Foothill (I-210) Freeway leads to local access gained from Glenoaks Blvd. and Paxton Street offramps leading to Lopez Canyon Road. Residences occur along these roads until Lopez Canyon Road is reached. Approximately 0.5 to 1 mile of travel through residential streets would be required to reach Lopez Canyon Road creating a critical access deficiency (U4). Lopez Canyon road is a heavily used large loop road through the National Forest accessing Glenhaven Memorial Park and descending down Kagel Canyon, north of Lakeview Terrace. Residential uses occur along this roadway, with a mobile home park located near the Indian Canyon Motorway access road to Indian Canyon,

This location is considered unsuitable because of the conflicts with the residential, educational, and recreational uses. To use Indian Canyon would cause the local school, the Forest Service Station and the Gun Club to be displaced (U5). With the mobile home park located at the mouth of the canyon it would not be feasible to buffer it from a landfill operating in the canyon (U3). Finally, recreational uses in the canyon, including the gun club, would be displaced and perhaps eliminated (C3). Based on these critical deficiencies, Indian Canyon was eliminated from further consideration as a regional landfill site.

★4.	**SITE NAME:**	**WEST LOPEZ CANYON**
	USGS QUADRANGLE:	**SAN FERNANDO, T3N R15W W1/2 SECTION 36**
	DESCRIPTION:	**INSIDE FOREST SERVICE BOUNDARY, BLUE LINE STREAM, ACCESS FROM PAXTON STREET, PAST RESIDENTIAL AREAS**
	LOCATION:	**PLATE 3 THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The West Lopez Canyon site is located north of the 210 Freeway in a side canyon west of Lopez Canyon Road and east of Sylmar. This canyon extends for about a mile and is relatively undeveloped. It is a small canyon that may not be large enough to support a regional landfill.

Evaluation and Conclusion

The West Lopez Canyon alternative site is situated northeast of Los Angeles within the Angeles National Forest and northeast of the existing Lopez Canyon landfill facility. A review of the aerial photograph (Plate 3, Photo Appendix) and the San Fernando Quadrangle resulted in identifying the following Urban Use code deficiency, U4. This alternative is west of Lopez Canyon Road and due west of the Indian Canyon site. Regional access via the Foothill (I-210) Freeway leads to local access gained from Glenoaks Blvd. and Paxton Street offramps leading to Lopez Canyon Road. Residences occur along these roads until Lopez Canyon Road is reached. Approximately 0.5 to 1 mile of travel through residential streets would be required to reach Lopez Canyon Road creating a critical access deficiency (U4). Lopez Canyon road is a heavily used large loop road through the National Forest accessing Glenhaven Memorial Park and descending down Kagel Canyon, north of Lakeview Terrace. Residential uses occur along this roadway, with a mobile home park located near the Indian Canyon Motorway access road to Indian Canyon. This location is considered unsuitable because of the access conflicts with the residential and recreational uses. Based on this critical deficiency, West Lopez Canyon was eliminated from further consideration as a regional landfill site.

*5.	**SITE NAME:**	**LOPEZ/INDIAN CANYON**
	USGS QUADRANGLE:	**SAN FERNANDO, T3N R14W W1/2 SECTION 31**
	DESCRIPTION:	**INSIDE FOREST SERVICE BNDY., BLUE LINE STREAM, ACCESS FROM PAXTON STREET PAST RESIDENTIAL AREAS.**
	LOCATION:	**PLATE 3, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

SITE SUMMARY

The Lopez/Indian Canyon site is located north of the 210 Freeway along the Lopez Canyon Road alignment, east of Sylmar. This canyon extends for several miles and contains a loop road with Kagel Canyon Road into Glenhaven Memorial Park.

Evaluation and Conclusion

The Lopez/Indian Canyon site is situated north and west of the existing Lopez Canyon landfill facility, northeast of Los Angeles and within the Angeles National Forest. A review of the aerial photograph (Plate 3, Appendix E) and the San Fernando Quadrangle resulted in identifying the following Urban Use and Conservation code deficiencies: U3, U4, U5 and C3. Regional access via the Foothill (I-210) Freeway leads to local access gained from Glenoaks Blvd. and Paxton Street offramps leading to Lopez Canyon Road. Residences occur along these roads until Lopez Canyon Road is reached. Approximately 0.5 to 1 mile of travel through residential streets would be required to reach Lopez Canyon Road creating a critical access deficiency (U4). Lopez Canyon Road is a heavily used large loop road through the National Forest accessing Glenhaven Memorial Park. Residential uses occur along this roadway, with a mobile home park located near the entrance into Lopez Canyon.

This location is considered unsuitable for further consideration because of the conflicts with the residential, educational, and recreational uses. To use Lopez/Indian Canyon would cause the local school, the Forest Service picnic area and Lopez Canyon Road to be displaced (U5 and C3). With the mobile home park located at the mouth of the canyon it would not be feasible to buffer it from a landfill operating in the canyon (U3). Based on these critical deficiencies, Lopez/Indian Canyon was eliminated from further consideration as a regional landfill site.

*6.	**SITE NAME:**	**HERRIK CANYON**
	USGS QUADRANGLE:	**SUNLAND, T3N R14W SECTIONS 32 & 33**
	DESCRIPTION:	**INSIDE FOREST SERVICE BOUNDARY, ACCESS FROM OSBORNE ST./LITTLE TUJUNGA ROAD, ACCESS PROXIMATE TO HOSPITAL.**
	LOCATION:	**PLATE 3, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Herrik Canyon site is located north of the 210 Freeway north of Little Tujunga Road on Marek Mountainway. This canyon is approximately a mile long and opens onto Little Tujunga Canyon creek.

Evaluation and Conclusion

The Herrik Canyon site is located north of the community of Lakeview Terrace within the boundary of the Angeles National Forest. A review of the aerial photograph (Plate 3, Photo Appendix) and Sunland Quadrangle resulted in identifying the following Urban Use and Conservation code deficiencies: U1, U2, U3, U4, U5, C1 and C2. Herrik Canyon is accessed from the Foothill Freeway and Osborne Street in the community of Lakeview Terrace. Access is through a residential community with both recreational and medical facilities along the access route (U4). A portion of the route traverses along Little Tujunga Canyon before it enters into Herrik Canyon.

Residences are located in Herrik Canyon and would have to be displaced by a regional landfill at this location or would be located adjacent to the landfill with no potential to mitigate potential adverse effects of landfilling activities (U1, U2, U3 and U5). A portion of the route is adjacent to one of the major percolation basins in the San Fernando Valley, Little Tujunga Canyon creek and Hansen Dam. The location of a landfill upstream of this sensitive water management facility is a further conflict that makes Herrik Canyon unacceptable as a landfill site (C1 and C2). Based on these critical deficiencies, Herrik Canyon was eliminated from further consideration as a regional landfill site.

★7.	**SITE NAME:**	**DAYTON CREEK CANYON**
	USGS QUADRANGLE:	**CALABASAS, T1N R17W SECTION 18**
	DESCRIPTION:	**ACCESS VIA ROSCOE BLVD. THROUGH RESIDENTIAL AREA, EAST FACE OF SIMI HILLS, SIGNIFICANT ECOLOGICAL AREA PER LA GENERAL PLAN**
	LOCATION:	**PLATE 5, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Dayton Creek Canyon site is located in the West Hills at the end of Roscoe Boulevard, just north of Bell Canyon Park. This canyon contains a blue line stream that flows out of the Simi Hills into the San Fernando Valley.

Evaluation and Conclusion

The Dayton Creek Canyon site is located just south of Chatsworth Reservoir in a rapidly urbanizing portion of the Simi Hills. A review of the aerial photograph (Plate 5, Photo Appendix) and the Calabasas Quadrangle resulted in identifying the following Urban Use and Conservation code deficiencies: U2, U3, U4, C1 and C2. Dayton Creek Canyon is located at the Ventura/Los Angeles County line, west of Canoga Park. Situated approximately midway between the Ventura Freeway (101) and the Simi Freeway (118) access to the site would be over several miles of residential streets. Surface street access is most easily achieved via Valley Circle Blvd from the Ventura Freeway, a primary north/south arterial. Access is a primary critical deficiency (U4).

The entrance to the canyon contains several residences and the hills to the north are being developed into residential neighborhoods. A regional landfill cannot be constructed at this location without causing unmitigable impacts on the surrounding rural/suburban residential uses (U2 and U3). The area is designated as a Significant Ecological Area on the Los Angeles General Plan which makes this site critically deficient from an ecological and restorability standpoint (C1 and C2). This location is considered unsuitable for further consideration because of the conflicts with the residential, ecological and recreational values. Based on these critical deficiencies, Dayton Creek Canyon was eliminated from further consideration as a regional landfill site.

*8. **SITE NAME:** **SOUTH DAYTON CREEK CANYON**

USGS QUADRANGLE: **CALABASAS, T1N R17W SECTION 18**

DESCRIPTION: **ACCESS VIA ROSCOE BLVD. THROUGH RESIDENTIAL AREAS, ON THE EAST FACE OF THE SIMI HILLS**

LOCATION: **PLATE 5, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The South Dayton Creek Canyon site is located in the West Hills at the end of Roscoe Boulevard, just north of Bell Canyon Park and south of Dayton Creek Canyon.

Evaluation and Conclusion

The South Dayton Creek Canyon site is located just south of Dayton Creek Canyon in a rapidly urbanizing portion of the Simi Hills. A review of the aerial photograph (Plate 5, Photo Appendix) and the Calabasas Quadrangle resulted in identifying the following Urban Use and Conservation code deficiencies: U2, U3, U4, C1 and C2. Dayton Creek Canyon is located at the Ventura/Los Angeles County line, west of Canoga Park. Situated approximately midway between the Ventura Freeway (101) and the Simi Freeway (118), access to the site would be over several miles of residential streets. Surface street access is most easily achieved via Valley Circle Blvd from the Ventura Freeway, a primary north/south arterial. Access is a primary critical deficiency (U4).

The entrance to the canyon contains several residences and the hills to the north are being developed into residential neighborhoods. A regional landfill cannot be constructed at this location without causing unmitigable impacts on the surrounding rural/suburban residential uses (U2 and U3). The area is designated as a Significant Ecological Area on the Los Angeles General Plan which makes this site critically deficient from an ecological and restorability standpoint (C1 and C2). This location is considered unsuitable because of the conflicts with the residential, ecological and recreational values. Based on these critical deficiencies, Dayton Creek Canyon was eliminated from further consideration as a regional landfill site.

+9. SITE NAME: **CHATSWORTH RESERVOIR**

USGS QUADRANGLE: **CALABASAS, T2N R17W W1/2 SECTION 23**

DESCRIPTION: **WEST OF HIGHWAY 27, RESIDENTIAL AREA TO THE WEST, TRANSITIONING TO A LARGE INDUSTRIAL COMPLEX. MINERAL RESOURCE AREA ON LA GENERAL PLAN**

LOCATION: **PLATE 6, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Chatsworth Reservoir site is located in the West Hills portion of San Fernando Valley, just off Topanga Canyon Boulevard, about three miles south of the 118 Freeway.

Evaluation and Conclusion

The Chatsworth Reservoir site is located east of the Ventura/Los Angeles County line and west of Canoga Park. The site is situated approximately midway between the Ventura Freeway (101) and the Simi Freeway (State Highway 118) which provide regional access. A review of the aerial photograph (Plate 6, Photo Appendix) and the Calabasas Quadrangle resulted in identifying the following Urban Use deficiencies: U1, U2, U3, U4, U5 and C3. Surface street access is from Valley Circle Blvd, a primary north/south arterial with fully improved freeway on/off ramps. Access passes through a predominantly single family residential area, with scatted commercial uses located at the major intersections. Access impact is a primary critical deficiency for this site (U4)

The Chatsworth Reservoir site is a major flood control and percolation basin in the San Fernando Valley. Using this site for a regional landfill would displace this critical flood control facility which cannot be readily replaced (U5). The Chatsworth Reservoir collects runoff from Santa Susana Creek drainage. The location of a landfill within this sensitive water management facility is a further conflict that makes Chatsworth Reservoir unacceptable as a landfill site. This location is considered unsuitable because of the conflicts with the residential, recreational uses (C3), and flood control/water conservation uses. A regional landfill at this location could not be isolated and buffered from the surrounding residential uses (U1, U2 and U3). Based on these critical deficiencies, Chatsworth Reservoir was eliminated from further consideration as a regional landfill site.

★10. SITE NAME: **HANSEN DAM FLOOD CONTROL**

USGS QUADRANGLE: **SAN FERNANDO, T2N R14W SECTION 7&8**

DESCRIPTION: **210 FREEWAY ACCESS, FLOOD CONTROL/RECREATION FACILITY.**

LOCATION: **PLATE 9, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Hansen Dam Flood Control site is located in the Tujunga area and serves as a flood control basin and recreation in that portion of Los Angeles.

Evaluation and Conclusion

The Hansen Dam Flood Control site is located upstream of the impoundment area from Hansen Dam in the City of Los Angeles between the communities of Lake View Terrace to the north and Pacoima to the southwest. A review of the aerial photograph (Plate 9, Photo Appendix) and the San Fernando Quadrangle resulted in identifying the following Service, Urban Use and Conservation code deficiencies: S3, S5, U3, U5, C1 and C3. Regional freeway access to the site is gained from the Foothill Freeway (210), and the Foothill Blvd. offramp. The Golden State Freeway (5) also provides regional access, with Osborne or Sheldon Street providing primary arterial surface street access, passing through commercial and residential areas. Access to the site could be obtained without adversely affecting surrounding residential areas.

However, Hansen Dam's primary function is flood control, and it also serves as a major recreation area. Hansen Dam stores runoff from the Tujunga Wash, a major natural drainage area with a large watershed which originates in the San Gabriel Mountains. The site's coarse alluvium consisting of sand, gravel, and cobble materials is not suitable as a geologic base for a landfill nor as suitable cover/fill material for landfill uses, according to RWQCB findings (S3 and S5). The Hansen Dam site is located within one of the major percolation/flood control basins in the northeast San Fernando Valley and disposal of waste at this site would create a major concern for ground water quality (C1). The site is not isolated from surrounding uses and landfilling activities could not be mitigated or buffered from surrounding uses (U3). Use of this site for a regional landfill would require displacing this use and relocating flood control facilities which would be prohibitively expensive, if feasible (U5). Use of this site would also displace a major recreational facility (C3). Based on these critical deficiencies, Hansen Dam Flood Control site was eliminated from further consideration as a regional landfill site.

*11.	SITE NAME:	LAS FLORES CANYON
	USGS QUADRANGLE:	MT. WILSON, T2N R12W SECTION 34
	DESCRIPTION:	ACCESS VIA LAKE BLVD. THROUGH RESIDENTIAL NEIGHBORHOODS, PARTIALLY WITHIN FOREST SERVICE BOUNDARY
	LOCATION:	PLATE 20, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Las Flores Canyon site is located north of Altadena in the San Gabriel Mountain foothills at the end of Lake Street. This canyon lies west of Eaton Canyon (Site #87 of the 101 Sanitation Districts sites) adjacent to a residential neighborhood.

Evaluation and Conclusion

Las Flores Canyon is a south-facing canyon, located north of the City of Altadena, partially within the Angeles National Forest boundaries. A review of the aerial photograph (Plate 20, Photo Appendix) and the Mt. Wilson Quadrangle resulted in identifying the following Urban Use deficiency codes: U1, U3, U4 and U5. Regional Freeway access is from the Foothill Freeway (210), with surface street access from Fair Oaks Ave, or Lake Ave.; both are north/south primary roadways which pass through some commercial but predominantly older residential areas, with churches, library, and cemetery uses along these alignments. Utilization of existing street networks would result in approaching the site through more than three miles of established residential areas (U4).

Residential areas are located in the mouth of the canyon and the canyon's north-south alignment would make it impossible to mitigate the effects of landfilling activities (U1 and U3). Use of this site for a regional landfill would cause removal of a water storage reservoir and some of the residences (U5). Based on these critical deficiencies, the Las Flores Canyon site was eliminated from further consideration as a regional landfill site.

★12. **SITE NAME:** **RUBIO CANYON**

USGS QUADRANGLE: **MT. WILSON, T2N R12W SW1/4 SECTION 35**

DESCRIPTION: **ACCESS VIA LAKE BLVD. THROUGH RESIDENTIAL NEIGHBORHOODS, SITE IS PARTIALLY WITHIN FOREST SERVICE BOUNDARY.**

LOCATION: **PLATE 20, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Rubio Canyon site is located north of Altadena in the San Gabriel Mountain foothills north and east of Lake Street. This canyon lies east of Las Flores Canyon and has an old railroad grade leading up the canyon and has a blue line stream shown.

Evaluation and Conclusion

The Rubio Canyon site is a south facing canyon in the San Gabriel Mountains, located north of Altadena and within the Angeles National Forest boundary. A review of the aerial photograph (Plate 20, Photo Appendix) and the Mt. Wilson Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U3, U4, and C2. Rubio Canyon contains a blue line stream channel which drains into the Rubio debris basin. The potential for damage to these facilities and to ground water resources from a landfill upstream is considered a critical deficiency (C2).

Regional freeway access is from the Foothill Freeway (210), with surface street access from Fair Oaks Ave, or Lake Ave.; both are north/south primary roadways which pass through some commercial but predominantly older residential areas, with churches, library, and cemetery uses along these alignments. Utilization of existing street networks would result in approaching the site through more than three miles of established residential areas (U4). Residential areas are located in the mouth of the canyon and the canyon's north-south alignment would make it impossible to mitigate the effects of landfilling activities (U1 and U3). Based on these critical deficiencies, the Las Flores Canyon site was eliminated from further consideration as a regional landfill site.

★13.	SITE NAME:	SOUTH OF EATON CANYON PARK
	USGS QUADRANGLE:	MT. WILSON, T1N R12W SECTION 7
	DESCRIPTION:	UNNAMED CANYON NORTHEAST AND ADJACENT TO EATON CANYON PARK WITH ACCESS THROUGH RESIDENTIAL AREAS VIA ALTADENA DRIVE
	LOCATION:	PLATE 20, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

This canyon site is located northeast of Altadena in the San Gabriel Mountain foothills north and east of Eaton Canyon Park. It would require access through Eaton Canyon Park or from the residential area to the southeast.

Evaluation and Conclusion

This canyon site is located east of Eaton Canyon Park in the San Gabriel Mountains which is located in north portion of Altadena city limits and within the Angeles National Forest boundary. A review of the aerial photograph (Plate 20, Photo Appendix) and the Mt. Wilson Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U3, U4, U5 and C3. The location adjacent to the Park and possible access through it create a major conflict with this important regional park facility (C3).

Regional freeway access is from the Foothill Freeway (210), with surface street access from Sierra Madre Blvd., or North Altadena Drive; both are north/south primary roadways which pass through some commercial but predominantly older residential areas (U4). Secondary road access is provided by Minneloa Canyon Road or Pinecrest Drive (a local residential street leading to Mt. Wilson Drive, a dirt roadway entering Forest Service land which is a long access route with a narrow roadway, very sharp curves and moderate to steep road grades). A large single residence is located on the ridge above the canyon that would have to be displaced by a regional landfill (U5) and the residences south of the site would be exposed to landfill operations that could not be fully buffered or isolated from the landfilling operations (U1 and U3). Based on these critical deficiencies, this canyon site was eliminated from further consideration as a regional landfill site.

★14. **SITE NAME:** **HASTINGS CANYON**

USGS QUADRANGLE: **MT. WILSON, T1N R12W SECTION 18**

DESCRIPTION: **SOUTH FACING CANYON CONTAINING BLUE LINE STREAM, SITE IS WITHIN FOREST SERVICE BOUNDARY, ACCESS PROVIDED BY NARROW RESIDENTIAL STREETS**

LOCATION: **PLATE 20A, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Hastings Canyon site is located north of Pasadena between Eaton Canyon and Little Santa Anita Canyon in the San Gabriel Mountain foothills. The canyon is short and is directly visible from the residential areas south of the canyon.

Evaluation and Conclusion

The Hastings Canyon site is located at the edge of the City of Pasadena just within the Angeles National Forest boundary. The canyon contains a blue line stream channel and is directly visible to the adjacent residential areas. A review of the aerial photograph (Plate 20A, Photo Appendix) and the Mt. Wilson Quadrangle resulted in identifying the following Urban Use deficiency codes: U1, U2, U3, and U4. Regional freeway access is from the Foothill Freeway (210) with surface street access from Sierra Madre Boulevard or Michillinda Avenue over approximately 2 miles of road. Both access routes are north/south primary roadways which pass through some commercial but predominantly older residential areas. Direct road access to the site is provided by Hastings Ranch Drive, a local residential street and a circuitous access route along a narrow roadway with very sharp curves and moderate to steep road grades (U4).

Hastings Canyon opens directly to the residential areas with no possibility of landfilling operations being buffered from the existing residential neighborhoods (U1, U2, and U3). Based on these critical deficiencies, Hastings Canyon was eliminated from further consideration as a regional landfill site.

★15.	SITE NAME:	BAILEY CANYON
	USGS QUADRANGLE:	MT. WILSON, T1N R11W SECTION 8 SW 1/4
	DESCRIPTION:	SOUTH FACING CANYON CONTAINING BLUE LINE STREAM AND THE MOUTH OF THE CANYON CONTAINS BAILEY CANYON WILDERNESS PARK
	LOCATION:	PLATE 20A, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Bailey Canyon site is located north of Sierra Madre east of Hastings Canyon in the San Gabriel Mountain foothills. This is a moderate sized canyon that drains directly south out of the mountains and is directly visible from the residential areas south of the canyon.

Evaluation and Conclusion

The Bailey Canyon site is a south-facing canyon in the San Gabriel Mountains, located in the north portion of City of Sierra Madre. A review of the aerial photograph (Plate 20A, Photo Appendix) and the Mt. Wilson Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U2, U3, U4, U5 and C3. Bailey Canyon Wilderness Park occupies the southern portion of this canyon and would be adversely impacted and displaced if this site were developed and operated as a regional landfill (U5 and C3)

Regional freeway access to Bailey Canyon is from the Foothill Freeway (210) with surface street access from Sierra Madre Boulevard or Michillinda Avenue, both north/south primary roadways which pass through some commercial but predominantly older residential areas. Travel to the site from the freeway is over two miles of local roads through these areas which creates a critical deficiency for the site (U4). Secondary road access is provided via Grandview Avenue to Oak Crest Drive, a local residential street leading to Angeles National Forest boundary at bottom of canyon. The canyon is visible to the residents and it would not be possible to isolate a regional landfill in Bailey Canyon from the residential uses at the mouth of the canyon (U1, U2 and U3). Based on these critical deficiencies, Bailey Canyon was eliminated from further consideration as a regional landfill site.

★16. SITE NAME: **MONROVIA CANYON**

USGS QUADRANGLE: **AZUSA, T1N R10W SECTION 13 N1/2**

DESCRIPTION: **RESIDENTIAL AREA PROVIDES ACCESS TO CANYON ROAD, UPSTREAM FROM SAWPIT DAM**

LOCATION: **PLATE 20B, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Monrovia Canyon site is located off of Sawpit Canyon in the San Gabriel Mountains and within the Angeles Nation Forest boundary.

Evaluation and Conclusion

The Monrovia Canyon site is a south-facing canyon in the San Gabriel Mountains, north of the City of Monrovia, located entirely within the Angeles National Forest. This canyon opens onto Sawpit Canyon just upstream from Sawpit Dam. A review of the Aerial Photograph (Plate 20B, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U2, U3, U4, U5, C1 and C3. The primary onsite deficiencies include the Monrovia Mountain Park site located within the Canyon which would have to be displaced (U5 and C3) and the significant water storage facility located at the mouth of Monrovia Canyon behind Sawpit Dam (C1). The loss or adverse impact to these facilities would constitute critical deficiencies.

In addition, regional freeway access is from the Foothill Freeway (210) with surface street access from Myrtle Avenue, a north/south primary roadway which passes through predominantly older residential areas, leading to the secondary or local road system. This secondary access is via Scenic Drive which passes through a hillside residential area leading to North Canyon Truck Trail which passes through Monrovia Canyon Park before it enters the Angeles National Forest boundary at bottom of the canyon along Sawpit Canyon (U4). Residences are located within Sawpit Canyon and on the western ridge with direct visibility into the canyon. A regional landfill could not be constructed and operated in Monrovia Canyon without adversely affecting these residences. Their location prevents adequate mitigation or isolation of a landfill from the residences (U1, U2, U3). Based on these critical deficiencies, Monrovia Canyon was eliminated from further consideration as a regional landfill site.

★17. SITE NAME: **SPANISH CANYON**

USGS QUADRANGLE: **AZUSA, T1N R11W SECTION 13 S1/2**

DESCRIPTION: **RESIDENTIAL AREA PROVIDES ACCESS TO CANYON ROAD, NORTH OF MONROVIA**

LOCATION: **PLATES 20B AND 29, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Spanish Canyon site is located east of Sawpit Canyon in the San Gabriel Mountains and north of the City of Monrovia. Only the upper portion of the canyon is located within the Angeles National Forest boundary.

Evaluation and Conclusion

Spanish Canyon is one of the few east-west trending canyons located in the San Gabriel Mountain foothills. This canyon opens onto Sawpit Canyon at the point where it opens onto the San Gabriel Valley. A review of the Aerial Photograph (Plates 20B and 29, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S1, U1, U2, U3, U4, U5 and C2. The primary service deficiency is the occurrence of the MWD Upper Feeder Line which runs parallel to the canyon for more than a mile. This creates a critical deficiency for acquirability and displacement of a regional water supply facility (S1 and U5).

Regional freeway access is from the north terminus of the San Gabriel River Freeway (605), with surface street access from Mt. Olive Drive, a north/south primary roadway to Royal Oak where it becomes a local roadway which passes through a private gated hillside residential area with large homes. The private local road access to the site is via Woodlyn Lane, and Spanish Canyon Motorway. This private street network leads north to Spanish Canyon. This location is considered unsuitable because of the conflicts with the residential uses, lack of public access through the residential areas and the long narrow hillside curving road network (U1, U2, U3 and U4). A large residential development is located directly across Sawpit Canyon which looks directly into it. It is not possible to isolate a regional landfill at this location. Finally, debris and percolation basins are located just downstream of Spanish Canyon and the development of a regional landfill would threaten a major water recharge site (C2). Based on these critical deficiencies, Spanish Canyon was eliminated from further consideration as a regional landfill site.

★18. SITE NAME: BLISS CANYON

USGS QUADRANGLE: AZUSA, T1N R10W SECTION 10 NE1/4

DESCRIPTION: ACCESS THROUGH PRIVATE COMMUNITY, RESIDENTIAL AREA AND PRIVATE ROADS IN COMMUNITY OF BRADBURY

LOCATION: PLATE 29, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Bliss Canyon site is located north of the City of Azusa in the private community of Bradbury. The site is located in the San Gabriel Mountain foothills and only the upper portion of the canyon is located within the Angeles National Forest boundary.

Evaluation and Conclusion

Bliss Canyon is located southeast of and adjacent to Spanish Canyon in the San Gabriel Mountain foothills, north of the City of Azusa and east of the L.A. Sanitation Districts Fish Canyon site (#95). A review of the aerial photograph (Plate 29, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Urban Use deficiency codes: U1, U2, U3, U4 and U5. The entrance to the canyon contains a major flood control debris basin which would be displaced if a regional landfill was constructed at this location (U5).

Regional freeway access is from the north terminus of the San Gabriel River Freeway (605), and the Foothill Freeway (210) with surface street access from Huntington Drive, an east/west primary roadway which passes through predominantly multiple residential and incidental commercial uses. Highland Avenue provides access to the private community of Bradbury and Woodlyn Road provides access to Bliss Canyon through Bradbury. Access to the site through these urban areas causes a critical deficiency (U4). Residences extend up to the mouth of the canyon and it would not be possible to isolate them from regional landfill operations in Bliss Canyon (U1, U2 and U3). Based on these critical deficiencies, Bliss Canyon was eliminated from further consideration as a regional landfill site.

★19. SITE NAME: BRADBURY CANYON

USGS QUADRANGLE: AZUSA, T1N R10W SECTION 10 NE1/4

DESCRIPTION: ACCESS THROUGH PRIVATE COMMUNITY, RESIDENTIAL AREA AND PRIVATE ROADS IN THE COMMUNITY OF BRADBURY

LOCATION: PLATE 29, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Bradbury Canyon site is located north of the City of Azusa in the private community of Bradbury. The site is located in the San Gabriel Mountain foothills and only the upper portion of the canyon is located within the Angeles Nation Forest boundary.

Evaluation and Conclusion

Bradbury Canyon is located west of and adjacent to Bliss Canyon in the San Gabriel Mountain foothills, north of the City of Azusa and east of the L.A. Sanitation Districts Fish Canyon site (#95). A review of the aerial photograph (Plate 29, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Urban Use deficiency codes: U1, U2, U3, U4 and U5. The entrance to the canyon contains a major flood control debris basin which would be displaced if a regional landfill was constructed at this location (U5).

Regional freeway access is from the north terminus of the San Gabriel River Freeway (605), and the Foothill Freeway (210), with surface street access from Huntington Drive, an east/west primary roadway which pass through predominantly multiple residential and incidental commercial uses. Highland Avenue provides access to the private community of Bradbury and Woodlyn Road provides access to Bradbury Canyon through Bradbury. Access to the site through these urban areas causes a critical deficiency (U4). Residences extend up to the mouth of the canyon and it would not be possible to isolate them from regional landfill operations in Bradbury Canyon (U1, U2 and U3). Based on these critical deficiencies, Bradbury Canyon was eliminated from further consideration as a regional landfill site.

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★20, 21 and 22. SITE NAME: **SANTA FE FLOOD CONTROL BASIN 3 SITES**

USGS QUADRANGLE: **AZUSA, T1N R10W SECTION 31,32**

DESCRIPTION: **LARGE FLOOD CONTROL BASINS, USE HAS BEEN DIVIDED BY ROADWAYS IN SAN GABRIEL RIVER FLOOD PLAIN**

LOCATION: **PLATE 29, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Santa Fe Flood Control Basin(s) is situated in the San Gabriel River flood plains approximately 2.5 miles southwest of the San Gabriel Mountain foothills where the river exits the foothills.

Evaluation and Conclusion

The Santa Fe Flood Control Basin(s) is located in the largest drainage system contained in the San Gabriel Mountain range. These basins serve a major flood protection role and are designated as a Significant Ecological Area on the Los Angeles County General Plan. A review of all three sites on the aerial photograph (Plate 29, Photo Appendix) and the Azusa and Baldwin Park Quadrangles resulted in identifying the following Service, Urban use and Conservation deficiency codes: S3, S5, U5, C1, C2 and C3. These basins impound water from the San Gabriel River for conservation and flood control purposes and provide a regional recreation area. Use of these three basins for a regional landfill would displace these critical flood control facilities (U5).

The site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill or base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site. These are critical deficiencies S3 and S5.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses.
Land uses in the area are industrial, mining associated with sand and gravel extraction, and recreation/open space. The conflict with recreation and open space values, such as the Significant Ecological Area designation, causes additional critical deficiencies (C1, C2, and C3). Based on these critical deficiencies, these three basin sites were eliminated from further consideration as a regional landfill site.

★23. SITE NAME: ARROW HIGHWAY/BUENA VISTA BASIN

USGS QUADRANGLE: BALDWIN PARK, T1S R11W SECTION 1 NE 1/4

DESCRIPTION: PORTION OF LARGE FLOOD CONTROL BASIN IN BALDWIN PARK ADJACENT TO SANTA FE FLOOD CONTROL BASIN

LOCATION: PLATE 39, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The next major percolation basin west of Santa Fe Basins is situated in the San Gabriel River flood plain between north of Arrow Highway and Buena Vista Street, west of the San Gabriel Freeway and south of the Foothill Freeway.

Evaluation and Conclusion

The basin is located in the largest drainage system contained in the San Gabriel Mountain range. This basin serves a flood protection role and is still being mined and has a designation as a Mineral Resource Zone. A review of this site on the aerial photograph (Plate 39, Photo Appendix) and the Baldwin Park Quadrangle resulted in identifying the following Service and Urban Use deficiency codes: S3, S5, and U5. This basin impounds water from the San Gabriel River for conservation and flood control purposes and provides a regional sand and gravel mineral resource which is still being mined. Use of this basin for a regional landfill would displace these flood control facilities and the mining operations (U5).

The site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill or base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site. These are critical deficiencies S3 and S5.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses. Land uses in the area are industrial mining associated with sand and gravel extraction, and recreation/open space. The conflict with these uses contributes to the site's critical deficiencies. Based on these critical deficiencies, this basin site was eliminated from further consideration as a regional landfill site.

*24.	SITE NAME:	LIVE OAK AVE, WEST
	USGS QUADRANGLE:	BALDWIN PARK, T1S R11W SECTION 1 SW 1/4
	DESCRIPTION:	OLD GRAVEL PIT IN MINERAL RESOURCE ZONE IN SAN GABRIEL RIVER FLOOD PLAIN
	LOCATION:	PLATE 39, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

A series of percolation basins that are located on both sides of Live Oak Avenue west of the San Gabriel River in the City of Irwindale.

Evaluation and Conclusion

The Live Oak Avenue, West is a sand and gravel pit currently used to reduce flood flows and percolate runoff from the San Gabriel Mountains into the San Gabriel River flood plain. This site is located downstream of the Santa Fe Dam which impounds water for flood control purposes and provides a regional recreation area in the City of Irwindale. A review of this site on the aerial photograph (Plate 39, Photo Appendix) and the Baldwin Park Quadrangle resulted in identifying the following Service and Urban Use deficiency codes: S3, S5 and U5. This basin percolates water from the San Gabriel River and serves to increase ground water supplies for the San Gabriel Valley. Use of this basin for a regional landfill would displace these percolation basins and remove the area from further mining (U5).

Located along the west bank of the San Gabriel River, the site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill material or a geologic-base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board (S3 and S5). Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses. Access to the site is via the 605 Freeway to the Live Oak Ave offramp, a secondary roadway. The location of a landfill within this sensitive water management area and in a Mineral Resource Zone is a conflict that makes the Live Oak Avenue West alternative unacceptable as a landfill site. Based on these critical deficiencies, this basin site was eliminated from further consideration as a regional landfill site.

*25.	SITE NAME:	LIVE OAK AVE., EAST
	USGS QUADRANGLE:	BALDWIN PARK, T1S R11W SECTION 6 SW 1/4
	DESCRIPTION:	OLD GRAVEL PIT IN MINERAL RESOURCE ZONE IN SAN GABRIEL RIVER FLOOD PLAIN
	LOCATION:	PLATE 39, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

This site is a very large sand and gravel mining area with several completed pits that are used for percolation of surface flows in the San Gabriel River. The site is located southeast of Live Oak Avenue but west of the San Gabriel Freeway.

Evaluation and Conclusion

The Live Oak Avenue, East is a sand and gravel pit currently used to store flood flows and percolate surface runoff from the San Gabriel Mountains into the San Gabriel River flood plain. This site is located downstream of the Santa Fe Dam which impounds water for flood control purposes and provides a regional recreation area in the City of Irwindale. A review of this site on the aerial photograph (Plate 39, Photo Appendix) and the Baldwin Park Quadrangle resulted in identifying the following Service and Urban Use deficiency codes: S3, S5 and U5. This basin percolates water from the San Gabriel River and serves to increase ground water supplies for the San Gabriel Valley. Use of this basin for a regional landfill would displace these percolation basins and remove the area from further mining (U5).

Located along the west bank of the San Gabriel River, the site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill material or a geologic base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board (S3 and S5). Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses. Access to the site is via the 605 Freeway to the Live Oak Ave offramp, a secondary roadway. The location of a landfill within this sensitive water management area and in a Mineral Resource Zone is a conflict that makes the Live Oak Avenue East alternative unacceptable as a landfill site. Based on these critical deficiencies, this basin site was eliminated from further consideration as a regional landfill site.

*26.	**SITE NAME:**	**RAMONA BOULEVARD BASIN**
	USGS QUADRANGLE:	**BALDWIN PARK, T1S R11W SECTION 13 W 1/2**
	DESCRIPTION:	**OLD GRAVEL PITS AND ACTIVE MINES IN MINERAL RESOURCE ZONE IN SAN GABRIEL RIVER FLOOD PLAIN**
	LOCATION:	**PLATE 39, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

This site is a large sand and gravel mining area with several completed pits that are used for percolation of surface flows in the San Gabriel River. The site is located east of the San Gabriel Freeway between Los Angeles Street and Ramona Boulevard.

Evaluation and Conclusion

The Ramona Boulevard Basin site consists of an active sand and gravel mine and sand and gravel pits currently used to store flood flows and percolate surface runoff from the San Gabriel Mountains into the San Gabriel River flood plain. This site is located downstream of the Santa Fe Dam which impounds water for flood control purposes and provides a regional recreation area in the City of Irwindale. A review of this site on the aerial photograph (Plate 39, Photo Appendix) and the Baldwin Park Quadrangle resulted in identifying the following Service and Urban Use deficiency codes: S3, S5 and U5. This basin percolates water from the San Gabriel River and serves to increase ground water supplies for the San Gabriel Valley. Use of this basin for a regional landfill would displace these percolation basins and remove the area from further mining (U5).

Located along the east bank of the San Gabriel River, the site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill material or a geologic base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board (S3 and S5). Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses. Access to the site is via the 605 Freeway to the Ramona Boulevard offramp, a major arterial locally. The location of a landfill within this sensitive water management area and in a Mineral Resource Zone is a conflict that makes the Ramona Boulevard Basin alternative unacceptable as a landfill site. Based on these critical deficiencies, this basin site was eliminated from further consideration as a regional landfill site.

*27. SITE NAME: LOS ANGELES STREET

USGS QUADRANGLE: BALDWIN PARK, T1S R11W SECTION 8 NE 1/4

DESCRIPTION: OLD GRAVEL PITS AND ACTIVE MINES IN MINERAL RESOURCE ZONE EAST OF THE SAN GABRIEL RIVER FLOOD PLAIN

LOCATION: PLATE 39, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

This site is a large sand and gravel mining area with several completed pits that are used for percolation of surface flows in the San Gabriel River. The site is located about a mile east of the San Gabriel Freeway and is north of Los Angeles Street.

Evaluation and Conclusion

The Los Angeles Street site consists of an active sand and gravel mine and sand and gravel pits currently used to store flood flows and percolate surface runoff from the San Gabriel Mountains into the San Gabriel River alluvial fan. This site is located downstream, south, of the Santa Fe Dam which impounds water for flood control purposes and provides a regional recreation area in the City of Irwindale. A review of this site on the aerial photograph (Plate 39, Photo Appendix) and the Baldwin Park Quadrangle resulted in identifying the following Service and Urban Use deficiency codes: S3, S5 and U5. This basin percolates water from the San Gabriel River and serves to increase ground water supplies for the San Gabriel Valley. Use of this basin for a regional landfill would displace these percolation basins and remove the area from further mining (U5).

Located east of the San Gabriel River, the site's coarse alluvium consisting of sand, gravel, and cobble materials is not a suitable cover/fill material or a geologic base material for landfill uses, according to a policy adopted by the Regional Water Quality Control Board (S3 and S5). Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site.

Regional freeway access to these basins is very good and would not conflict with surrounding land uses. Access to the site is via the 605 Freeway to the Arrow Highway or Ramona Boulevard offramp to Los Angeles Street, a major arterial locally. The location of a landfill within this sensitive water management area and in a Mineral Resource Zone is a conflict that makes the Los Angeles Street site unacceptable as a landfill site. Based on these critical deficiencies, this basin site was eliminated from further consideration as a regional landfill site.

***28. SITE NAME:** **SYCAMORE CANYON**

USGS QUADRANGLE: **WHITTIER, T2S R12W SECTION 16 NW 1/2**

DESCRIPTION: **NORTHEAST OF WHITTIER COLLEGE, RESIDENTIAL AREA, ADJACENT TO CEMETERY**

LOCATION: **PLATE 55, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Sycamore Canyon site is located immediately east of the Whittier city limits, south of Turnbull Canyon Road. This site is located in the western portion of the Puente Hills.

Evaluation and Conclusion

Sycamore Canyon is located immediately east of the Whittier city limits, south of Turnbull Canyon Road. This west-facing canyon contains a blue line stream and Rose Hills Memorial Park is immediately west the site, across Turnbull Canyon Road. A review of the aerial photograph (Plate 55, Photo Appendix) and the Whittier Quadrangle resulted in identifying the following deficiency codes: U1, U2, U3, U4, U5 and C2 and C4. The primary onsite deficiency is the open space designation in the Los Angeles County General Plan which would be eliminated by developing a regional landfill at this location (U5 and C4).

Regional access to the site is obtained from the San Gabriel River Freeway about two miles west of the site. Access from the west along Beverly Boulevard and a residential hillside local street system poses a major access deficiency (U4). Residential uses and Whittier College are located at the mouth of the canyon and landfilling operations could not be isolated from these land uses (U1, U2 and U3). Based on these critical deficiencies, Sycamore Canyon was eliminated from further consideration as a regional landfill site.

***29. SITE NAME:** **CALIFORNIA CANYON**

USGS QUADRANGLE: **WHITTIER, T2S R12W SECTION 22**

DESCRIPTION: **NORTHEAST OF WHITTIER COLLEGE, RESIDENTIAL AREA, ADJACENT TO CEMETERY.**

LOCATION: **PLATE 55, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The California Canyon site is located northeast of the Whittier City limits, south of Turnbull Canyon Road. This site is located in the western portion of the Puente Hills.

Evaluation and Conclusion

California Canyon is located immediately east of the Whittier City limits, south of Turnbull Canyon Road. This west-facing canyon contains a blue line stream and is a pocket of open space in an otherwise developed hillside area. A review of the aerial photograph (Plate 55, Photo Appendix) and the Whittier Quadrangle resulted in identifying the following deficiency codes: U1, U2, U3, U4, U5 and C2 and C4. Large single family homes are situated along the northern and eastern ridgelines of the canyon. It is not possible to isolate this canyon from regional landfilling operations or to mitigate these impacts on the surrounding residences. Another onsite deficiency is the open space designation in the Los Angeles County General Plan which would be eliminated by by developing a regional landfill at this location (U5 and C4).

Regional access to the site is obtained from the San Gabriel River Freeway about two miles west of the site. Access from the west along Mar Vista Street, by Friends Park, and a residential hillside local street system poses a major access deficiency (U4). Residential uses and Whittier College are located at the mouth of the canyon and landfilling operations could not be isolates from these land uses (U1, U2 and U3). Based on these critical deficiencies, California Canyon was eliminated from further consideration as a regional landfill site.

*30.	**SITE NAME:**	**CRENSHAW BOULEVARD**
	USGS QUADRANGLE:	**TORRANCE, T4S R14W SECTION 35 NW1/4**
	DESCRIPTION:	**OLD GRAVEL PITS, ACCESS VIA CRENSHAW BOULEVARD, RESIDENTIAL AND PARK/OPEN SPACE USES SURROUND SITE.**
	LOCATION:	**PLATE 73, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Crenshaw Boulevard site is situated in Rolling Hills Estates, south of the City of Torrance. It consists of a large open space and old gravel pits located between Hawthorne and Crenshaw at the edge of the hills.

Evaluation and Conclusion

The Crenshaw Boulevard site is situated in Rolling Hills Estates and was once used for extraction of sand and gravel. The site is currently designated as the South Coast Park site. A review of the aerial photograph (Plate 73, Photo Appendix) and the Torrance Quadrangle resulted in identifying the following deficiency codes: S5, U1, U2, U3, U4, U5 and C3. This site is a large open space area that was once used for the extraction of sand and gravel. The site is currently designated as the South Coast Park site. Adjacent improved uses include a golf course, and the South Coast Botanic Garden. The Palos Verde Hills are to the southwest which would have an uninterrupted view of site landfill activities. Residential uses surround the site, except for those uses fronting the major arterial roadway network which creates major deficiencies (U1, U2, U3 and U5). Previous use of the site was mining for sand and gravel resources, and cover materials would likely have to be imported due to the nature of on-site alluvium (S5).

Regional freeway access to the site is from the Harbor Freeway (110), approximately 7 miles east. Crenshaw Boulevard provides for arterial access from the freeway. Other arterials which access the site include Palos Verde Drive to the south, and Hawthorne Blvd to the north. These arterial access roads are developed with commercial uses which carry high volumes of traffic with numerous traffic control devices (U4). Based on these critical deficiencies, the Crenshaw Boulevard site was eliminated from further consideration as a regional landfill site.

*31 SITE NAME: OLD CANYON

USGS QUADRANGLE: EL MONTE, T2S R12W SECTION 16 N1/2

DESCRIPTION: ACCESS THROUGH RESIDENTIAL AREAS, EAST FACING SLOPES OF PUENTE HILLS IN HACIENDA HEIGHTS

LOCATION: PLATE 85, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

Old Canyon is located at the southern terminus of Seventh Avenue, a secondary roadway with an interchange on the Pomona Freeway in Hacienda Heights.

Evaluation and Conclusion

The Old Canyon site is located east of the existing Puente Hills Landfill on the northeastern edge of the Puente Hills. A review of the aerial photograph (Plate 73, Appendix E) and the El Monte Quadrangle resulted in identifying the following deficiency codes: U1, U2, U3, U4, U5 and C4. This east-facing canyon is designated as Open Space on the Los Angeles County General Plan and development as a regional landfill would result in the loss of this important open space area (C4 and U5). The access to the site is over approximately one mile of local road from the Pomona Freeway. This road passes through a single family residential neighborhood and by a middle school which is located less than 1/8 mile from the entrance to the canyon (U4). It would not be possible to isolate a regional landfill from the surrounding urban uses which results in other critical deficiencies (U1, U2, and U3). Based on these critical deficiencies, the Old Canyon site was eliminated from further consideration as a regional landfill site.

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★32. SITE NAME: **ARROYO PESCADERO**

USGS QUADRANGLE: **LA HABRA, T2S R11W SECTION 25 NE1/4**

DESCRIPTION: **WEST FACING CANYON IN PUENTE HILLS, LA HABRA HEIGHTS WITH ACCESS FROM COLIMA ROAD**

LOCATION: **PLATE 85, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Arroyo Pescadero site is located in the Puente Hills between the cities of La Habra Heights and Whittier, east of Colima Road.

Evaluation and Conclusion

The Arroyo Pescadero site is located in a rapidly urbanizing portion of the Puente Hills about five miles south of the 60 Freeway. This west-facing canyon supports a blue line stream and is a pocket of open space in an otherwise developed hillside area supporting residential uses. A review of the aerial photograph (Plate 85, Photo Appendix) and the La Habra Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U2, U3, U4, U5 and C4. Large single family homes are situated along the northern and eastern ridgelines, making the site clearly visible from all surrounding higher lands. It would not be possible to isolate a regional landfill at this location from the surrounding urban uses (U1, U2, and U3). The Los Angeles County General Plan has designated this area as Open Space and a regional landfill at this location would cause the loss of this locally important open space area (U5 and C4).

Regional access to the site is along Colima Road, County Highway N8, which intersects Hacienda Boulevard providing access to the Pomona Freeway about five miles to the north. Colima Road passes through an extensive residential hillside area as well as an elementary school and churches (U4). Based on these critical deficiencies, the Arroyo Pescadero site was eliminated from further consideration as a regional landfill site.

★33. **SITE NAME:** **VON TASSEL CANYON**

USGS QUADRANGLE: **AZUSA, T1N R10W SECTION 21 AND 17**

DESCRIPTION: **SMALL CANYON NORTH OF THE SAN GABRIEL RIVER IN DUARTE**

LOCATION: **PLATE 86, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Von Tassel Canyon site is located in the San Gabriel Mountain foothills, just east of Fish Canyon, the Sanitation Districts alternative site #95. The northern part of the canyon is located within the Angeles National Forest boundary.

Evaluation and Conclusion

The Von Tassel Canyon site is a southeast-facing canyon of the San Gabriel Mountains, sited partially in north city limits of Azusa and Angeles National Forest lands. A review of the aerial photograph (Plate 86, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following deficiency codes: U1, U2, U3, U4 and C2. Residences are located up to the mouth of the canyon where it exits the foothills and have direct visibility into the canyon. It would not be possible to isolate landfilling activities from these residential uses (U1, U2, and U3).

Regional freeway access is from the north terminus of the San Gabriel River Freeway (605) and the Foothill Freeway (210) with surface street access from Huntington Drive, or Royal Oaks drive, both east/west primary roadways which pass through predominantly multiple residential and incidental commercial uses. Encanto Parkway, a secondary road access, parallels west bank of the San Gabriel River to Fish Canyon (dirt) road which traverses the Von Tassel Canyon drainage. Residences occur all along this route and a regional landfill would substantially alter the traffic volumes and truck percentage in this neighborhood (U4). Debris basins and flood control facilities are located at the mouth of the canyon and the runoff from the canyon flows directly into the San Gabriel River, the largest stream in the San Gabriels which recharges the region's aquifers (C4). Based on these critical deficiencies, the Von Tassel Canyon site was eliminated from further consideration as a regional landfill site.

★34. **SITE NAME:** **TODD AVENUE**

USGS QUADRANGLE: **AZUSA, T1N R10W SECTION 28 E1/2**

DESCRIPTION: **EAST BANK OF SAN GABRIEL RIVER, IN AZUSA NORTH OF THE FOOTHILL FREEWAY**

LOCATION: **PLATE 86, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Todd Avenue site consists of active sand and gravel operations and open space located directly adjacent to the San Gabriel River in the City of Azusa.

Evaluation and Conclusion

The Todd Avenue site is composed of coarse alluvium consisting of sand, gravel, and cobble materials deposited by the San Gabriel River where it exits the San Gabriel Mountains. A review of the aerial photograph (Plate 86, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U1, U2, U3, U4 and U5. The site's coarse alluvium is not a suitable cover/fill material and as a geologic base for landfill uses, according to policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site. These are critical deficiencies S3 and S5. Use of this area for a regional landfill would displace the mining operations, designated as a Mineral Resource Zone (U5).

Immediately east of this site are single family homes and an associated country club golf course development. It would not be possible to isolate these areas from a regional landfill operation and this creates critical deficiencies U1, U2 and U3. Regional freeway access is provided by the Foothill Freeway, with arterial access San Gabriel Avenue to Foothill Boulevard and then to Todd Ave. This route passes about two miles through commercial, residential and industrial areas to the site creating conflicts with these uses (U4). Based on these critical deficiencies, the Todd Avenue site was eliminated from further consideration as a regional landfill site.

***35. SITE NAME:** IRWINDALE RACEWAY

USGS QUADRANGLE: AZUSA, T1N R10W SECTION 33 N1/2

DESCRIPTION: OLD RACEWAY SITE IN THE SAN GABRIEL RIVER FLOOD PLAIN IN THE CITY OF IRWINDALE

LOCATION: PLATE 86, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

<u>Site Summary</u>

The Irwindale Raceway site is located in an abandoned sand and gravel mining area on the east side of the San Gabriel River and directly north of the Foothill Freeway in the City of Irwindale.

<u>Evaluation and Conclusion</u>

The Irwindale Raceway Site is located alluvial deposits on the eastern edge of the Santa Fe Flood Control Basin. The Santa Fe Dam impounds water from the San Gabriel River for conservation and flood control purposes and as part of a regional recreation area. The Irwindale Raceway site is not directly linked to the flood control system and has no drainage structure inlets to allow San Gabriel River storm runoff onto the site. A review of the aerial photograph (Plate 86, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U5, and C2. The site does contain the same coarse alluvium consisting of sand, gravel, and cobble materials which are not a suitable cover/fill material for landfill uses, according to policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover resulting in further truck trips to the site. These are critical deficiencies S3, S5 and C2. Use of this area for a regional landfill would also displace future mining operations in an area designated as a Mineral Resource Zone (U5).

Access to the site would be feasible without major land use conflicts. Access from the Foothill Freeway to Irwindale Avenue and then too the site on Foothill would avoid all residential and commercial area. However, based on the critical deficiencies outlined above, the Irwindale Raceway site was eliminated from further consideration as a regional landfill site.

★36. SITE NAME:	**OLD SAN GABRIEL CANYON**
USGS QUADRANGLE:	**AZUSA, T1N R10W SECTION 23 NE 1/4**
DESCRIPTION:	**SAN GABRIEL RIVER CANYON, UPSTREAM OF THE GUAGING STATION IN GLENDORA**
LOCATION:	**PLATE 86, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

This site consists of the San Gabriel River canyon with its perennial stream, water storage facilities and State Highway 39, including portions within the Angeles National Forest boundary.

Evaluation and Conclusion

Old San Gabriel Canyon is located in the canyon bottom of the San Gabriel River, immediately adjacent to the floodway of the San Gabriel River. It is located approximately 2 miles upstream of the canyon where it exits the San Gabriel Mountains. A review of the aerial photograph (Plate 86, Photo Appendix) and the Azusa Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S1, S3, S5, U4, U5, and C1, C2, C3 and C4. This location was once a hard rock mining site which has been abandoned. The site also lacks sufficient cover materials of a suitable nature to allow mining. It would require displacement of the stream bed and recreational stream in the local area which is a major deficiency (C1, C2, C3 and C4, S2 and S5). The potential for direct contamination of the surface flows and groundwater resources of the region contributes to the unsuitability of this site.

Regional freeway access to the site is from the Foothill Freeway. An offramp provides direct access to State Highway 39 or San Gabriel Canyon Road which provides access into the Angels National Forest and recreation areas. The access route is lined with commercial and residential uses and disposal truck traffic would alter the traffic flows and patterns on this major access route to the mountains (U4). Based on these critical deficiencies, the Old San Gabriel Canyon site was eliminated from further consideration as a regional landfill site.

★37. SITE NAME: MULL CANYON

USGS QUADRANGLE: GLENDORA, T1N R9W SECTION 28 E1/2

DESCRIPTION: MULL CANYON IS THE CANYON WEST OF MORGAN CANYON (SITE #81 SANITATION DISTRICT) IN GLENDORA

LOCATION: PLATE 87, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Mull Canyon site is located in the San Gabriel Mountain foothills, east of Big Dalton Canyon, in the City of Glendora.

Evaluation and Conclusion

The Mull Canyon site is located north of the City of Glendora and tangent to the Forest Service boundary. Morgan Canyon, identified by the L.A. Sanitation District as alternative #81, is directly west of the Mull Canyon site. A review of the aerial photograph (Plate 87, Photo Appendix) and the Glendora Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U2, U3, U4, and U5. Residential uses occur at the entrance to the canyon and along the ridge to the west and east. The residential uses along the ridge would be displaced in order to develop a landfill at this location. A regional landfill at this location could not be isolated and the impacts of operating the landfill on the surrounding residential uses could not be mitigated to an adequate level (U1, U2, U3 and U5).

Regional access to the site is from the Foothill Freeway, with Lone Hill Avenue, a north/south primary arterial served by freeway offramps, leading north to Mull Motorway which provides vehicular access to the site. The Glendora Country Club and residential neighborhoods occur along this 1.5 mile long access route. Traffic to the landfill would conflict with the uses along Lone Hill Avenue (U4). Based on these critical deficiencies, the Mull Canyon site was eliminated from further consideration as a regional landfill site.

***38. SITE NAME:** **CABLE AIRPORT QUARRY**

USGS QUADRANGLE: **ONTARIO, T1S R8W SECTION 2**

DESCRIPTION: **ABANDONED GRAVEL PIT FLANKS HISTORIC CHANNEL OF THE SAN ANTONIO CREEK, NORTH OF CABLE AIRPORT IN CLAREMONT**

LOCATION: **PLATE 91, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Cable Airport Quarry site is located in the San Antonio Creek flood plain north of Cable Airport just west of the Los Angeles and San Bernardino County boundary in the City of Claremont.

Evaluation and Conclusion

The Cable Airport Quarry site is situated on the San Antonio Wash alluvial fan derived from Mt. Baldy region of the San Gabriel Mountains. Cable Airport, a private small aircraft facility is immediately south of the project site. A residential condominium project exists along Padua Ave, immediately west of the site. A review of the aerial photograph (Plate 91, Photo Appendix) and the Ontario Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U1, U2, U3, U4 and U5. The site's coarse alluvium is not a suitable cover/fill material or as a geologic base for landfill uses, according to policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site. These are critical deficiencies S3 and S5. Use of this area for a regional landfill would displace the mining operations, designated a Mineral Resource Zone (U5).

Regional freeway access is provided via the San Bernardino Freeway (I-10) which is approximately 4-5 miles south of this site. Access from Indian Hill Boulevard, a primary roadway leading from the freeway to Padua Avenue which fronts the western boundary of the site. This access route passes through residential, incidental commercial uses and past three of the Claremont Colleges; Pomona College, Claremont McKenna College and Pitzer College. Refuse trucks using this access route would cause major conflicts with surrounding uses (U4). The adjacent residential and airport uses cannot be isolated nor the landfill operation impacts on these residences or the airport mitigated (U1, U2 and U3). Based on these critical deficiencies, the Cable Airport Quarry site was eliminated from further consideration as a regional landfill site.

***39. SITE NAME:** **CLAREMONT PIT**

USGS QUADRANGLE: **ONTARIO, T1S R8W SECTION 11**

DESCRIPTION: **ABANDONED QUARRY LOCATED BETWEEN FOOTHILL BOULEVARD AND ARROW HIGHWAY ADJACENT TO HISTORIC SAN ANTONIO CREEK DRAINAGE**

LOCATION: **PLATE 91, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Claremont Pit site is located in the San Antonio Creek flood plain immediately east of the Claremont colleges. The site is located in Claremont but overlaps into San Bernardino County.

Evaluation and Conclusion

The Claremont Pit site is situated on the San Antonio Wash alluvial fan derived from Mt. Baldy region of the San Gabriel Mountains. The Claremont Colleges are located immediately west of the site. A review of the aerial photograph (Plate 91, Photo Appendix) and the Ontario Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U1, U2, U3, U4 and U5. The site's coarse alluvium is not a suitable cover/fill material or as a geologic base for landfill uses, according to policy adopted by the Regional Water Quality Control Board. Use of this location would necessitate importing appropriate cover, resulting in further truck trips to the site. These are critical deficiencies S3 and S5. Use of this area for a regional landfill would displace the future mining potential at this location which is designated a Mineral Resource Zone (U5).

Regional freeway access is provided via the San Bernardino Freeway (I-10) which is approximately 4-5 miles south of this site. Access from Indian Hills Boulevard, a primary roadway leading from the freeway to Arrow Highway and Claremont Boulevard which fronts the western boundary of the site. This access route passes through residential, incidental commercial uses and past three of the Claremont Colleges; Pomona College, Claremont McKenna College and Pitzer College. Refuse trucks using this access route would cause major conflicts with surrounding uses (U4). The adjacent residential uses cannot be isolated nor the landfill operation impacts on these residences mitigated (U1, U2, and U3). Based on these critical deficiencies, the Claremont Pit site was eliminated from further consideration as a regional landfill site.

★40.	SITE NAME:	EAST SAN JOSE CREEK
	USGS QUADRANGLE:	SAN DIMAS, T2S R9W SECTION 9 W1/2
	DESCRIPTION:	ALONG THE HISTORIC FLOOD PLAIN OF SAN JOSE CREEK IN THE CITY OF INDUSTRY. WEST OF SANITATION DISTRICTS SITE #78
	LOCATION:	PLATES 93 AND 97, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The East San Jose Creek site is located in a rapidly urbanizing area in the San Jose Creek flood plain in the City of Industry.

Evaluation and Conclusion

The East San Jose Creek site is located along a wide canyon bottom on the south side of the San Jose Hills, within the City of Industry. This canyon bottom is the old San Jose Creek flood plain which separates the cities of Diamond Bar and Walnut adjacent to Old Brea Canyon Road. A review of the aerial photograph (Plates 93 and 97, Photo Appendix) and the San Dimas Quadrangle resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U1, U2, U3 and U4. The site is located on flood plain deposits deposited by San Jose Creek. The site's coarse alluvium is not a suitable geologic base for a regional landfill, according to policy adopted by the Regional Water Quality Control Board. This site has critical deficiencies S3 and S5.

Regional freeway access is provided by the Pomona Freeway (60). Old Brea Canyon Road is a major arterial leading from the freeway across the San Jose Creek towards the City of Walnut. This road passes through residential areas that would conflict with use of this route as the main access to a regional landfill. The canyon bottom is also is surrounding by gentle hillsides which support extensive residential uses which would have unobstructed views of the project and which could not be isolated from landfill operational impacts (U1, U2, U3, U4). Based on these critical deficiencies, the East San Jose Creek site was eliminated from further consideration as a regional landfill site.

★41. SITE NAME: PHILLIPS RANCH WEST

USGS QUADRANGLE: SAN DIMAS, T1S R9W SECTION 35 N1/2

DESCRIPTION: UNNAMED NORTHWEST FACING CANYON OF PUENTE HILLS WITH ACCESS FROM MISSION BOULEVARD. SITE IS OPPOSITE EAST FACING SLOPE OF SANITATION DISTRICTS SITE #77

LOCATION: PLATE 94, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Phillips Ranch West site is located just east of the Orange (57) Freeway between the San Bernardino and Pomona Freeways.

Evaluation and Conclusion

The Phillips Ranch West site is located southeast of the Spadra Landfill, south of Mission Boulevard. This northwest-facing canyon supports a blue line stream and currently is a pocket of open space in an otherwise developed hillside area supporting residential uses. A review of the aerial photograph (Plate 94, Photo Appendix) and the San Dimas Quadrangle resulted in identifying the following Urban Use deficiency codes: U1, U2, U3, U4, U5 and C4. Large single family homes are situated along the northern and eastern ridgelines, making the site clearly visible from all surrounding higher lands. The existing residential uses could not be isolated from a regional landfill operation at this site (U1, U2, and U3). The Los Angeles County General Plan has designated this area as Open Space and using this site as a landfill would displace the open space (U5 and C4).

Regional freeway access is available from the Orange Freeway (57) or the Corona Expressway, Highway 71 which lead to Mission Boulevard. Residences are located along the route to the site and regional landfill traffic would conflict with these uses (U4). Based on these critical deficiencies, the Phillips Ranch West site was eliminated from further consideration as a regional landfill site.

*42. **SITE NAME:**	**WEST MARSHALL CREEK**
USGS QUADRANGLE:	**GLENDORA, T1N R9W W1/2 SECTION 36**
DESCRIPTION:	**TRIBUTARY CHANNEL TO SAN DIMAS CANYON IN NORTHERN LA VERNE**
LOCATION:	**SEE PLATE 95A, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The West Marshall Creek site is located just east of the San Dimas Creek channel where it exits the San Gabriel Mountains. The majority of the canyon is located within the Angeles National Forest boundary.

Evaluation and Conclusion

The West Marshall Creek site is located mostly within the Angeles National Forest, north of the city of La Verne. A private archery park (Oak Tree) and Marshall Canyon County Park are located within the area encompassed by the canyon. A review of the aerial photograph (Plate 94, Photo Appendix) and the San Dimas Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U1, U2, U3, U4, U5 and C3. The parks would be displaced if a regional landfill were constructed (U5 and C3). Recently developed residential projects are located at the entrance to the canyon and it would not be possible to isolate a landfill from this developed area (U1, U2, U3).

Regional access is from the east terminus of the Foothill Freeway (210) to Wheeler Ave, a secondary roadway through residential areas, north to Golden Hills Road, which provides access to the Marshall Canyon Golf course. No public access currently exists to the site and disposal truck traffic would have to pass through the golf course up Marshall Canyon to access Angeles National Forest land, requiring further access improvements (U4). This site is the designated as part of Marshall Canyon County Park (C3) and its use could cause the loss of the park (U5). Based on these critical deficiencies, the West Marshall Creek site was eliminated from further consideration as a regional landfill site.

★43.	**SITE NAME:**	**EVEY CANYON**
	USGS QUADRANGLE:	**MT. BALDY, T1N R8W S1/2 SECTION 14**
	DESCRIPTION:	**A LARGE CANYON WITHIN FOREST SERVICE BOUNDARY, NORTH OF SAN ANTONIO DAM.**
	LOCATION:	**PLATE 96, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX**

Site Summary

The Evey Canyon site is a large canyon with substantial riparian habitat along the canyon bottom. The canyon is located just upstream of San Antonio Dam within the Angeles National Forest boundary.

Evaluation and Conclusion

The Evey Canyon site is located in San Antonio Creek canyon north of the cities of Claremont and Upland. San Antonio Dam, a major flood control facility, is located just downstream from the mouth of Evey Canyon. A review of the aerial photograph (Plate 96, Photo Appendix) and the Mt. Baldy Quadrangle resulted in identifying the following Urban Use and Conservation deficiency codes: U4, U5, C1, C2 and C4. Located within the Angeles National Forest boundary this site supports a blue line stream and the Los Angeles County General Plan designates this site as open space and an ecologically sensitive area (C1, C2 and C4). These conservation deficiencies are exacerbated by the location of the site directly adjacent San Antonio Creek and the dam which creates a major potential for groundwater contamination. Developing a regional landfill at this location would cause the conservation values to be lost or displaced (U5).

Regional freeway access is provided via the San Bernardino Freeway (I-10) which is approximately 10 miles south of this site. Indian Hills Blvd is the primary arterial leading from the I-10 freeway to Padua Avenue which becomes Mt. Baldy road at the toe of the San Gabriel Mountains. Road grades along Mt Baldy road, a two lane facility, increase sharply as the road reaches the top of San Antonio Dam before descending for a short distance where Evey Canyon intersects Mt. Baldy road (U4). The Claremont Colleges and residential neighborhoods occur along the haul route to Evey Canyon and would be impacted by traffic to a landfill (U4). Based on these critical deficiencies, the Evey Canyon site was eliminated from further consideration as a regional landfill site.

★44. SITE NAME: BUSINESS PARKWAY/SAN JOSE CREEK

USGS QUADRANGLE: SAN DIMAS, T2S R9W SECTION 9 W1/2

DESCRIPTION: A LARGE OPEN AREA ALONG SAN JOSE CREEK IN THE CITY OF INDUSTRY NORTH OF THE POMONA FREEWAY

LOCATION: PLATE 97, THOMAS GUIDE LOS ANGELES COUNTY AERIAL ATLAS, PHOTO APPENDIX

Site Summary

The Business Parkway/San Jose Creek site is located in a large open area along San Jose Creek just east of Fairway Drive and north of the Pomona Freeway in the City of Industry.

Evaluation and Conclusion

The Business Parkway/San Jose Creek site is a large open space in the middle of an industrial area. This canyon bottom contains San Jose Creek a blue line drainage channel located on the south side of the San Jose Hills, within the City of Industry. A review of the aerial photograph (Plate 97, Photo Appendix) resulted in identifying the following Service, Urban Use and Conservation deficiency codes: S3, S5, U1, U2, U3 and U4. The surrounding hillsides contain extensive residential development which would have unrestricted views of the landfill. These uses and adjacent light industrial facilities could not be isolated from the landfill operations and impacts (U1, U2 and U3).

Regional freeway access is provided by the Pomona Freeway (60). Fairway Drive is the primary arterial with direct freeway access leading to Business Parkway, a minor road, leading to the site. Land uses along the surface access routes are industrial and open space, with a node of commercial located at the Fairway Highway 60 interchange. Two continuation high schools are also located adjacent to access routes and the site (U4).

The site is also underlain by alluvial sediments which are not considered suitable for cover material or a geologic base for a landfill according to policy adopted by the Regional Water Quality Control Board (S3 and S5). Based on these critical deficiencies, the Business Parkway/San Jose Creek site was eliminated from further consideration as a regional landfill site.

MEMORANDUM

TO: Mr. Charlie McDonald
Ms. Pam Holt

FROM: Valerie Marshall

DATE: March 22, 1993

SUBJ: Screening Analysis for Mid-Range Sites

Enclosed for your files, please find the Screening Analysis of Alternative Landfill Sites Outside the Los Angeles Metropolitan Area (mid-range sites). If you have any questions, please call me at (310) 539-7150. Thank you.

cc: Les Senger

APPENDIX D

VNM1704b

Introduction

Six sites were identified within the mid-range area. A total of 146 alternative locations were evaluated as potential landfill sites within the Los Angeles metropolitan study area. Only five (5) alternative locations Blind Canyon, Towsley Canyon, Mission, Rustic and Sullivan Canyons appear to serve as viable alternatives to Elsmere Canyon.

Elsmere Canyon is located at the northern edge of the Los Angeles metropolitan study area. Chiquita Canyon, an active Class III Municipal Solid Waste Landfill, is located approximately 20 miles outside the Los Angeles metropolitan study area.

Because an active landfill is in operation outside the study area, a decision was made to expand the study area to evaluate remote disposal sites a reasonable distance beyond the Los Angeles metropolitan area, based on economic and environmental considerations.

The mid-range study area was determined by the location of Chiquita Canyon, haul distance, hauling costs, and air quality impacts. A "Hauling Analysis" was performed by EMCON Associates, which details the incremental economic and environmental impacts associated with remote landfill sites outside the Los Angeles metropolitan area.

Six sites were identified outside of the Los Angeles metropolitan area for consideration as potential alternative landfill sites to Elsmere Canyon. These mid-range sites were reviewed in order to evaluate the potential environmental impacts associated with disposal of waste from within the metropolitan area at more remote disposal sites outside the Los Angeles study area.

The six sites were selected based on a survey of canyons in the Santa Clara River valley with potential adequate capacity to meet disposal requirements for a regional landfill for approximately five years (assumed to be 10 million tons per year). The five year capacity criterion is specified in the Angeles National Forest, Land and Resource Management Plan. This screening effort produced six potential landfill locations (see Figure 2). The sites selected are Bear Canyon, Maher Canyon, Pole Canyon, Oak Spring Canyon, Mystic Canyon and Charlie Canyon.

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Los Angeles County Solid Waste Management Planning Criteria adopted by the County Board of Supervisors specify the County's objective to site new landfill capacity sufficient to meet the County's requirements for a period of fifty (50) years. The six canyons were also evaluated in regard to their suitability to meet the County's criteria as well as the Angeles National Forest Plan criteria. None of the six sites meet the Forest Plan requirement that the site "is part of the regional (countywide) solid waste disposal plan," because the County plan is currently only directed at sites within the Los Angeles metropolitan area.

In order to evaluate these six canyons for their potential suitability as a regional landfill, each site was subject to more detailed review using the Alternative Site Evaluation Criteria established by the Sanitation Districts of Los Angeles County and used to screen sites within the metropolitan area. A copy of the Criteria is provided as Table 1 to this evaluation. Each site was subject to a field evaluation, including a geological survey and a biological survey. The geological and biological surveys are attached to this document as Appendices A and B. Based on the data available from the field surveys, a screening review was conducted to determine whether the six sites contain any critical siting deficiencies that make them unacceptable for further evaluation as landfill sites. The findings for each site are presented on the following pages. The more detailed evaluation of each Evaluation Criteria Code is attached to this document as Appendix C.

The County Sanitation District's Alternative Site Evaluation Criteria Codes were developed to evaluate potential regional landfill sites located within the Los Angeles metropolitan area as shown in Figure 1. The focus of this alternative location screening review was to examine the suitability/feasibility of sites outside the metropolitan area based on site specific characteristics. The initial evaluations and conclusions regarding critical deficiencies are limited to site and area specific characteristics of each of the six locations. This approach allows each site to be considered initially on it's individual merits, not on generic critical deficiencies that apply to all sites outside the metropolitan area.

Based on the screening evaluation, it appears that the six potential regional landfill sites all have critical deficiencies and would be eliminated from further consideration.

TABLE 1

ALTERNATE SITE EVALUATION

TABLE 1:EVALUATION CRITERIA CODES

<u>SERVICE</u>- (DISPOSAL OPERATIONS SERVICE CRITERIA)

S

1. AQUIRABILITY - TIME TO AQUIRE AND COST OF AQUISITION
2. HAUL TIME - TYPICAL TIME TO HAUL TO THE SITE BY COLLECTION VEHICALS
3. GEOLOGY - GEOLOGIC FORMATIONS AND SEISMICITY WITH RESPECT TO CONTAINMENT AND DRAINAGE; AVAILABILITY OF OFF-SITE STORM DRAINS
4. ACCESS - OFF HIGHWAY HAUL ROUTE, CONSIDERING LENGTH, WIDTH, GRADE, AND CONSTRUCTION REQUIRED.
5. CAPACITY AND COVER - VOLUME AVAILABLE FOR DISPOSAL; ADEQUATE AREA FOR OPERATIONS; SUFFICIENT COVER SOIL.
6. PREPARATION - PREPARATION REQUIRED PRIOR TO DISPOSAL, CONSIDERING GRADING, BARRIERS, BERMS AND WATER SUPPLY.
7. ENERGY USE - BY COLLECTION VEHICLES AND ASSOCIATED DISPOSAL OPERATIONS.

<u>URBAN USES</u>- (ADJACENT URBAN USES CRITERIA)

U

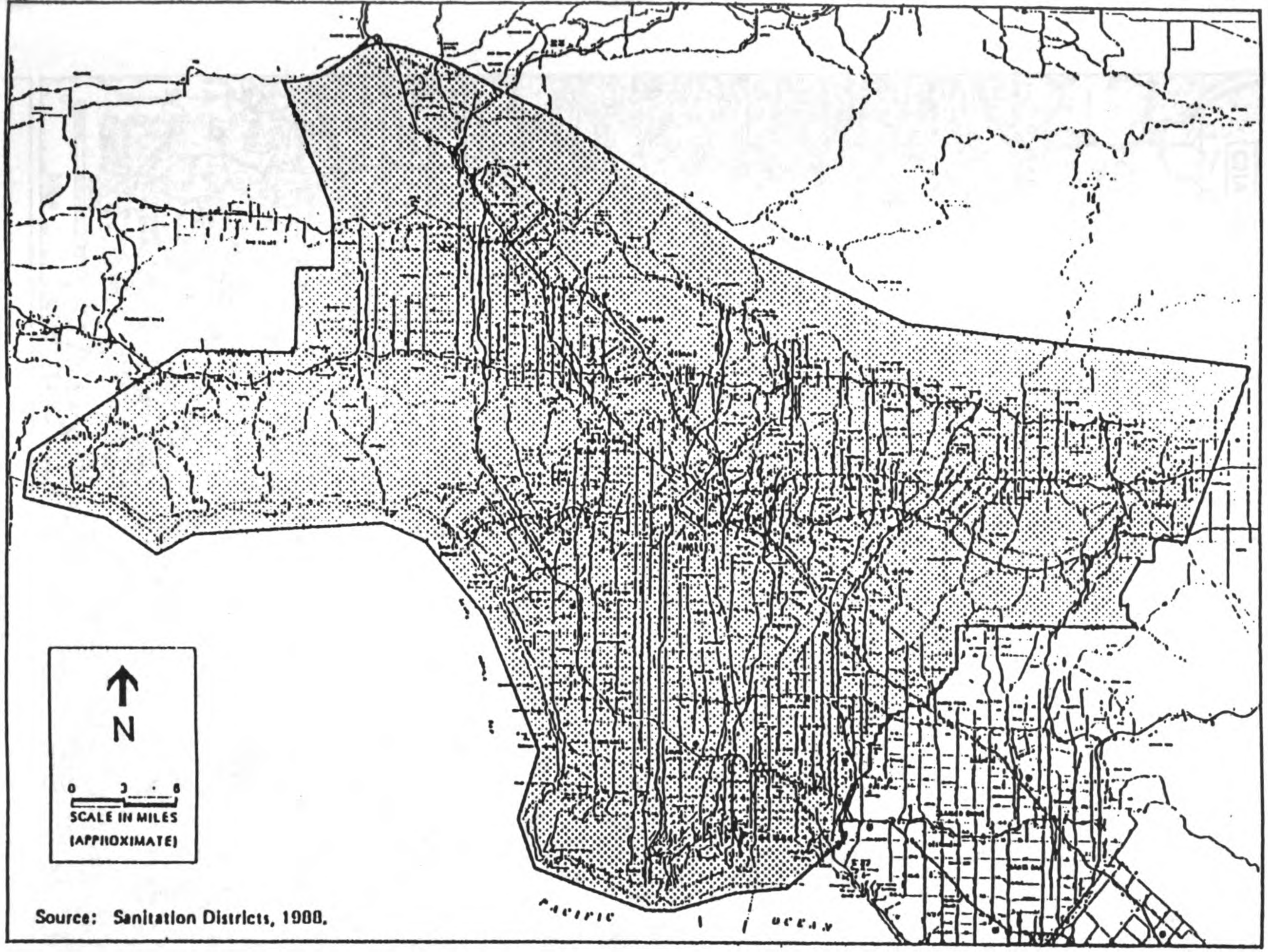
1. ISOLATION - FROM HOMES, SCHOOLS, CHURCHES, AND THE LIKE.
2. NEIGHBORHOOD - COMPATABILITY WITH ZONING, PLANNING, AND ADJACENT PROPERTY.
3. MITIGATIBILITY - OF ADVERSE IMPACTS (ODOR, METHANE GAS, VIEW DISTURBANCE, NOISE, VECTORS, DUST) ON ADJACENT URBAN USES.
4. TRAFFIC - IMPACT OF DISPOSAL OPERATIONS ON TRAFFIC FLOW ALONG STREETS AND FREEWAYS IN THE AREA.
5. USES DISPLACED - NUMBER AND COMMUNITY VALUE OF ANY IMPROVEMENTS ON THE SITE THAT LANDFILLING WOULD ELIMINATE.

<u>CONSERVATION</u>- (CONSERVATION AND END USE CRITERIA)

C

1. RESTORABILITY - AMENABILITY OF SITE TO RESTORATION FOR END USE; PRESERVING, RESTORING AND/OR BUFFERING HABITAT, WILDLIFE CORRIDORS, WATERSHED AND VIEWSHED.
2. ECOLOGY - COMPATIBILITY OF NATURAL VALUES IN THE AREA IN ITS PRESENT STATE WITH LANDFILLING, CONSIDERING EXISTING DISTURBANCE.
3. RECREATION - COMPATIBILITY OF OUTDOOR RECREATION ON THE SITE, AND IN THE REGION INCLUDING THE SITE, WITH LANDFILLING -- CONSIDERING ANY DIFFICULTY OF DEVELOPMENT FOR RECREATION THAT LANDFILLING MAY CREAT OR REMOVE.
4. OPEN SPACE PLANS - DEGREE OF COMPATIBILITY WITH REGULATIONS AND PLANS DESIGNED TO PRESERVE OPEN SPACE.
5. MATERIALS RECOVERY - CHARACTER AND LOCATION OF SITE WITH REGARD TO SUPPORTING MATERIALS RECOVERY FROM WASTE.
6. ENERGY EXTRACTION - CHARACTER AND LOCATION OF THE SITE WITH REGARD TO SUPPORTING ENERGY RECOVERY FROM WASTE.
7. AIR QUALITY - POLLUTION FROM COLLECTION VEHICLES AND ON-SITE EQUIPMENT.
8. ANTI-LITTER - CHARACTER AND LOCATION OF THE SITE WITH REGARD TO REDUCING LITTERING AND INDISCRIMINATE DUMPING.

APPENDIX D



Alternate Site Study Area

FIGURE 1

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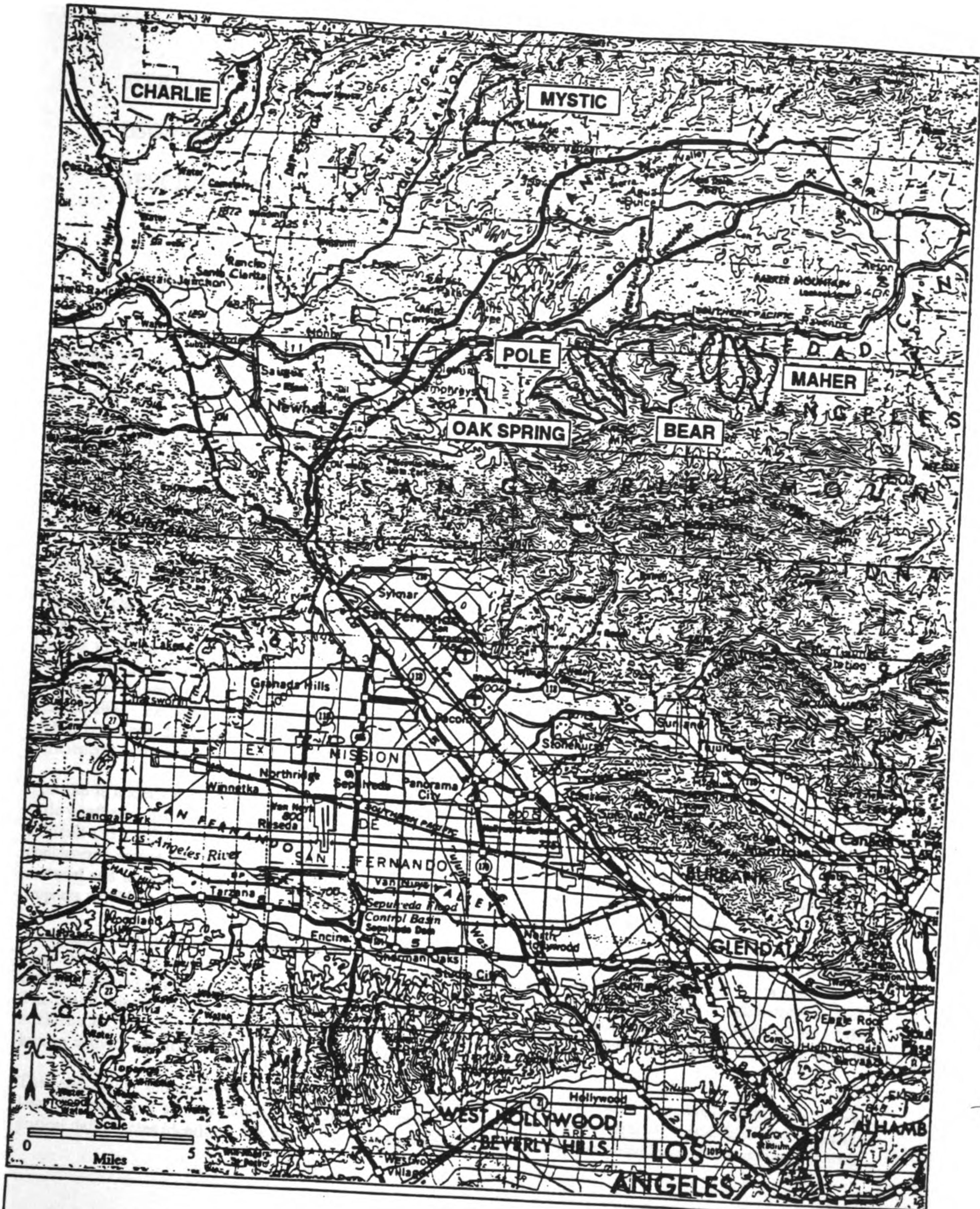

Figure 2

POTENTIAL ALTERNATIVE SITES

APPENDIX D

1.	**SITE NAME:**	**BEAR CANYON**
	USGS QUADRANGLE:	**AGUA DULCE**
	DESCRIPTION:	**RURAL LOCATION MOSTLY WITHIN THE ANGELES NATIONAL FOREST, STEEP NORTH FACING CANYON**
	LOCATION:	**SEE PAGE 188, 1989 LOS ANGELES COUNTY THOMAS GUIDE**

Site Summary

Bear Canyon is located approximately 45 miles north of downtown Los Angeles on the north slope of the San Gabriel Mountains. It consists of a canyon approximately four miles long that originates on the northwest slope of Magic Mountain and ends where it enters Soledad Canyon which contains the Santa Clara River. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north to State Highway 14; State Highway 14 northeast to the Soledad Canyon/Hwy. 14 interchange; and Soledad Canyon Road east about two miles. No road access exists to Bear Canyon which lies across the Santa Clara River from Soledad Canyon Road.

Evaluation and Conclusion

The Bear Canyon site is located in the Soledad Canyon portion of the Santa Clara River valley northeast of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Bear Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, several Evaluation Criteria Code critical deficiencies would occur if a regional landfill were constructed at the Bear Canyon site. The Service Code deficiencies identified are geology (S3), access (S4) and cover requirements (S5). Urban Use Code deficiencies identified are neighborhood (U2) and uses displaced (U5). The Conservation Code deficiencies identified are restorability and ecology (C1 and C2).

The site is underlain by crystalline bedrock and the canyon is very steep (a 1:1 slope ratio, 45°). There is very little weathered material on the slopes of the canyon which makes engineering and managing a landfill extremely difficult (S3). There is no current access to the Bear Canyon site and a major bridge/road would have to be constructed across the Santa Clara River to obtain access to the site (S4). Bear Canyon has little or no cover material and it would have to be imported from offsite at some unknown location (S5). Significant additional air impacts would be expected to be associated with the import of cover soil from another location (C7).

A regional landfill at the Bear Canyon site would potentially conflict with the County's Significant Ecological Area (SEA) designation which was established due to the presence of an endangered fish in the Santa Clara River downstream and adjacent to the site (unarmored threespine stickleback, *Gasterosteus aculeatus williamsoni*) (U2). The use of this canyon for a regional landfill has a high potential to damage and displace the critical habitat of the stickleback (U5), due to alterations or disturbances from surface runoff, silt build-up and the increased level of human activity resulting from site development and landfill operations.

The restorability and ecology issues are considered to exceed the critical deficiency thresholds because the potential loss of endangered species habitat is considered a permanent and unavoidable effect (C1 and C2). Based on the critical deficiencies identified, the Bear Canyon site was eliminated from further consideration as a regional landfill.

2.	SITE NAME:	MAHER CANYON (INDIAN/NELSON)
	USGS QUADRANGLE:	AGUA DULCE
	DESCRIPTION:	RURAL LOCATION MOSTLY WITHIN THE ANGELES NATIONAL FOREST, STEEP NORTH FACING CANYON(S)
	LOCATION:	SEE PAGE 188, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Maher Canyon is located approximately 48 miles north of downtown Los Angeles on the north slope of the San Gabriel Mountains. Maher Canyon refers to a set of three separate drainages: Maher, Nelson and Indian Canyons. These three drainages make up the Maher Canyon area; and each canyon opens on to the Soledad Canyon drainage. Maher Canyon is approximately three miles long and originates on the northeast slope of Magic Mountain and ends where it enters Soledad Canyon which contains the Santa Clara River. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north to State Highway 14; State Highway 14 northeast to the Soledad Canyon/Hwy. 14 interchange; and Soledad Canyon Road east about five miles. A short access road exists off of Soledad Canyon Road into Maher Canyon which enters County Detention Camp No. 1. A short road extends from Soledad Canyon Road west, into Nelson Canyon and a graded dirt road extends eastward up Indian Canyon to a small campground.

Evaluation and Conclusion

The Maher Canyon site is located in the Soledad Canyon portion of the Santa Clara River valley northeast of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Maher Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, several Evaluation Criteria Code critical deficiencies would occur if a regional landfill were constructed at the Maher Canyon site. The Service Code deficiencies identified are geology (S3) and cover requirements (S5). The Urban Use Code deficiencies identified are isolation (U1), neighborhood (U2), mitigability (U3), traffic (U4) and uses displaced (U5). The Conservation Code deficiencies identified are restorability and ecology (C1 and C2) and recreation (C3).

The site is underlain by crystalline bedrock and the canyon is very steep (a 1:1 slope ratio, 45°). There is very little weathered material on the slopes of the canyon which makes engineering and managing a landfill extremely difficult (S3). Maher Canyon has little or no cover material and it would have to be imported from offsite at some unknown location (S5).

A regional landfill at the Maher Canyon site would conflict with nearby surrounding recreational, residential and institutional uses located at the site or along the adjacent road (U1 and U4). Further, the site contains an existing County Sheriff's facility, County Detention Camp No. 1, which would be displaced by a proposed landfill at this location. The neighborhood designations for recreation, institutional uses and the County's Significant Ecological Area (SEA) designation, which was established due to the presence of an endangered fish in the Santa Clara River adjacent to the site (unarmored threespine stickleback, *Gasterosteus aculeatus williamsoni*), creates potential conflicts with landfill use in this area (U2). The use of this canyon for a regional landfill may have a potential to damage and displace the critical habitat of the stickleback (U5). The canyon is a tributary to the Santa Clara River, surface runoff from landfill development and operations could cause deterioration of water quality or reduction of the quantity of water reaching the river, and would likely result in significant adverse impacts to the species. Increased human activity from landfill operations would contribute to the disturbance of the critical habitat of the stickleback.

The restorability and ecology issues are considered to exceed the critical deficiency thresholds because the potential damage and/or loss of endangered species habitat is considered a permanent and unavoidable effect (C1 and C2). The Santa Clara River channel in the vicinity of Maher Canyon contains a number of recreation facilities that would have their use or value diminished as a result of the traffic associated with delivery of waste and cover material to a landfill at Maher Canyon (C3). Based on these critical deficiencies, the Maher Canyon site was eliminated from further consideration as a regional landfill.

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3.	SITE NAME:	POLE CANYON
	USGS QUADRANGLE:	AGUA DULCE
	DESCRIPTION:	RURAL LOCATION MOSTLY WITHIN THE ANGELES NATIONAL FOREST, STEEP NORTH FACING CANYON
	LOCATION:	SEE PAGE 125, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Pole Canyon is located approximately 45 miles north of downtown Los Angeles on the north slope of the San Gabriel Mountains. It consists of a canyon approximately three miles long that originates on the northwest slope of Magic Mountain and ends where it enters Soledad Canyon which contains the Santa Clara River. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north to State Highway 14; State Highway 14 northeast to the Soledad Canyon/Hwy. 14 interchange; Soledad Canyon Road for a few hundred yards east to Lang Station Road; and Lang Station Road east for about 1/2 mile to the mouth of the canyon. Road access exists into Pole Canyon for a short distance to some existing quarries.

Evaluation and Conclusion

The Pole Canyon site is located in the Soledad Canyon portion of the Santa Clara River valley northeast of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Pole Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, several Evaluation Criteria Code critical deficiencies would occur if a regional landfill were constructed at the Pole Canyon site. The Service Code deficiencies identified are geology (S3) and cover requirements (S5). The Urban Use Code deficiencies identified are neighborhood (U2) and uses displaced (U5). The Conservation Code deficiencies identified are restorability and ecology (C1 and C2).

The site is underlain by crystalline bedrock and the canyon is very steep (a 1:1 slope ratio, 45°). There is very little weathered material on the slopes of the canyon which makes engineering and managing a landfill extremely difficult (S3). Pole Canyon has little or no cover material and it would have to be imported from offsite at some unknown location (S5). Significant additional air impacts could be expected to be associated with the import of cover soil from another location (C7).

A regional landfill at the Pole Canyon site could conflict with the County's Significant Ecological Area (SEA) designation which was established due to the presence of an endangered fish in the Santa Clara River downstream and adjacent to the site (unarmored threespine stickleback, *Gasterosteus aculeatus williamsoni*) (U2). The use of this canyon for a regional landfill has a high potential to damage and displace the critical habitat of the stickleback (U5). Landfill operations and increased human activity could potentially impact the quality and quantity of water reaching the river, and potentially adversely impact the species. Additionally, extensive mining operations are located at the mouth of the canyon where it intersects the Santa Clara River. Using Pole Canyon as a regional landfill would displace some or all of these mining uses (U5).
The restorability and ecology issues are considered to exceed the deficiency thresholds because the potential loss of endangered species habitat is considered a permanent and unavoidable effect (C1 and C2). Based on these critical deficiencies, the Pole Canyon site was eliminated from further consideration as a regional landfill.

4. SITE NAME: OAK SPRING CANYON

USGS QUADRANGLES: AGUA DULCE/MINT CANYON

DESCRIPTION: RURAL LOCATION MOSTLY WITHIN THE ANGELES NATIONAL FOREST, STEEP WEST FACING CANYON

LOCATION: SEE PAGE 125, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Oak Spring Canyon is located approximately 45 miles north of downtown Los Angeles on the north slope of the San Gabriel Mountains. It differs from the previous three canyons, because it contains a substantial alluvial fan deposit (about two miles long) between the Santa Clara River and the point the canyon enters the San Gabriel Mountains. The Oak Spring Canyon site actually consists of one broad canyon approximately two miles long, west of the mountains, and two small canyons that originate on the western slope of Magic Mountain. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north to State Highway 14; State Highway 14 northeast to the Sand Canyon Road (Sand Canyon extends south to Tujunga along Interstate 210)/Hwy. 14 interchange; and Sand Canyon Road south to Lost Canyon Road and then to Oak Springs Canyon Road. Oak Springs Canyon Road is a graded road that eventually turns into a private road before it enters the San Gabriel Mountains. Alternatively, the mountain portion of Oak Springs Canyon can be reached by going Pole Canyon and reaching Oak Springs Canyon by traveling a dirt, graded road southwest for approximately 1.5-2 miles.

Evaluation and Conclusion

The Oak Spring Canyon site is located in the Santa Clara River valley east of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Oak Spring Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, several Evaluation Criteria Code critical deficiencies would occur if a regional landfill were constructed at the Oak Spring Canyon site. The Service Code deficiencies identified are geology (S3) and cover materials (S5). The Urban Use Code deficiencies identified are isolation (U1), neighborhood (U2), mitigability (U3), and traffic (U4). The Conservation Code deficiency identified is recreation (C3).

The upper portion of the Oak Spring Canyon site is underlain by crystalline bedrock and the canyon is very steep (a 1:1 slope ratio, 45°). There is very little weathered material on the slopes of the canyon which makes engineering and managing a landfill extremely difficult in this area (S3). The lower portion of the canyon has more moderate slopes, more weathered bedrock and more cover material (alluvium). Although upper Oak Spring Canyon has little or no cover material (S5), the lower portion of the Canyon appears to have adequate cover material. Landfilling the upper portion of the Canyon would require the importation of cover material. The alluvial material in the lower canyon may be mined and transported to the upper portion of the Canyon as part of the cover material required.

A regional landfill at the Oak Spring Canyon site would conflict with surrounding residential and recreational uses located in the lower canyon or directly adjacent to the canyon to the west (U1). A neighborhood conflict would be created due to the residential use designation in and around Oak Spring Canyon. These designations create conflicts with possible use of the canyon for a regional landfill (U2). The best access to Oak Springs Canyon would require 1,200+ disposal vehicles to pass through a residential community just east of the Santa

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Clara River on Sand Canyon Road (U4). The alternative access through Pole Canyon would require extensive and costly road improvements to permit all weather access. Therefore, use of the Sand Canyon Road access appears unavoidable. The use of either the upper or lower canyon for a regional landfill would require the local residential and recreational uses to be displace (U5), either directly for landfilling or as a source of cover material. Landfill operations, including traffic noise and dust, will affect nearby surrounding rural residential uses regardless of the access route selected (U3).

The lower portion of Oak Spring Canyon is used for extensive equestrian recreation activity that would either be eliminated or have its value diminished as a result of the landfilling activities and traffic associated with delivery of waste and cover material to a landfill at Oak Spring Canyon (C3). Based on these critical deficiencies, the Oak Springs Canyon site was eliminated from further consideration as a regional landfill.

5. SITE NAME: MYSTIC CANYON

USGS QUADRANGLES: MINT CANYON/GREEN VALLEY

DESCRIPTION: RURAL LOCATION MOSTLY WITHIN THE ANGELES NATIONAL FOREST, MODERATELY STEEP SOUTH FACING CANYON

LOCATION: SEE PAGE H, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Mystic Canyon is located approximately 50 miles north of downtown Los Angeles on a south facing slope of the Sierra-Pelona Mountains in the Angeles National Forest. It differs from the previous four canyons Bear, Maher, Pole, and Oak Spring Canyons because it is not as steep a canyon and is partially underlain by the Vasquez Formation and pelona schist, instead of the crystalline bedrock complex found in the San Gabriel Mountains. Mystic Canyon is a small canyon that intersects Texas Canyon which in turn intersects Bouquet Canyon. Bouquet Canyon is a major northeast trending canyon that intersects the Santa Clara River in the City of Santa Clarita. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north. The most direct route is to take I-5 to Magic Mountain Parkway; Magic Mountain Parkway to Valencia Boulevard; Valencia Boulevard to San Fernando Road; San Fernando Road to Bouquet Canyon Road; and Bouquet Canyon Road to Texas Canyon Road which leads to the entrance to Mystic Canyon. A less direct alternative route would be I-5 to Highway 14; Highway 14 to San Fernando Road; San Fernando Road to Bouquet Canyon road; and Bouquet Canyon Road to Texas Canyon Road which leads to the entrance to Mystic Canyon. All roads are paved, except Texas Canyon Road which is a graded and private road before it enters Mystic Canyon.

Evaluation and Conclusion

The Mystic Canyon site is located just east of Bouquet Canyon, north of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Mystic Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, several Evaluation Criteria Code critical deficiencies would occur if a regional landfill were constructed at the Mystic Canyon site. The Service Code deficiencies identified are geology (S3) and cover materials (S5) (upper portion only). The Urban Use Code deficiencies identified are isolation (U1), neighborhood (U2), mitigability (U3), and traffic (U4). The Conservation Code deficiency identified is recreation (C3).

The upper portion of the Mystic Canyon site is underlain by crystalline and Pelona Schist bedrock and the canyon walls are moderately steep (a 2:1 slope ratio). There is very little weathered material on the slopes of the upper canyon which makes engineering and managing a landfill difficult in this area (S3). The lower portion of the canyon has moderate slopes, bedrock is weathered to a greater depth (Vasquez Formation) and has potential to supply some cover material. Upper Mystic Canyon has little or no cover material and the volume of material in the lower portion of the canyon appears to be inadequate to meet the long-term cover needs for a regional landfill. Landfilling Mystic Canyon would appear to require cover material to be mined and transported from the lower portion of the canyon and another location in the future (S5).

A regional landfill at the Mystic Canyon site would cause a severe traffic conflict with the access roads and residential and commercial uses along these access roads. Local roads must be used for more than eight miles to reach the site and would require traversing intersections that already experience unacceptable levels of service during peak hour traffic periods. These roads are lined with commercial, residential, educational and institutional uses that would experience significant impacts from the 1,200+ disposal vehicles traveling local roads to the canyon (U4). The site itself is located in a rural residential area with extensive equestrian recreational uses located adjacent to and in the lower canyon (U1). The planning designations for rural residential uses in the vicinity of Mystic creates conflicts with a future regional landfill in the area (U2). Landfill operations could not be isolated from surrounding residential uses and impacts of landfill operations could not be fully mitigated at this location (U1 and U3).

The lower portion of Mystic Canyon is used for extensive equestrian recreation activity that would either be eliminated or have its value diminished as a result of the landfilling activities and traffic associated with delivery of waste and cover material to a landfill at Mystic Canyon (C3). Based on these critical deficiencies, the Mystic Canyon site was eliminated from further consideration as a regional landfill.

6. SITE NAME: CHARLIE CANYON

USGS QUADRANGLES: WARM SPRINGS MOUNTAIN

DESCRIPTION: RURAL LOCATION PARTLY WITHIN THE ANGELES NATIONAL FOREST, SHALLOW, LARGE SOUTHWEST FACING CANYON

LOCATION: SEE PAGE H, 1989 LOS ANGELES COUNTY THOMAS GUIDE

Site Summary

Charlie Canyon is located approximately 50 miles north of downtown Los Angeles on a southwest facing slope just southeast of Castaic Lake. The northeastern half of the canyon is located within the Angeles National Forest boundary. Charlie Canyon contains the widest canyon floor of the six canyons surveyed but it rapidly closes and becomes a small, narrow canyon within the National Forest boundary. The lower portion of Charlie Canyon consists of County owned property that contains the Pitchess Honor Rancho. The upper portion of the canyon within the National Forest is cut primarily into sedimentary rocks. Charlie Canyon ends where it intersects the lower portion of Castaic Valley and Castaic Creek which subsequently flows into the Santa Clara River about three miles south. Access to the site from the Los Angeles metropolitan area would be obtained by driving Interstate 5 north to the I-5/Parker Road interchange located in the community of Castaic. From the offramp the landfill traffic would travel east a few hundred feet to Castaic Road; south on Castaic Road to Tapia Canyon Road and east on Tapia Canyon Road to Charlie Canyon Road. All roads are paved up to the entrance into Charlie Canyon which is a graded dirt road from that point into the canyon.

Evaluation and Conclusion

The Charlie Canyon site is located just east of I-5 and the community of Castaic, northwest of the City of Santa Clarita. Onsite field surveys were used to evaluate the suitability of this location as a regional landfill to serve the Los Angeles metropolitan area. Charlie Canyon was evaluated using the Alternative Site Evaluation Criteria established by the Los Angeles County Sanitation Districts. Based on the review, one Evaluation Criteria Code critical deficiency would occur if a regional landfill were constructed at the Charlie Canyon site. The Urban Use Code deficiency identified is uses displaced (U5). No site specific Service or Conservation Code deficiencies were identified.

The critical deficiency identified during the screening review process is the presence of an existing County use in part of the canyon. The site contains a large County custodial facility, the Pitchess Honor Rancho, which has housed prisoners for the County jail system for over thirty years. The existing facility is located on over 400 acres. The County recently received approval to expand the existing facility. Based on the critical deficiency identified, the Charlie Canyon site was eliminated from further consideration as a regional landfill.

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AIR QUALITY IMPACT ASSESSMENT

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AIR QUALITY IMPACT ASSESSMENT

INTRODUCTION

Air quality dispersion modeling was performed to characterize pollutant releases from the proposed project sources. Air pollutants evaluated in the analysis are carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and particulate matter less than 10 microns in diameter (PM_{10}). The description of local meteorological conditions and background (existing) air quality conditions are described in the main report Section 6.1. Emission calculations and methods used in the air dispersion modeling and modeling results are discussed in the following sections. The tables of emission calculations are the last section.

AIR QUALITY EMISSION CALCULATIONS METHODOLOGY

D.1 CONSTRUCTION

- Construction Equipment - active
  - idle
- Fugitive Dust
- Truck Transport

D.1.1 Construction Equipment (Includes Access Road, Disposal Area, Support/Recycling Facilities, Offramp and Pipeline)

Active

$$Emissions\left(\frac{lb}{day}\right) = EF \times qty \times \frac{hours}{day} \times HLF$$

where:

qty = Number of equipment units onsite
HLF = Percentage of rated horsepower to represent actual usage
EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993 Tables A9-8A and 8B.
$\frac{hours}{day}$ = Assumed worst-case day operation

Idle

$$Emissions\left(\frac{lb}{day}\right) = qty \times EF \times \frac{lb}{453.6\ g} \times \frac{5\ mi}{hr} \times \frac{20\ min}{day} \times \frac{hr}{60\ min}$$

where:

qty	=	Number of equipment units onsite
EF	=	Emission Factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L (assumes idle speed at 5 mph)

D.1.2 Fugitive Dust

Clearing and Grading

$$PM_{10}\ Emissions\left(\frac{lb}{day}\right) = EF \times Area$$

where:

EF	=	PM_{10} Emission Factor per SCAQMD CEQA Handbook, April 1993, Table A9-9
Area	=	Total project acres to be cleared and graded/estimated construction days

Dirt Pushing

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{hours}{day} \times qty$$

where:

EF	=	Emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-9
$\frac{hours}{day}$	=	Assumes worst-case day operation
qty	=	Number of equipment units onsite

Topsoil Removal

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{miles}{day} \times qty$$

where:

EF	=	Emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-9
$\frac{miles}{day}$	=	Assumed worst case miles traveled per day
qty	=	Number of equipment units onsite

Pipeline

$$PM_{10}\ Emissions\left(\frac{lb}{day}\right) = EF \times \frac{Volume\ of\ Dirt}{Construction\ Period} \times \frac{ConstructionPeriod}{days}$$

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where:

EF = PM_{10} Emission Factor per Shalini George of the SCAQMD, February 1993

$\frac{Volume\ of\ Dirt}{Construction\ Period}$ = Amount of dirt removed, backfilled, or stockpiled during construction of pipeline

$\frac{Construction\ Period}{days}$ = Number of days for pipeline construction

D.1.3 Truck Transport

Running Exhaust

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{lb}{453.6\ g} \times \frac{miles}{RT\text{-}veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L

$\frac{miles}{RT\text{-}veh}$ = Number of miles per roundtrip per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

Cold/Hot Starts

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day} \times \%$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4

$\frac{trips}{veh}$ = Average trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

% = Percent of cold starts or hot starts per trip

Hot Soak and Diurnal

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4

$\frac{trips}{veh}$ = Average trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

D.2 PROPOSED PROJECT OPERATIONS

- Landfill User Emissions
- Onsite Fugitive PM_{10} Roadway Emissions
- Employee Vehicle Emissions
- Operating Equipment Emissions
- Fugitive PM_{10} Disposal Operation Emissions
- Above Ground Fuel Storage Tank
- Underground Fuel Storage Tank
- Flare Emissions
- Fugitive Landfill Gas Emissions

D.2.1 Landfill User Emissions

Running Exhaust

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{lb}{453.6\ g} \times \frac{mile}{Rt\text{-}veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4, A9-5-K-4 and A9-5-L

$\frac{miles}{RT\text{-}veh}$ = Number of miles per round trip per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

Cold/Hot Starts

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day} \times \%$$

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where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-5-J-4 and A9-5-K-4

$\frac{trips}{veh}$ = Average trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

% = Percent of cold starts or hot starts per trip

Hot Soak and Diurnal

$$Emissions \left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4

$\frac{trips}{veh}$ = Average trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

Idle

$$Emissions \left(\frac{lb}{day}\right) = qty \times EF \times \frac{lb}{453.6\ g} \times \frac{5\ mi}{hr} \times \frac{20\ min}{day} \times \frac{hr}{60\ min}$$

where:

qty = Number of equipment units onsite

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L (assumes idle speed at 5 mph)

D.2.2 Onsite Fugitive PM_{10} Roadway Emissions

$$Emissions \left(\frac{lb}{day}\right) = EF \times \frac{mile}{RT} \times \frac{RT}{Veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-9, with effectiveness of dust control measures applied as indicated in the 12/20/93 letter to Connie Day of the SCAQMD.

$\frac{miles}{RT}$ = Average miles per round trip

$\frac{Rt}{vel}$ = Number of round trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

D.2.3 Employee Vehicle Emission (includes construction and facility operations)

Running Exhaust

$$Emissions \left(\frac{lb}{day}\right) = EF \times \frac{lb}{453.6\ g} \times \frac{miles}{RT{-}veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-5-J-4 and A9-5-L

$\frac{miles}{RT-veh}$ = Number of miles per roundtrip per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

Cold/Hot Starts

$$Emissions \left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day} \times \%$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4

$\frac{trips}{veh}$ = Average trips per vehicle

$\frac{veh}{day}$ = Number of vehicles per day

% = Percent of cold starts or hot starts per trip

Hot Soak and Diurnal

$$Emissions \left(\frac{lb}{day}\right) = EF \times \frac{trips}{veh} \times \frac{veh}{day}$$

where:

EF = Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4

$\frac{trips}{veh}$ = Average trips per vehicle

$$\frac{veh}{day} = \text{Number of vehicles per day}$$

D.2.4 Operating Equipment Emissions

Mobile Equipment

$$Emissions\left(\frac{lb}{day}\right) = EF \times qty \times \frac{hours}{day} \times HLF$$

where:

qty	=	Number of equipment units onsite
HLF	=	Percentage of rated horsepower to represent actual usage
EF	=	Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Tables A9-8A and 8B.
$\frac{hours}{day}$	=	Assumed worst-case day operation

Stationary Equipment

$$Emissions\left(\frac{lb}{day}\right) = EF \times qty \times HLF \times Hp \times \frac{hour}{day}$$

where:

EF	=	Emission factor of pollutant per SCAQMD CEQA Handbook, April 1993, Table A9-3-A
qty	=	Number of equipment units onsite
HLF	=	Percentage of rated horsepower to represent actual usage
Hp	=	Rated horsepower of equipment
$\frac{hours}{day}$	=	Assumed worst-case day operation

Material Handling

$$PM_{10}\ Emissions\left(\frac{lb}{day}\right) = EF \times \frac{tons}{hr} \times \frac{hour}{day} \times qty$$

where:

EF	=	Emission factor of PM_{10} per USEPA AP-42, Volume I 1985, Section 8.19.1-3, Table 8.19.1-1
$\frac{tons}{hour}$	=	Maximum tons of asphalt and concrete crushed per hour
$\frac{hour}{day}$	=	Assumed worst-case day operation
qty	=	Number of equipment units onsite

D.2.5 Fugitive PM_{10} Disposal Operation Emissions

<u>Wind erosion</u>

$$EF = \frac{3{,}400 \times \left(\frac{e}{50}\right) \times \left(\frac{s}{15}\right) \times \left(\frac{f}{25}\right)}{\left(\frac{PE}{50}\right)^2} \times (1 - c_1) \times (1 - c_2)$$

where:

EF	=	Emission factor for PM_{30} (assume worst-case $PM_{30} = PM_{10}$) per Puente Hills Waste Management Facilities Draft EIR, Technical Appendices, June 1992
PE	=	Precipitation/evaporation index per Puente Hills DEIR
e	=	Surface erodibility per Puente Hills DEIR
s	=	Silt content per SCAQMD CEQA Handbook April 1993, Table A9-9-E-1
f	=	% winds exceed 12 mph from 1991 SCAQMD Meteorological data for Newhall
c_1	=	PM_{10} fugitive dust control per SCAQMD CEQA Handbook, April 1993, Table A11-9-A
c_2	=	PM_{10} fugitive dust control per SCAQMD CEQA Handbook, April 1993, Table A11-9-A

$$Emissions \left(\frac{lb}{day}\right) = EF \times Acres$$

where:

EF	=	Emission factor for PM_{10}
Acres	=	Assumed worst-case area of exposed surface of landfill during the Phase III operations

<u>Dirt Pushing</u>

$$EF = \frac{0.45 \times G^{1.5}}{H^{1.4}} \times 2.2046 \times (1 - c_1) \times (1 - c_2)$$

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where:

EF = PM_{10} emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-9-F

G = Silt content per SCAQMD CEQA Handbook, April 1993, Table A9-9-F-1

H = Moisture content per SCAQMD CEQA Handbook, April 1993, Table A9-9-F-2

c_1, c_2 = PM_{10} fugitive dust control per SCAQMD CEQA Handbook, April 1993, Table A11-9-A

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{hours}{day} \times qty$$

where:

EF = PM_{10} emission factor

$\frac{hours}{day}$ = Assumed worst-case day operation

qty = Number of equipment units onsite

<u>Unpaved Roads</u>

$$EF = 2.1 \times \left(\frac{G}{12}\right) \times \left(\frac{H}{30}\right) \times \left(\frac{I}{3}\right)^{0.7} \times \left(\frac{J}{4}\right)^{0.5} \times \left(\frac{365 - K}{365}\right) \times (1 - c_1)$$

where:

EF = PM_{10} emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-9-D

G = Silt content per project specific information

H = Moisture content per SCAQMD CEQA Handbook, April 1993, Table A9-9-D-2

I = Mean vehicle weight per project specific information

J = Mean number of wheels per project specific information

K = Mean number of days of at least 0.01 inches of precipitation per SCAQMD CEQA Handbook, April 1993, Table A9-9-D-4

c_1 = PM_{10} fugitive dust control per equation 3-2 of "Control of Open Fugitive Dust Sources", EPA-450/3-88-008

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{miles}{day} \times qty$$

where:

EF = PM_{10} emission factor

$\frac{mile}{day}$ = Assumed worst-case miles traveled per day

qty = Number of equipment units onsite

Earth Moving

$$Emissions\left(\frac{lb}{day}\right) = EF \times \frac{miles}{day} \times qty \times (1 - c_1)$$

where:

EF	=	PM_{10} emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-9
$\frac{miles}{day}$	=	Assumed worst-case mile traveled per day
qty	=	Number of equipment units onsite
c_1	=	PM_{10} fugitive dust control per SCAQMD CEQA Handbook, April 1993, Table A11-9-A

D.2.6 Above Ground Fuel Storage Tank (Fixed Roof)

Breathing Losses

$$Emission\left(\frac{lb}{day}\right) = 0.0226 \times M_v \times \left(\frac{P}{Pa - P}\right)^{0.68} \times D^{1.73} \times H^{0.51} \times DT^{0.5} \times F_p \times C \times K_c \times (1 - eff)$$

where:

M_v	=	Vapor molecular weight
P	=	True vapor pressure
P_a	=	Atmospheric vapor pressure
D	=	Tank diameter
H	=	Vapor space height
DT	=	Diurnal temperature change
F_p	=	Paint factor
c	=	Adjustment factor for small tanks
K_c	=	Product factor
eff	=	Vapor recovery efficiency

Working Loss

$$Emissions\left(\frac{lb}{day}\right) = 2.40 \times 10^{-5} \times M_v \times P \times V \times N \times K_n \times K_c \times (1 - eff)$$

where:

M_v	=	Vapor molecular weight
P	=	True vapor pressure
V	=	Tank capacity
N	=	Number of turnovers
K_n	=	Turnover factor

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K_c	=	Product factor
eff	=	Vapor recovery efficiency

D.2.7 Underground Storage Tank

Filling, Breathing and Refueling Losses

$$Emissions\left(\frac{lb}{day}\right) = EF \times throughput \times \%ROC$$

where:

EF	=	TOC emission factor per SCAQMD CEQA Handbook, April 1993, Table A9-6
Throughput	=	Assumed worst-case daily fuel usage
%ROC	=	92.3% of TOC

D.2.8 Flare Emissions

$$Emissions\left(\frac{lb}{day}\right) = EF \times qty \times heat \times flow \times \frac{60\ min}{hr}$$

where:

EF	=	Emission factors of pollutant from personal communication with Jay Chen of the SCAQMD, 1992
qty	=	Number of equipment units onsite
heat	=	Heat content of landfill gas
flow	=	Maximum landfill gas flow rate

D.2.9 Fugitive Landfill Gas Emissions

$$Emission\left(\frac{lb}{day}\right) = LFG \times Density \times Fugitive \times \%ROC \times \frac{2000\ lb}{ton} \times \frac{yr}{365\ days}$$

where:

LFG	=	Landfill gas generated per worst-case year as predicted using the EPA's landfill Air Emissions Estimation Model version 1.1
Density	=	Density of landfill gas
Fugitive	=	% landfill gas not collected
%ROC	=	92.3% of TOC

AIR QUALITY MODELING METHODOLOGY

Air quality dispersion modeling was used to simulate the maximum impacts of transport from criteria pollutant emissions at the proposed Elsmere Landfill. The Integrated Gaussian Model (IGM) model was used in this analysis. IGM uses the algorithms contained in the EPA-approved Industrial Source Complex - Short Term (ISC2) and Complex I models. Both of these model algorithms are recommended by the EPA for analysis of air quality impacts, with the algorithms used in ISC2 suitable for estimating pollution concentrations in flat terrain and Complex I suitable for estimating concentrations in hilly or complex terrain.

The IGM model estimates the concentrations from both modeling algorithms and on a receptor by receptor basis determines the maximum concentration from both the two algorithms. The use of this model allows the user to more efficiently determine the maximum concentrations due to varying terrain regimes that surround the proposed ESWMF property.

The IGM model was used to estimate pollution concentrations from CO, NO_2, SO_2 and PM_{10} emissions. Pollutants will be emitted from the landfill gas flare, the fueling area, the wood/green waste processing facility, the asphalt/concrete facility and fugitive dust from the landfill operations and mobile sources traveling along paved and unpaved roads.

IGM I requires the input of source parameters which include source emissions, source locations (UTM Coordinates), source elevation, emission release height, inner stack diameter, gas exit temperature, gas exit velocity, area (for area sources) and initial vertical and lateral dimensions (for volume sources).

In summary a total of 1 point source, 12 area sources were modeled to represent emissions of CO, NO_2, SO_2, and PM_{10}. PM_{10} emissions from paved and unpaved roads were modeled as volume sources. A total of ten flares may be in operation during the final phase of the landfill. Due to their close proximity to one another, the flares have been co-located into one point source. Emissions from the fueling area were modeled as an area source located on the ancillary pad. Emissions from the wood/green waste processing facility, the asphalt/concrete facility, mobile sources on the landfill and fugitive dust were modeled as 11 area sources which would represent the final phase of the landfill footprint. Dust emissions from mobile sources traveling along the paved and unpaved roads were modeled as 79 volume sources which represent a line source.

Dispersion modeling was performed using source location and emissions which would occur during the final stage of the landfill representing worst-case impacts. A brief source description and the location (in UTM Coordinates) of each modeled source is summarized in Table B-1. Tables B-2, B-3 and B-4 identify each source and list source parameters used in the dispersion modeling. Overall project operational emissions of CO, NO_2, SO_2 and PM_{10} are summarized in Table B-5.

In order to more accurately represent the operations conditions at the proposed landfill site, dispersion modeling was conducted in two stages to simulate three separate operating shifts. Shift 1 is assumed to occur from midnight through 8:00 am, Shift 2 is assumed to occur from 8:00 am to 4:00 pm, and Shift 3 is assumed to operate from 4:00 pm to midnight completing the 24 hour per day operation. Based upon the proponent, the majority of the activities at the landfill will occur during the daytime shift (Shift 2) represented by higher emissions rates during this time period. Shifts 1 and 3 are expected to have the same operations and emission characteristics, with minimal emission activities.

The "split-shift" atmospheric dispersion modeling was accomplished by separating the hourly meteorological data into two input data-sets; one containing the weather observations occurring during the off-shifts (Shifts 1 and 3) and the other data-set containing the meteorological data for the hours associated with Shift 2 operations.

Receptors (locations where pollution concentrations are calculated) were located at 100 meter increments along the property boundary. Receptors were also located at 500 meter increments extending from the property boundary to a distance of approximately 2 kilometers. Receptor elevations receptors were taken from USGS maps.

The terrain within the modeling region is characterized as complex, experiencing elevations that are both above and below the height of the terrain at the proposed facility. Algorithms from the ISC2 model were used to model receptors with elevations lower than the height of the flare. For receptors with elevations higher than the flare but lower than the final plume centerline (intermediate terrain) algorithms from both ISC2 and COMPLEX I were used; calculated concentrations were compared for each hour of meteorological data and the greater of the two results were chosen for the analysis.[1] Receptors with elevations higher than the final plume centerline were modeled using algorithms from COMPLEX I.[1]

IGM requires the input of meteorological data which includes hourly average wind speed, wind direction, ambient temperature, stability class and mixing heights. The 1981 meteorological data used was supplied by the SCAQMD. The most representative data set for the proposed landfill was derived from Newhall wind data, Burbank surface data and Ontario mixing height data. The combined surface and upper air data were formatted to be compatible with the IGM model.

Class I Impacts

Atmospheric dispersion modeling was also performed to estimate the maximum Class I impacts of NO_2 and PM_{10} which may occur at the closest Class I area, the San Gabriel Wilderness. The IGM model was used to calculate maximum NO_x concentration inside the Wilderness. Due to the relative large distance between the proposed site and the San Gabriel Wilderness (approximately 23 miles), PM_{10} modeling was conducted using the Fugitive Dust Model (FDM) to account for particle deposition from the plume. The FDM model was specifically designed to simulate dispersion of particulate plumes from a wide variety of fugitive sources and includes a particle deposition scheme that accounts for particle fallout and gravitational settling. FDM has been thoroughly reviewed by the EPA and has been placed on the EPA recommended list for approval.

[1]Please note that COMPLEX I cannot simulate releases from area sources or volume sources, therefore, results from the ISC2 model were calculated and used.

Similar to the IGM model, FDM accepts point and area sources as inputs into the model. In addition, FDM allows for sources such as roads to be modeled as line sources.

AIR QUALITY MODELING RESULTS

Modeling results were compared to applicable state and federal ambient air quality standards. This comparison was performed to estimate the significance of the proposed project impacts. Modeled impacts were added to worst-case background levels and compared to applicable National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). These results are summarized in Table B-6. A brief discussion of the results follows.

Carbon Monoxide (CO)

Background concentrations in the project area exceed the 8-hour NAAQS and CAAQS. The maximum predicted 8-hour CO concentration is 91 $\mu g/m^3$. When the maximum background 1-hour concentration of 22,038 $\mu g/m^3$ is added to the predicted maximum 1-hour concentrations of 281 $\mu g/m^3$, a resulting concentration of 22,319 $\mu g/m^3$ is below the 1-hour CAAQS.

Nitrogen Oxides

Existing background concentrations in the project area do not exceed the 1-hour CAAQS or the annual NAAQS for NO_2.

The maximum modeled 1-hour concentration of NO_x was 88 $\mu g/m^3$, resulting in a maximum predicted ambient NO_2 concentration of 450 $\mu g/m^3$ (88 $\mu g/m^3$ + 362 $\mu g/m^3$ background). This is below the 1-hour NO_2 CAAQS of 470 $\mu g/m^3$. Predicted 1-hour concentrations of NO_2 are demonstrated graphically in Figure B-1.

The maximum annual predicted concentrations of NO_x was 15 $\mu g/m^3$. When this concentration is added to the maximum background level of 76 ug/m^3, the resultant annual average ambient concentration is below the annual average NO_2 NAAQS (100 $\mu g/m^3$). No significant impacts from NO_2 emissions are expected from the proposed project.

Sulfur Dioxide

Background concentrations of ambient SO_2 are well below both the NAAQS and the CAAQS. When model predicted concentrations of SO_2 are combined with existing background levels, concentrations fall below both the NAAQS and the CAAQS for all averaging periods (1-hour, 2-hour, 24-hour and annual). No significant impacts from SO_2 emissions are expected from the proposed project.

Particulate Matter Less than 10 Microns in Diameter

The background concentrations of PM_{10} exceed the 24-hour CAAQS and the annual CAAQS and NAAQS. Maximum modeled impacts of PM_{10} estimate a 24-hour concentration of 85 ug/m^3 and an annual concentration of 16 ug/m^3. The predicted 24-hour concentrations of

PM_{10}, when added to existing background levels would cause an exceedance of the 24-hour NAAQS. However, concentrations of PM_{10} decrease quickly with distance from the property boundaries. Figures B-2 and B-3 illustrate graphically the predicted 24-hour and annual PM_{10} concentrations, respectively.

Conclusion

As illustrated in Table B-6, background levels of CO exceed the 8-hour NAAQS and CAAQS and that existing PM_{10} levels exceed the annual NAAQS and CAAQS, as well as the 24-hour CAAQS. When modeled predictions were added to background pollution concentrations, for the remainder of pollutants and averaging times, no new exceedences are predicted. However, impacts from the project, where the background values exceed the standards, are estimated to be very localized (Figures B-1 and B-2), and it is not anticipated that proposed project will significantly the impact populated areas.

Class I Impacts

The maximum predicted 24-hour NO_2 and PM_{10} concentrations are 0.5 $\mu g/m^3$ and 0.4 $\mu g/m^3$, respectively. These values are below the 1.0 $\mu g/m^3$ National Forest Services significant criteria and, therefore, are not projected to cause a significant impact in the San Gabriel Wilderness.

APPENDIX D

APPENDIX F

TABLE D-1
(page 1 of 2)
SOURCE IDENTIFICATION AND LOCATIONS

Modeling ID No.	Source Description	UTM COORDINATES (x) East (meters)	UTM COORDINATES (y) North (meters)	SOURCE TYPE
1	Flare	364960	3802066	Point
2	Fueling Area	362878	3801610	Area
3	Mobile Sources – Area Source #1	364125	3802000	Area
4	Mobile Sources – Area Source #2	364125	3801625	Area
5	Mobile Sources – Area Source #3	364500	3801875	Area
6	Mobile Sources – Area Source #4	363750	3801250	Area
7	Mobile Sources – Area Source #5	364125	3801250	Area
8	Mobile Sources – Area Source #6	363500	3800875	Area
9	Mobile Sources – Area Source #7	363875	3801000	Area
10	Mobile Sources – Area Source #8	363375	3800875	Area
11	Mobile Sources – Area Source #9	363250	3800750	Area
12	Mobile Sources – Area Source #10	363375	3800750	Area
13	Mobile Sources – Area Source #11	363500	3800675	Area
14	Mobile Sources – Volume Source #1	361761	3802102	Volume
15	Mobile Sources – Volume Source #2	361769	3802193	Volume
16	Mobile Sources – Volume Source #3	361762	3802276	Volume
17	Mobile Sources – Volume Source #4	361745	3802361	Volume
18	Mobile Sources – Volume Source #5	361726	3802442	Volume
19	Mobile Sources – Volume Source #6	361712	3802507	Volume
20	Mobile Sources – Volume Source #7	361710	3802567	Volume
21	Mobile Sources – Volume Source #8	361753	3802624	Volume
22	Mobile Sources – Volume Source #9	361809	3802637	Volume
23	Mobile Sources – Volume Source #10	361859	3802618	Volume
24	Mobile Sources – Volume Source #11	361894	3802568	Volume
25	Mobile Sources – Volume Source #12	361898	3802485	Volume
26	Mobile Sources – Volume Source #13	361903	3802400	Volume
27	Mobile Sources – Volume Source #14	361918	3802337	Volume
28	Mobile Sources – Volume Source #15	361943	3802276	Volume
29	Mobile Sources – Volume Source #16	361974	3802200	Volume
30	Mobile Sources – Volume Source #17	362007	3802118	Volume
31	Mobile Sources – Volume Source #18	362036	3802050	Volume
32	Mobile Sources – Volume Source #19	362068	3801970	Volume
33	Mobile Sources – Volume Source #20	362100	3801896	Volume
34	Mobile Sources – Volume Source #21	362143	3801830	Volume
35	Mobile Sources – Volume Source #22	362209	3801776	Volume
36	Mobile Sources – Volume Source #23	362283	3801751	Volume
37	Mobile Sources – Volume Source #24	362376	3801752	Volume
38	Mobile Sources – Volume Source #25	362453	3801760	Volume
39	Mobile Sources – Volume Source #26	362546	3801773	Volume
40	Mobile Sources – Volume Source #27	362621	3801782	Volume
41	Mobile Sources – Volume Source #28	362710	3801794	Volume
42	Mobile Sources – Volume Source #29	362793	3801803	Volume
43	Mobile Sources – Volume Source #30	362871	3801814	Volume
44	Mobile Sources – Volume Source #31	362953	3801821	Volume
45	Mobile Sources – Volume Source #32	362995	3801903	Volume

APPENDIX E

TABLE D-1
(page 2 of 2)
SOURCE IDENTIFICATION AND LOCATIONS

Modeling ID No.	Source Description	UTM COORDINATES (x) East (meters)	UTM COORDINATES (y) North (meters)	SOURCE TYPE
46	Mobile Sources – Volume Source #33	363027	3801971	Volume
47	Mobile Sources – Volume Source #34	363090	3802027	Volume
48	Mobile Sources – Volume Source #35	363136	3802084	Volume
49	Mobile Sources – Volume Source #36	363167	3802155	Volume
50	Mobile Sources – Volume Source #37	363206	3802232	Volume
51	Mobile Sources – Volume Source #38	363257	3802298	Volume
52	Mobile Sources – Volume Source #39	363301	3802367	Volume
53	Mobile Sources – Volume Source #40	363380	3802400	Volume
54	Mobile Sources – Volume Source #41	363457	3802397	Volume
55	Mobile Sources – Volume Source #42	363527	3802455	Volume
56	Mobile Sources – Volume Source #43	363586	3802506	Volume
57	Mobile Sources – Volume Source #44	363675	3802519	Volume
58	Mobile Sources – Volume Source #45	363756	3802510	Volume
59	Mobile Sources – Volume Source #46	363841	3802503	Volume
60	Mobile Sources – Volume Source #47	363924	3802498	Volume
61	Mobile Sources – Volume Source #48	364017	3802493	Volume
62	Mobile Sources – Volume Source #49	364097	3802483	Volume
63	Mobile Sources – Volume Source #50	364184	3802465	Volume
64	Mobile Sources – Volume Source #51	364258	3802449	Volume
65	Mobile Sources – Volume Source #52	364348	3802431	Volume
66	Mobile Sources – Volume Source #53	364383	3802389	Volume
67	Mobile Sources – Volume Source #54	364332	3802350	Volume
68	Mobile Sources – Volume Source #55	364255	3802343	Volume
69	Mobile Sources – Volume Source #56	364180	3802337	Volume
70	Mobile Sources – Volume Source #57	364097	3802329	Volume
71	Mobile Sources – Volume Source #58	364014	3802303	Volume
72	Mobile Sources – Volume Source #59	363940	3802283	Volume
73	Mobile Sources – Volume Source #60	363870	3802261	Volume
74	Mobile Sources – Volume Source #61	363792	3802232	Volume
75	Mobile Sources – Volume Source #62	363739	3802160	Volume
76	Mobile Sources – Volume Source #63	363699	3802098	Volume
77	Mobile Sources – Volume Source #64	363660	3802032	Volume
78	Mobile Sources – Volume Source #65	363654	3801941	Volume
79	Mobile Sources – Volume Source #66	363664	3801857	Volume
80	Mobile Sources – Volume Source #67	363673	3801774	Volume
81	Mobile Sources – Volume Source #68	363670	3801696	Volume
82	Mobile Sources – Volume Source #69	363660	3801611	Volume
83	Mobile Sources – Volume Source #70	363658	3801526	Volume
84	Mobile Sources – Volume Source #71	363643	3801447	Volume
85	Mobile Sources – Volume Source #72	363630	3801361	Volume
86	Mobile Sources – Volume Source #73	363661	3801288	Volume
87	Mobile Sources – Volume Source #74	363697	3801221	Volume
88	Mobile Sources – Volume Source #75	363731	3801153	Volume
89	Mobile Sources – Volume Source #76	363765	3801088	Volume
90	Mobile Sources – Volume Source #77	363815	3801037	Volume
91	Mobile Sources – Volume Source #78	363846	3801097	Volume
92	Mobile Sources – Volume Source #79	363875	3801166	Volume

TABLE D–2

POINT SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	Stack Height (meters)	Grade Elevation (feet)	Internal Diameter (meters)	Tempurature (Kelvin)	Exit Velocity (meters/second)
1	Flare	12.192	3121	2.44	1033.18	4.57

TABLE D-3

AREA SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	Grade Elevation (feet)	Length of Side (meters)	Area of Sources ($meters^2$)
2	Fueling Operations	1975	44.98	2023.20
3	Mobile Sources – Area Source #1	2650.00	375.00	140625.00
4	Mobile Sources – Area Source #2	3000.00	375.00	140625.00
5	Mobile Sources – Area Source #3	2825.00	375.00	140625.00
6	Mobile Sources – Area Source #4	2950.00	375.00	140625.00
7	Mobile Sources – Area Source #5	3000.00	375.00	140625.00
8	Mobile Sources – Area Source #6	2800.00	375.00	140625.00
9	Mobile Sources – Area Source #7	2850.00	250.00	62500.00
10	Mobile Sources – Area Source #8	2600.00	125.00	15625.00
11	Mobile Sources – Area Source #9	2400.00	125.00	15625.00
12	Mobile Sources – Area Source #10	2500.00	125.00	15625.00
13	Mobile Sources – Area Source #11	2700.00	250.00	62500.00

TABLE D-4
(page 1 of 2)
VOLUME SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	Grade Elevation (feet)	Initial Lateral Dimension (meters)	Vertical Dimension (meters)	Release Height (meters)
14	Mobile Sources – Volume Source #1	1641	37.8	1.395	1.5
15	Mobile Sources – Volume Source #2	1686	37.8	1.395	1.5
16	Mobile Sources – Volume Source #3	1645	37.8	1.395	1.5
17	Mobile Sources – Volume Source #4	1672	37.8	1.395	1.5
18	Mobile Sources – Volume Source #5	1655	37.8	1.395	1.5
19	Mobile Sources – Volume Source #6	1686	37.8	1.395	1.5
20	Mobile Sources – Volume Source #7	1666	37.8	1.395	1.5
21	Mobile Sources – Volume Source #8	1670	37.8	1.395	1.5
22	Mobile Sources – Volume Source #9	1735	37.8	1.395	1.5
23	Mobile Sources – Volume Source #10	1771	37.8	1.395	1.5
24	Mobile Sources – Volume Source #11	1813	37.8	1.395	1.5
25	Mobile Sources – Volume Source #12	1894	37.8	1.395	1.5
26	Mobile Sources – Volume Source #13	1850	37.8	1.395	1.5
27	Mobile Sources – Volume Source #14	1773	37.8	1.395	1.5
28	Mobile Sources – Volume Source #15	1737	37.8	1.395	1.5
29	Mobile Sources – Volume Source #16	1791	37.8	1.395	1.5
30	Mobile Sources – Volume Source #17	1899	37.8	1.395	1.5
31	Mobile Sources – Volume Source #18	1944	37.8	1.395	1.5
32	Mobile Sources – Volume Source #19	1944	37.8	1.395	1.5
33	Mobile Sources – Volume Source #20	1881	37.8	1.395	1.5
34	Mobile Sources – Volume Source #21	1920	37.8	1.395	1.5
35	Mobile Sources – Volume Source #22	2044	37.8	1.395	1.5
36	Mobile Sources – Volume Source #23	2063	37.8	1.395	1.5
37	Mobile Sources – Volume Source #24	1946	37.8	1.395	1.5
38	Mobile Sources – Volume Source #25	1917	37.8	1.395	1.5
39	Mobile Sources – Volume Source #26	1881	37.8	1.395	1.5
40	Mobile Sources – Volume Source #27	1852	37.8	1.395	1.5
41	Mobile Sources – Volume Source #28	1796	37.8	1.395	1.5
42	Mobile Sources – Volume Source #29	1781	37.8	1.395	1.5
43	Mobile Sources – Volume Source #30	1897	37.8	1.395	1.5
44	Mobile Sources – Volume Source #31	1918	37.8	1.395	1.5
45	Mobile Sources – Volume Source #32	1733	37.8	1.395	1.5

TABLE D-4
(page 2 of 2)
VOLUME SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	Grade Elevation (feet)	Initial Lateral Dimension (meters)	Vertical Dimension (meters)	Release Height (meters)
46	Mobile Sources – Volume Source #33	1685	37.8	1.395	1.5
47	Mobile Sources – Volume Source #34	1700	37.8	1.395	1.5
48	Mobile Sources – Volume Source #35	1740	37.8	1.395	1.5
49	Mobile Sources – Volume Source #36	1687	37.8	1.395	1.5
50	Mobile Sources – Volume Source #37	1747	37.8	1.395	1.5
51	Mobile Sources – Volume Source #38	1779	37.8	1.395	1.5
52	Mobile Sources – Volume Source #39	1782	37.8	1.395	1.5
53	Mobile Sources – Volume Source #40	1766	37.8	1.395	1.5
54	Mobile Sources – Volume Source #41	1854	37.8	1.395	1.5
55	Mobile Sources – Volume Source #42	1827	37.8	1.395	1.5
56	Mobile Sources – Volume Source #43	1852	37.8	1.395	1.5
57	Mobile Sources – Volume Source #44	1962	37.8	1.395	1.5
58	Mobile Sources – Volume Source #45	2017	37.8	1.395	1.5
59	Mobile Sources – Volume Source #46	2093	37.8	1.395	1.5
60	Mobile Sources – Volume Source #47	2184	37.8	1.395	1.5
61	Mobile Sources – Volume Source #48	2243	37.8	1.395	1.5
62	Mobile Sources – Volume Source #49	2327	37.8	1.395	1.5
63	Mobile Sources – Volume Source #50	2261	37.8	1.395	1.5
64	Mobile Sources – Volume Source #51	2251	37.8	1.395	1.5
65	Mobile Sources – Volume Source #52	2341	37.8	1.395	1.5
66	Mobile Sources – Volume Source #53	2359	37.8	1.395	1.5
67	Mobile Sources – Volume Source #54	2305	37.8	1.395	1.5
68	Mobile Sources – Volume Source #55	2340	37.8	1.395	1.5
69	Mobile Sources – Volume Source #56	2427	37.8	1.395	1.5
70	Mobile Sources – Volume Source #57	2480	37.8	1.395	1.5
71	Mobile Sources – Volume Source #58	2384	37.8	1.395	1.5
72	Mobile Sources – Volume Source #59	2329	37.8	1.395	1.5
73	Mobile Sources – Volume Source #60	2263	37.8	1.395	1.5
74	Mobile Sources – Volume Source #61	2206	37.8	1.395	1.5
75	Mobile Sources – Volume Source #62	2163	37.8	1.395	1.5
76	Mobile Sources – Volume Source #63	2103	37.8	1.395	1.5
77	Mobile Sources – Volume Source #64	2071	37.8	1.395	1.5
78	Mobile Sources – Volume Source #65	2185	37.8	1.395	1.5
79	Mobile Sources – Volume Source #66	2240	37.8	1.395	1.5
80	Mobile Sources – Volume Source #67	2282	37.8	1.395	1.5
81	Mobile Sources – Volume Source #68	2326	37.8	1.395	1.5
82	Mobile Sources – Volume Source #69	2305	37.8	1.395	1.5
83	Mobile Sources – Volume Source #70	2286	37.8	1.395	1.5
84	Mobile Sources – Volume Source #71	2284	37.8	1.395	1.5
85	Mobile Sources – Volume Source #72	2364	37.8	1.395	1.5
86	Mobile Sources – Volume Source #73	2410	37.8	1.395	1.5
87	Mobile Sources – Volume Source #74	2428	37.8	1.395	1.5
88	Mobile Sources – Volume Source #75	2478	37.8	1.395	1.5
89	Mobile Sources – Volume Source #76	2554	37.8	1.395	1.5
90	Mobile Sources – Volume Source #77	2620	37.8	1.395	1.5
91	Mobile Sources – Volume Source #78	2635	37.8	1.395	1.5
92	Mobile Sources – Volume Source #79	2637	37.8	1.395	1.5

TABLE D–5

(page 1 of 2)

ELSMERE CANYON LANDFILL – TOTAL OPERATIONS EMISSIONS

SHIFT 1 & 3

06:20:30 PM
26–Jul–94

Activity	CO Emissions (g/s)	ROC Emissions (g/s)	NO_X Emissions (g/s)	SO_2 Emissions (g/s)	PM_{10} Hourly (g/s)
Disposal Area[1]	1.45E–06	2.31E–05	1.41E–06	1.42E–07	3.33E–07
Fueling Area[1]	0.00E+00	5.45E–07	0.00E+00	0.00E+00	0.00E+00
Flare[2]	1.89E+01	1.14E+00	6.67E+00	2.11E+00	6.33E+00
Paved Haul Road[3] (IGM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E–02
Unpaved Haul Road[3] (IGM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E–01
Paved Haul Road[4] (FDM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.21E–04
Unpaved Haul Road[4] (FDM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.27E–03

[1] Modeled as area sources. Area source eimissions in $g/s/m^2$.

[2] Modeled as a point source

[3] Modeled as volumed sources.

[4] Modeled as line sources.

TABLE D-5
(page 2 of 2)
ELSMERE CANYON LANDFILL - TOTAL OPERATIONS EMISSIONS
SHIFT 2

06:20:30 PM
26-Jul-94

Activity	CO Emissions (g/s)	ROC Emissions (g/s)	NO_X Emissions (g/s)	SO_2 Emissions (g/s)	PM_{10} Hourly (g/s)
Disposal Area[1]	3.63E-06	2.36E-05	8.21E-06	8.98E-07	7.65E-06
Fueling Area[1]	0.00E+00	5.45E-07	0.00E+00	0.00E+00	0.00E+00
Flare[2]	1.89E+01	1.14E+00	6.67E+00	2.11E+00	6.33E+00
Paved Haul Road[3] (IGM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.58E-02
Unpaved Haul Road[3] (IGM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.67E+00
Paved Haul Road[4] (FDM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-03
Unpaved Haul Road[4] (FDM Model)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-02

[1] Modeled as area sources. Area source eimissions in $g/s/m^2$.
[2] Modeled as a point source
[3] Modeled as volumed sources.
[4] Modeled as line sources.

TABLE D-6

COMPARISON OF PROJECT IMPACTS WITH AMBIENT AIR QUALITY STANDARDS

16-Sep-94

Pollutant	Maximum Backround Concentration[1] (ug/m^3)	Location of Maximum Predicted Concentration UTM Coordinates (m) (x) Easting	(y) Northing	Maximum Modeled Project Impact[2] (ug/m^3)	Backround plus Modeled Project Impact (ug/m^3)	California Standard (ug/m^3)	National Standard (ug/m^3)
Carbon Monoxide (CO)							
1-Hour	22,038	363104	3800561	280.8	22,319	23,000	40,000
8-Hour	17,283 (C,N)	366000	3802000	90.5	17,374 (C,N)	10,000	10,000
Nitrogen Dioxide (NO_2)							
1-Hour	362	366000	3802000	87.8	450	470	---
Annual	76	363476	3802774	15.0	91	---	100
24-Hour Class I Area	N/A	408768	3798442	0.5	N/A		1.0[3]
Sulfur Dioxide (SO_2)							
1-Hour	53	366000	3802000	123.3	176	655	---
3-Hour	48[4]	366000	3802000	83.1	131	---	1300
24-Hour	37	366000	3802000	25.7	63	131	365
Annual	5	366000	3802000	2.3	7	---	80
Particulate Matter less than 10 microns in diameter (PM_{10})							
24-hour	100 (C)	365182	3802000	85.7	186 (C,N)	50	150
Annual	54 (C,N)	364476	3802774	15.9	70 (C,N)	30[5]	50[6]
24-hour Class I Area	N/A	408768	3798442	0.4	N/A	---	1.0[3]

[1] Data collected at Reseda monitoring station.

[2] All maximum impacts were located at a receptor on the property boundary

[3] The National Forest Service Criteria of Significance for a 24-hour average.

[4] SO_2 3-hour averages were not reported; therefore, a multiplying factor of 0.9 was used to approximate the 3-hour average concentration. (Air Toxics Assessment Manual, CAPCOA, 1987)

[5] Annual geometric mean.

[6] Annual arithmatic mean.

C indicates exceedance of California Standard

N indicates exceedance of National Standard

TABLE 1
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS

OFF–RAMP

Duration = 290 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Compressors	2	8	4.22	0.77	6.91	0.77	0.38	COMPRESSOR (b)	0.011	0.002	0.018	0.002	0.001
Loader	1	8	4.58	1.84	15.20	1.46	1.36	WHEELED LOADER	0.57	0.23	1.90	0.18	0.17
Gunnite Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Concrete Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Transit Mix	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Service Trucks	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Crane	3	8	16.20	3.60	40.80	3.43	3.36	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Generator	2	8	6.51	1.18	10.66	1.18	1.18	GENERATOR < 50 hp (b)	0.011	0.002	0.018	0.002	0.002
Asphalt Paver	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Water Truck	1	8	14.40	1.52	33.36	3.60	2.08	TRUCKS: OFF HIGHWAY	1.80	0.19	4.17	0.45	0.26
Tamper	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Auger/Fill Unit	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Lane Striper	1	8	14.40	1.52	33.36	3.60	2.08	OFF HIGHWAY TRUCK	1.8	0.19	4.17	0.45	0.26
Wheel Tractor	1	8	28.64	1.44	10.16	0.72	1.12	WHEELED TRACTOR	3.58	0.18	1.27	0.09	0.14
Off–Hwy Truck	6	8	86.40	9.12	200.16	21.60	12.48	OFF HIGHWAY TRUCK	1.8	0.19	4.17	0.45	0.26
Street Sweeper	1	8	14.40	1.52	33.36	3.60	2.08	OFF HIGHWAY TRUCK	1.8	0.19	4.17	0.45	0.26
Forklift	1	8	4.16	1.36	12.32	2.80	0.74	FORK LIFT – 175 hp	0.52	0.17	1.54	0.35	0.093
Backhoe	2	8	5.60	1.92	20.16	2.24	1.79	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
	Worst Case Daily Totals:(lbs)		260.91	38.78	571.14	57.65	41.48						
	Total Quarterly Emissions:(tons)		8.48	1.26	18.56	1.87	1.35						

a) SCAQMD CEQA Handbook, April 1993, Tables A9–8A & A9–8B
b) Emission factor is lb/hp–hr

TABLE 2
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS

ACCESS ROAD

Duration = 171 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Transit Mix	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Concrete Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Asphalt Paver	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Side boom	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Grader (b)	2	8	2.42	0.62	0.86	1.38	0.98	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Scrapers (b)	23	8	230.00	49.68	706.56	84.64	75.44	SCRAPER	1.25	0.27	3.84	0.46	0.41
Dozers (b)	7	8	19.60	6.72	70.56	7.84	6.27	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Water trucks	3	8	43.20	4.56	100.08	10.80	6.24	TRUCKS: OFF HIGHWAY	1.80	0.19	4.17	0.45	0.26
Roller – Steel Wheeled	2	8	4.80	1.04	13.92	1.07	0.80	ROLLER	0.30	0.07	0.87	0.07	0.05
Loader	1	8	1.61	0.76	6.64	0.61	0.47	TRACK–TYPE LOADER	0.20	0.10	0.83	0.08	0.06
	Worst Case Daily Totals(lbs)		312.42	65.78	925.82	108.62	92.44						
	Total Quarterly Emissions:(tons)		10.15	2.14	30.09	3.53	3.00						

(a) SCAQMD CEQA Handbook, April 1993, Tables A9–8A & A9–8B
(b) Major grading equipment exhaust emissions are included in this activity for purposes of estimating worst case day and quarter emissions. In reality the equipment would move to the support facilities pad sometime during the worst case quarter.

Table 3
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS

DISPOSAL AREA

Duration = 257 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Tractor–dozer	7	8	19.60	6.72	70.56	7.84	6.27	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Scraper	23	8	230.00	49.68	706.56	84.64	75.44	SCRAPER	1.25	0.27	3.84	0.46	0.41
Grader	2	8	2.42	0.62	0.86	1.38	0.98	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Compactor	1	8	28.64	1.44	10.16	0.72	1.12	WHEELED TRACTOR	3.58	0.18	1.27	0.09	0.14
Backhoe	1	8	2.80	0.96	10.08	1.12	0.90	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Loader	1	8	1.61	0.76	6.64	0.61	0.47	TRACK–TYPE LOADER	0.20	0.10	0.83	0.08	0.06
Service Trucks	3	8	16.20	3.60	40.80	3.43	3.36	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Off–Hwy Truck	6	8	86.40	9.12	200.16	21.60	12.48	OFF HIGHWAY TRUCK	1.8	0.19	4.17	0.45	0.26
Water Truck	3	8	43.20	4.56	100.08	10.80	6.24	TRUCKS: OFF HIGHWAY	1.80	0.19	4.17	0.45	0.26
Excavator	1	8	2.80	0.96	10.08	1.12	0.90	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Sideboom	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
	Worst Case Daily Totals:(lbs)		439.06	79.62	1169.58	134.40	109.27						
	Total Quarterly Emissions:(tons)		14.27	2.59	38.01	4.37	3.55						

a) SCAQMD CEQA Handbook, April 1993, Tables A9–8A & A9–8B

TABLE 4
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS

SEWER AND TRANSMISSION LINES

Duration = 236 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Backhoe	4	8	11.20	3.84	40.32	4.48	3.58	TRACK–TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Grader	1	8	1.21	0.31	0.43	0.69	0.49	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Transit Mix	5	8	27.00	6.00	68.00	5.72	5.60	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Dump Truck	5	8	72.00	7.60	166.80	18.00	10.40	OFF HIGHWAY TRUCK	1.80	0.19	4.17	0.45	0.26
Asphalt Paver	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Water Truck	2	8	28.80	3.04	66.72	7.20	4.16	TRUCKS: OFF HIGHWAY	1.80	0.19	4.17	0.45	0.26
Tamper	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Lane Striper	1	8	14.40	1.52	33.36	3.60	2.08	OFF HIGHWAY TRUCK	1.80	0.19	4.17	0.45	0.26
Sideboom	3	8	16.20	3.60	40.80	3.43	3.36	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Roller	1	8	2.40	0.52	6.96	0.54	0.40	ROLLER	0.3	0.065	0.87	0.067	0.05
Trencher	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Off–Hwy Truck	1	8	14.40	1.52	33.36	3.60	2.08	OFF HIGHWAY TRUCK	1.80	0.19	4.17	0.45	0.26
Service Truck	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Compressor	3	8	6.34	1.15	10.37	1.15	0.58	COMPRESSOR (b)	0.011	0.002	0.018	0.002	0.001
Loader	1	8	4.58	1.84	15.20	1.46	1.36	WHEELED LOADER	0.57	0.23	1.90	0.18	0.17
Bending Machine	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
	Worst Case Daily Totals:(lbs)		234.71	37.59	563.97	54.99	40.10						
	Total Quarterly Emissions:(tons)		7.63	1.22	18.33	1.79	1.30						

a) SCAQMD CEQA Handbook, April 1993, Tables A9–8A & A9–8B
b) Emission factor is lb/hp–hr

TABLE 5
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS

SUPPORT/RECYCLING FACILITIES

Duration = 129 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Crane	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS–DIESEL	0.68	0.15	1.70	0.14	0.14
Forklift	2	8	8.32	2.72	24.64	5.60	1.49	FORK LIFT – 175 hp	0.52	0.17	1.54	0.35	0.093
	Worst Case Daily Totals:(lbs)		13.72	3.92	38.24	6.74	2.61						
	Total Quarterly Emissions:(tons)		0.45	0.13	1.24	0.22	0.08						

a) SCAQMD CEQA Handbook, April 1993, Tables A9–8A & A9–8B

TABLE 6
CONSTRUCTION SOIL DISTURBANCE PM10 EMISSIONS

CONSTRUCTION ACTIVITY (a)	No. of Equipment	hours per day	VMT/day	Area (a) (acres)	Days of Construction	Emission Factor (b)	Units	PM10 (lbs/day)
Grading								
Offramp				18.0	113.4	26.4	lbs/acre day	4.2
Support Facilities				14.8	58.38	26.4	lbs/acre day	6.7
Dirt Pushing (dozers)(f)	7	8				1.3	lbs/hr	72.8
Earth Moving (scrappers)	23		80			4.3	lbs/VMT	7912.0
PM10 FROM CONSTRUCTION ACTIVITIES (lbs/day) (d) =								7991.5
PM10 FROM CONSTRUCTION ACTIVITIES (tons/Qtr) (c)(e) =								259.7

(a) Acres per day determined by total acres per area to be cleared, and graded divided by the number of days.

(b) SCAQMD CEQA Air Quality Handbook, Table A9–9 (SCAQMD 1993).

(c) Based upon 65 construction days per quarter.

(d) The grading of the offramp and the support facilities would occur during the same worst case quarter. The worst case daily emissions include the highest daily emissions and the dirt pushing and earthmoving daily emissions.

(e) The offramp grading would occur during 2/3 of the worst case construction quarter and then is predicted to move to the support facilities for the rest of the quarter. Therefore, the tons per quarter for grading operations are represented by 2/3 of the offramp emissions and 1/3 of the support facilities emissions and the dirt pushing and earthmoving emissions for a period of 65 days.

(f) Emission factor calculated in Table 17.

APPENDIX D

Table 7

TRANSMISSION CONSTRUCTION SOIL DISTURBANCE
FUGITIVE PM10 EMISSIONS

SOURCE	DIRT REMOVED FT3	DIRT BACKFILLED FT3	DIRT HAULED FT3	DIRT STOCKPILED FT3	PIPELINE HAULED	NUMBER OF DAYS	EMISSIONS LBS/DAY
Modified Grading	36000.00					335	0.13
Storage Pile				34603.73		335	0.10
Trench Backfilling		34603.73				335	0.25
Truck Loading (a)			0.00			335	0.00
Dirt Hauling (a)			0.00			335	0.00
Pipeline Delivery (b)					1396.27	335	0.61
Dirt Dumping (a)			0.00			335	0.00
				TOTAL PM10 LB/DAY			1.09
				TOTAL PM10 TONS/QTR			0.04

(a) Assumes all excavated dirt will be compacted into the trench
(b) Assumes dirty road and one way trip

VOLUME OF DIRT

SOURCE	LENGTH ft	WIDTH ft	DEPTH ft	DIAMETER (e) ft	VOLUME ft3	VOLUME yd3
Trench	4000	3.00	3.00		36000.00	1333.33
Pipeline	4000			0.67	1396.27	51.71

EMISSION FACTORS

SOURCE	LB/FT3 (c)
Modified Grading (a)	0.001212
Storage Pile (a)	0.000982
Trench Backfilling (a)	0.0024
Truck Loading (a)	0.001114
Dirt Hauling (b)	0
Pipeline Delivery (b)	0.147116
Dirt Dumping (a)	0.0005

Source	miles/trip	Number Vehicles (d)	one-way trips	VMT
Haul Truck	0	5.17	2	0.00
Pipe Truck	10	5.17	2	103.43

(a) Emission factors supplied by Shalini George of the SCAQMD 2/19/93
(b) Emission factors supplied by Shalini George of the SCAQMD 2/19/93 was modified for miles/trip
(c) Assumes soil density of 2935 lb/yd3
(d) Assumes 10 yd3 of pipe or dirt/truck trip and unpaved road travel 23 lb/VMT
(e) Assumes that the conduit is 8" diameter.

Table 8

SEWER CONSTRUCTION SOIL DISTURBANCE
FUGITIVE PM10 EMISSIONS

SOURCE	DIRT REMOVED FT3	DIRT BACKFILLED FT3	DIRT HAULED FT3	DIRT STOCKPILED FT3	PIPELINE HAULED	NUMBER OF DAYS	EMISSIONS LBS/DAY
Modified Grading	45173.33					335	0.16
Storage Pile				42593.03		335	0.13
Trench Backfilling		42593.03				335	0.31
Truck Loading (a)			0.00			335	0.00
Dirt Hauling (a)			0.00			335	0.00
Pipeline Delivery (b)					2580.30	335	1.13
Dirt Dumping (a)			0.00			335	0.00
				TOTAL PM10 LB/DAY			1.73
				TOTAL PM10 TONS/QTR			0.06

(a) Assumes all excavated dirt will be compacted into the trench
(b) Assumes dirty road and one way trip

VOLUME OF DIRT

SOURCE	LENGTH ft	WIDTH (e) ft	DEPTH(f) ft	DIAMETER ft	VOLUME ft3	VOLUME yd3
Trench	7392	1.67	3.67		45173.33	1673.09
Pipeline	7392			0.67	2580.30	95.57

EMISSION FACTORS

SOURCE	LB/FT3 (c)
Modified Grading (a)	0.001212
Storage Pile (a)	0.000982
Trench Backfilling (a)	0.0024
Truck Loading (a)	0.001114
Dirt Hauling (b)	0.000
Pipeline Delivery (b)	0.147116
Dirt Dumping (a)	0.0005

Source	miles/trip	Number Vehicles (d)	one-way trips	VMT
Haul Truck	0	9.56	2	0.00
Pipe Truck	10	9.56	2	191.13

(a) Emission factors supplied by Shalini George of the SCAQMD 2/19/93
(b) Emission factors supplied by Shalini George of the SCAQMD 2/19/93 was modified for miles/trip
(c) Assumes soil density of 2935 lb/yd3
(d) Assumes 10 yd3 of pipe or dirt/truck trip and unpaved road travel 23 lb/VMT
(e) Assumes an additional 6 inches past the diameter of pipe
(f) Assumes 30 inches below grade + 6 inches past the diameter of the pipe

Elsmnfnl.wk3, 30-August-94

APPENDIX E

APPENDIX F

APPENDIX D

TABLE 9
ELSMERE CANYON LANDFILL
TRUCK TRANSPORT EMISSIONS
CONSTRUCTION

	IDLE TIME MIN/OWT (a)	ROUND TRIPS/ DAILY (b)	AVERAGE MILEAGE (MI/RT)	EMISSIONS (lb/day)(c)(d) ROC	NOx	SO2	CO	PM
Offramp Duration = 290 working days (65 working days per quarter)								
Transit Mix Trucks	20	4	20	2.85	3.92	0.20	25.54	0.23
Service Trucks	20	4	20	2.85	3.92	0.20	25.54	0.23
WORST CASE DAILY TOTALS: (lbs)				5.70	7.84	0.40	51.08	0.46
QUARTERLY EMISSIONS: (tons/qtr)				0.19	0.25	0.01	1.66	0.02
Access Road Duration = 172 working days (65 working days per quarter)								
Transit Mix Trucks	20	2	20	2.76	3.49	0.17	24.07	0.19
WORST CASE DAILY TOTALS: (lbs)				2.76	3.49	0.17	24.07	0.19
QUARTERLY EMISSIONS: (tons/qtr)				0.09	0.11	0.01	0.78	0.01
Pipeline Duration = 236 working days (65 working days per quarter)								
Transit Mix Trucks	20	5	20	2.89	4.13	0.21	26.28	0.25
Service Trucks	20	4	20	2.85	3.92	0.20	25.54	0.23
WORST CASE DAILY TOTALS: (lbs)				5.74	8.05	0.41	51.82	0.48
QUARTERLY EMISSIONS: (tons/qtr)				0.19	0.26	0.01	1.68	0.02

(a) OWT = one-way trip

(b) Number of vehicle round trips is based on number of daily vehicles making one round trip per day
Mileages are estimates

(c) Total emissions include moving truck and idle truck emissions

(d) – SCAQMD CEQA Handbook, April 1993, Tables A9-5-J-4 and A9-5-L

MIX/SERVICE TRUCK EMISSION FACTORS

Mode		ROC	NOx	SO2 (b)	CO	PM
Running exhaust (g/mile)	(a)	1.01	4.87	0.32	16.71	0.51
Cold start (g/vehicle/day)	(a)	2.55	1.99	N/A	37.55	N/A
Hot start (g/vehicle/day)	(a)	0.80	1.00	N/A	4.10	N/A
Hot soak (g/vehicle/day)	(a)	1.48	N/A	N/A	N/A	N/A
Diurnal (g/vehicle/day)	(a)	5.32	N/A	N/A	N/A	N/A
Idle (g/min) (c)		1.26	1.66	0.08	11.77	0.08

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4, Area 2
- Average speed of 20 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6001 lbs and up including medium-duty and light/heavy-duty, medium/heavy-duty and heavy/heavy-duty vehicles
- Average trips/vehicle = 2 (1 RT)
- Trucks: 50.07% CS and 49.93% HS
- PM emissions include exhaust particulates and tire wear

b – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-L

c – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4
- 5 mph for running exhaust and evaporative
- 20 minutes idle time per day
- PM10 emissions are exhaust only

TABLE 10
ELSMERE CANYON LANDFILL – EMPLOYEE VEHICLE EMISSIONS

MAXIMUM # OF VEHICLES (a)	PROJECT ACTIVITY	VEHICLES PER DAY (b)	AVERAGE MILEAGE (MI/RT)	WORST CASE DAILY TOTAL EMISSIONS (lb/day)(d) ROC	NOx	SO2	CO	PM
CONSTRUCTION ACTIVITIES (c)								
Total Duration = 386 working days (65 working days/quarter)								
173	Construction	1	60	10.43	15.61	1.37	189.87	2.40
		Quarterly Emissions: (tons)		0.34	0.51	0.04	6.17	0.08
FACILITY OPERATIONS								
Total Duration = 305 days/year								
80	Disposal Area	1	60	4.82	7.22	0.63	87.80	1.11
		Annual Emissions: (tons)		0.74	1.10	0.10	13.39	0.17
Total Duration = 260 days/year								
63	Support Facilities	1	60	3.80	5.68	0.50	69.14	0.88
		Annual Emissions: (tons)		0.49	0.74	0.06	8.99	0.11
Total Duration = 260 days/year								
136	Recycling Facilities	1	60	8.20	12.27	1.08	149.26	1.89
		Annual Emissions: (tons)		1.07	1.60	0.14	19.40	0.25

EMPLOYEE VEHICLE EMISSION FACTORS

Mode		ROC	NOx	SO2(b)	CO	PM(c)
Running exhaust (g/mile)	(a)	0.25	0.62	0.06	6.83	0.11
Cold start (g/vehicle)	(a)	4.34	2.54	N/A	79.08	N/A
Hot start (g/vehicle)	(a)	0.87	1.19	N/A	8.95	N/A
Hot soak (g/vehicle)	(a)	1.88	N/A	N/A	N/A	N/A
Diurnal (g/vehicle)	(a)	5.26	N/A	N/A	N/A	N/A

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4, Area 2
- Average speed of 20 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6000 lbs or less including light automobiles, light duty trucks, vans, station wagons and 4x4 trucks
- Average trips/vehicle/day = 2 (1 RT between home and work)
- Passenger vehicles: 52.85% CS and 47.15% HS

(b) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-L

(c) – Total particulates include exhaust particulates and tire wear

a – The following assumptions are being made:

- Total construction activity is based on an average work force of 184 people
- Disposal area operation is based on an average work force of 80 people
- Support facilities operations are based on an average work force of 63 people
- Recycling facilities operations are based on an average work force of 136 people

b – RT = 1 round trip between home and work per vehicle per day

c – Construction activities include support facilities, recycling facilities, access road, off-ramp, and the utilities and disposal area

d – SCAQMD CEQA Handbook, April 1993, Tables A9-5-J-4 and A9-5-L

APPENDIX D

TABLE 11
ELSMERE CANYON LANDFILL – OPERATIONS EQUIPMENT EMISSIONS

DISPOSAL AREA – SHIFTS 1 & 3

Duration = 305 working days

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Tractor	5	16	28.00	9.60	100.80	11.20	8.96	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Compactor	2	16	114.56	5.76	40.64	2.88	4.48	WHEELED TRACTOR	3.58	0.18	1.27	0.09	0.14
Light Plants	4	12	19.54	3.55	31.97	3.55	3.55	GENERATOR < 50 hp (b)	0.011	0.002	0.018	0.002	0.002
Service Truck	1	2	1.35	0.30	3.40	0.29	0.28	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Water Truck	2	16	23.48	2.51	5.54	0.34	0.54	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
	Worst Case Daily Totals:(lbs)		186.93	21.72	182.35	18.26	17.81						
	Annual Emissions:(tons)		28.51	3.31	27.81	2.78	2.72						

DISPOSAL AREA – SHIFT 2

Duration = 305 working days

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Tractor/Dozer	7	8	19.60	6.72	70.56	7.84	6.27	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Compactor	2	8	57.28	2.88	20.32	1.44	2.24	WHEELED TRACTOR	3.58	0.18	1.27	0.09	0.14
Blade	1	8	1.21	0.31	0.43	0.69	0.49	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Loader	3	8	13.73	5.52	45.60	4.37	4.08	WHEELED LOADER	0.57	0.23	1.90	0.18	0.17
Water Truck	4	8	23.48	2.51	5.54	0.34	0.54	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Scraper	10	8	100.00	21.60	307.20	36.80	32.80	SCRAPER	1.25	0.27	3.84	0.46	0.41
Backhoe	1	8	2.80	0.96	10.08	1.12	0.90	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Excavator	1	8	2.80	0.96	10.08	1.12	0.90	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Service Truck	1	1	0.68	0.15	1.70	0.14	0.14	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
	Worst Case Daily Totals:(lbs)		221.37	41.61	471.52	53.86	48.35						
	Annual Emissions:(tons)		33.76	6.35	71.91	8.21	7.37						

a) SCAQMD CEQA Handbook, April 1993, Table A9-8A
b) Emission factor is lb/hp-hr

Table 12

ELSMERE CANYON LANDFILL – OPERATIONAL EQUIPMENT EMISSIONS

WOOD GREEN WASTE PROCESSING FACILITY

Duration = 8 Hours/Day, 5 Days/Week, 52 weeks/Year

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	RATED HP	HOURLY LOAD FACTOR	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hp-hr) CO	ROC	NOx	SOx	PM10
Wood Hog/Mulcher	1	8	400	0.6	3.65	1.15	16.51	1.15	0.58	STATIONARY HEAVY DUTY ENGINES – DIESEL	0.002	0.0006	0.0086	0.0006	0.0003
			Worst Case Daily Totals:(lbs)		3.65	1.15	16.51	1.15	0.58						
			Annual Emissions:(tons)		0.47	0.15	2.15	0.15	0.07						

a) SCAQMD CEQA Handbook, April 1993, Tables A9-3-A

ASPHALT AND CONCRETE PROCESSING FACILITY

Duration = 8 Hours/Day, 7 Days/Week, 6 Weeks/Year

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	RATED HP	HOURLY LOAD FACTOR	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hp-hr) CO	ROC	NOx	SOx	PM10
Crusher	1	8	1000	0.6	9.12	2.88	41.28	2.88	1.44	STATIONARY HEAVY DUTY ENGINES – DIESEL	0.002	0.0006	0.0086	0.0006	0.0003
			Worst Case Daily Totals:(lbs)		9.12	2.88	41.28	2.88	1.44						
			Annual Emissions:(tons)		0.19	0.06	0.87	0.06	0.03						

a) SCAQMD CEQA Handbook, April 1993, Tables A9-3-A

ASPHALT & CONCRETE MATERIAL HANDLING PM10 EMISSIONS

Duration = 8 Hours/Day, 7 Days/Week, 6 Weeks/Year

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	TONS CRUSHED PER HOUR (TONS/HR)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	USEPA AP-42 (a)	EMISSION FACTORS (lb/ton) CO	ROC	NOx	SOx	PM10
Crusher	1	8	500	N/A	N/A	N/A	N/A	72.00	CRUSHERS	N/A	N/A	N/A	N/A	0.018
			Worst Case Daily Totals:(lbs)	N/A	N/A	N/A	N/A	72.00						
			Annual Emissions:(tons)	N/A	N/A	N/A	N/A	1.51						

(a) USEPA AP-42, Volume I, Section 8.19.1-3, Table 8.19.1-1, for wet primary or secondary crushing

TABLE 13

UNDERGROUND 10,000 GALLON STORAGE TANK
GASOLINE

Activity	Throughput 1000 gal/day	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	EMISSION FACTORS (lb/1000 gal) CO	TOC (a)	NOx	SOx	PM10
Filling	0.10	N/A	0.03	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A
Breathing and Emptying	0.10	N/A	0.09	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A
Vehicle Refueling (controlled)	0.10	N/A	0.08	N/A	N/A	N/A	N/A	0.9	N/A	N/A	N/A
WORST CASE DAILY TOTALS: (lbs/day)		N/A	0.20	N/A	N/A	N/A					
Annual Emissions: (tons/yr)		N/A	0.04	N/A	N/A	N/A					

(a) ROC = TOC * 0.92; per SCAQMD CEQA Handbook, April 1993, Table A9–6

TABLE 14

ABOVEGROUND 50,000 GALLON STORAGE TANK – FIXED ROOF
DIESEL FUEL
HYDROCARBON FUGITIVE EMISSIONS (POUNDS)

PRODUCT CHARACTERISTICS	TOTAL ANNUAL LOSS	TOTAL DAILY LOSS
REID VAPOR PRESSURE, psia, (Pr)	0.022	0.022
TRUE VAPOR PRESSURE, psia, (P)	0.0074	0.0074
AVG. ATM. VAPOR PRESSURE, psia, (Pa)	13.8	13.8
TANK DIAMETER, ft., (D)	21.5	21.5
TANK CAPACITY, gal, (V)	50000	50000
AVG. VAPOR SPACE HT. W/ CORR. FACT., ft., (H)	9.5	9.5
AVG. AMB. DIURNAL TEMP CHANGE, deg.F, (DT)	26	26
PAINT FACTOR, (Fp) Light Gray	1.33	1.33
ADJUSTMENT FACTOR FOR SMALL DIA. TANKS, (C)	0.92	0.92
PRODUCT FACTOR, (Kc)	1.0	1.0
VAPOR MOLECULAR Wt., lb/lb–MOLE (Mv)	130	130
NO. OF ANNUAL TURNOVERS, (N) (a)	39.18	0.10
VAPOR RECOVERY EFFICIENCY, % (eff)	95	95
TURNOVER FACTOR, (Kn)	0.72	0.72
FIXED ROOF BREATHING LOSS, (Lb) *	3.48	9.54E–03
FIXED ROOF WORKING LOSS, (Lw) **	1.63	4.17E–03
TOTAL LOSS	5.11	1.37E–02

* FIXED ROOF BREATHING LOSS, lb/yr
Lb = 0.0226*Mv*(P/(Pa–P))^0.68*D^1.73*H^0.51*DT^0.50*Fp*C*Kc*(1–eff)

** FIXED ROOF WORKING LOSS, lb/yr
Lw = 2.40E–05*Mv*P*V*N*Kn*Kc(1–eff)

(a) Based on an estimated 1,959,000 gallons annual usage.

APPENDIX F

APPENDIX G

APPENDIX E

TABLE 15
Landfill Gas Combustion Emissions

Equipment	Amount	Heat Content BTU/scf	Design Capacity scfm	Heat Rate MMBTU/hr	EMISSIONS (lb/day) CO	ROG	NOx	SOx	PM10	EMISSION FACTORS (lb/MMBTU) CO (a)	ROG (b)	NOx (c)	SOx (d)	PM10 (e)
Flares	10	350	4200	882	3598.56	218.03	1270.08	402.19	1206.58	0.17	0.0103	0.06	0.019	0.057
	Annual Emissions (tons)				656.74	39.79	231.79	73.40	220.20					

(a) Average of CO emission factor range of 0.05 – 0.29 lb/MMBtu (Personal communication, Jay Chen, SCAQMD, 1992)
(b) Derived from raw gas analysis results (92.3% of NMOC = ROG, Radian, 1992) and assumption of 98% ROG destruction efficiency (Personal communication, Jay Chen, SCAQMD, 1992)
(c) SCAQMD Best Available Control Technology (SCAQMD, 1990)
(d) Derived from SCAQMD Rule 431.1 (Personal communication, Jay Chen, SCAQMD, 1992)
(e) Derived from SCAQMD BACT determination for PM10 (draft) = 20 lb PM10/MMcf (Personal communication, Jay Chen, SCAQMD, 1992)

TABLE 16
Fugitive Landfill Gas Emissions

Source	LFG Generated Mg/yr	Density Mg/ton	Percent Fugitive Emissions (a)	% ROC of NMOC	Fugitve ROC Emissions lbs/day
Landfill	2647	0.91	30.0%	92.3%	4427.08
			Annual Emissions: (tons)		807.94

(a) The LFG collection system is 70% efficient, therefore the fugitive ROC emissions are 30% of the LFG generated.

TABLE 17
FUGITIVE PM10 FROM DISPOSAL OPERATIONS

OPERATION ACTIVITY (a)	Operation hrs/day	Number of Vehicles	VMT mi/day	Area (acres)	Emission Factor	Units	PM10 (lbs/day)	PM10 (tons/yr)
Shift 1 Disposal								
Tractor (dirt pushing)	8	5			0.0041	lb/hr	0.2	0.0
Wind Erosion (b)				231.4	0.051	lb/acre/shift (c)	12.4	2.3
Shift 2 Disposal								
Tractor/Dozer (dirt pushing)	8	7			0.42	lb/hr	23.3	3.6
Blade (dirt pushing)	8	1			0.42	lb/hr	3.3	0.5
Loader (unpaved road travel)		1	15		0.26	lb/mi (daily)	3.9	
					0.17	lb/mi (annual)		0.4
Scraper (earthmoving)		10	1.2		0.65	lb/mi	7.7	1.2
Scraper (unpaved road travel)		10	40		0.35	lb/mi (daily)	140.0	
					0.22	lb/mi (annual)		13.4
Water Trucks (unpaved road travel)		2	96		0.94	lb/mi (daily)	180.5	
					0.61	lb/mi (annual)		17.9
Wind Erosion (b)				231.4	0.051	lb/acre/shift (c)	12.4	2.3
Shift 3 Disposal								
Tractor (dirt pushing)	8	5			0.0041	lb/hr	0.2	0.03
Wind Erosion (b)				231.4	0.05	lb/acre/shift (c)	12.4	2.3
PM10 FROM OPERATION ACTIVITIES Shifts 1 & 3							25.2	4.6
PM10 FROM OPERATION ACTIVITIES Shift 2							371.2	39.2

(a) Operation activities entail the use of heavy-duty construction equipment including: tractors, scrappers, dozers, compactors, excavators, backhoes and blades.
(b) Based upon the largest exposed surface area, Phase 3
(c) The lb/acre/day emission factor was divided by 3 to convert to a lb/acre/shift emission factor.

EMISSION FACTORS FROM DISPOSAL OPERATIONS

Operation Activity	Silt Content	Surface Erodibility Factor (b)	% Wind Speed > 12 mph (c)	Precipitation Evaporation Index (b)	Moisture Content	Emission Factor	Unit	Rule 403 Fugitive Control	Control Efficiency (f)	Rule 403 Emission Factor (d)
Wind Erosion (b)	15	86	1.1	35		1.44	lb/acre/day	Soil stabilizers Water active sites twice daily	65.0% 68.0%	0.2
Dirt Pushing (a)	15				15	1.30	lb/hr	Water active sites twice daily	68.0%	0.4
Waste Pushing	1				50	0.0041	lb/hr		0.0%	0.0041
Earth Moving (e)						4.3	lb/VMT	Water three times daily	85.0%	0.6

(a) Assumes a silt content equivalent to blended ore and dirt, and a moisture content for moist dirt using SCAQMD CEQA Air Quality Handbook, Table A-9-9-F.
(b) Puente Hills Waste Management Facilities, Draft Environmental Impact Report Technical Appendices, June 1992, Appendix G
(c) 1981 Newhall meteorological data from SCAQMD
(d) Combined affect of control measures estimated as per SCAQMD CEQA Handbook Appendix 11, Table A11-9
(e) SCAQMD CEQA Air Quality Handbook, Table A9-9 (SCAQMD 1993).
(f) SCAQMD CEQA Air Quality Handbook, Table A11-9-A (SCAQMD 1993)

TABLE 18
ELSMERE CANYON LANDFILL – LANDFILL USER EMISSIONS

User Vehicle	Idle Time (min/OWT)(a)	Vehicles Per Day(b)	Inside Site Avg. Miles (mi/RT)	Outside Site Avg. Miles (mi/RT)	WORST CASE DAILY TOTAL EMISSIONS (lb/day)(d) ROC	NOx	SO2	CO	PM
Refuse Transfer Truck (c)(e)	20	525	8.51	26	123.82	240.05	14.63	1042.08	22.22
Refuse Collection Truck(c)	20	619	8.51	40	165.29	376.07	23.37	1547.90	35.94
Miscellaneous Vehicles	20	121	5	20	5.44	5.21	0.40	71.74	0.70
Delivery/Supply Trucks(c)	20	15	5	30	3.40	6.89	0.42	29.41	0.64
		Annual Emissions: (tons)			45.44	95.80	5.92	410.40	9.08

(a) RT = round trip; OWT = one way trip
(b) Number of vehicle round trips is based on number of daily vehicles making one round trip per day
Mileages are estimates
(c) Total emissions include moving truck and idle truck emissions
(d) SCAQMD CEQA Handbook, April 1993, Tables A9–5–J–4 and A9–5–L
(e) The mileage is based on the maximum marginal distance from the waste centroid to the project as compared to other waste disposal facilities

MISCELLANEOUS VEHICLE EMISSION FACTORS

Mode		ROC	NOx	SO2(b)	CO	PM
Running exhaust (w/o site) (g/mile)	(a)	0.25	0.62	0.06	6.83	0.11
Running exhaust (w/ site) (g/mile)	(c)	0.61	0.68	0.06	8.06	0.11
Cold start (g/vehicle)	(a)	4.34	2.54	N/A	79.08	N/A
Hot start (g/vehicle)	(a)	0.87	1.19	N/A	8.95	N/A
Hot soak (g/vehicle)	(a)	1.88	N/A	N/A	N/A	N/A
Diurnal (g/vehicle)	(a)	5.26	N/A	N/A	N/A	N/A

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9–5–J–4, Area 2
- Average speed of 20 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6000 lbs or less including light automobiles, light duty trucks, vans, station wagons and 4x4 trucks
- Average trips/vehicle = 2 (1 RT)
- Passenger vehicles: 52.85% CS and 47.15% HS
- PM include exhaust particulates and tire wear

(b) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9–5–L

(c) – Within property boundaries at 15 mph

TRUCK COLLECTION/TRANSPORT EMISSION FACTORS

Mode		ROC	NOx	SO2(b)	CO	PM(c)
Running exhaust (w/o site) (g/mile)	(a)	1.01	4.87	0.32	16.71	0.51
Running exhaust (w/ site) (g/mile)	(d)	2.37	5.24	0.32	22.19	0.51
Cold start (g/vehicle/day)	(a)	2.55	1.99	N/A	37.55	N/A
Hot start (g/vehicle/day)	(a)	0.80	1.00	N/A	4.10	N/A
Hot soak (g/vehicle/day)	(a)	1.48	N/A	N/A	N/A	N/A
Diurnal (g/vehicle/day)	(a)	5.32	N/A	N/A	N/A	N/A
Idle (g/min) (c)		1.26	1.66	0.08	11.77	0.08

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9–5–K–4, Area 2
- Average speed of 20 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6001 lbs and up including medium-duty and light/heavy-duty, medium/heavy-duty and heavy/heavy-duty vehicles
- Average trips/vehicle = 2 (1 RT)
- Trucks: 50.07% CS and 49.93% HS
- PM emissions include exhaust particulates and tire wear

(b) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9–5–L

(c) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9–5–K–4
- 5 mph for running exhaust and evaporative
- 20 minutes idle time per day
- PM10 emissions are exhaust only

(d) – Within property boundaries at 15 mph

TABLE 19

ONSITE PM10 VEHICLE PAVED ROADWAY EMISSIONS

TRANSPORT VEHICLES	NUMBER OF VEHICLES PER DAY (b)	NUMBER OF RT's PER VEHICLE/DAY	AVERAGE MILEAGE (MI/RT)	DAILY PM10 (lbs)	ANNUAL PM10 (tons)
Compactor Trucks	619	1	8	297	45
Transport Trucks	525	1	8	252	38
Miscellaneous Vehicles (a)	400	1	4	32	5
Water Trucks	2	32	8	31	5
Delivery/Supply Trucks	15	1	4	4	1
			TOTAL PM10 =	616	94

(a) Includes employee vehicles, delivery trucks, and vehicles using the Recycling Facilities, Truck Service Center, and the Equestrian/Hiking Trail.

(b) These are approximate daily figures, actual number of vehicles may vary.

PM10 EMISSION FACTORS FOR PAVED ROADWAYS

SOURCE	EMISSION FACTOR (lb/mile)
Compactor/Transport Trucks (b)	0.060
Miscellaneous Vehicles, < 6000 lbs (a)	0.003
Miscellaneous Vehicles, > 6001 lbs (b)	0.060
Delivery/Supply Trucks (b)	0.060

NUMBER OF VEHICLES	
Miscellaneous Vehicles, < 6000 lbs	279
Miscellaneous Vehicles, > 6001 lbs	121
Refuse collection	1144
Delivery trucks	15

(a) SCAQMD CEQA Air Quality Handbook, April 1993, Table A9-9 default value for Passenger Vehicles on Paved Roadways (with street cleaning).

(b) Site specific emission factor developed in coordination with the SCAQMD.

ONSITE PM10 VEHICLE UNPAVED ROADWAY EMISSIONS

TRANSPORT VEHICLES	NUMBER OF VEHICLES PER DAY (a)	NUMBER OF RT's PER VEHICLE/DAY	AVERAGE MILEAGE (MI/RT)	DAILY PM10 (lbs)	ANNUAL PM10 (tons)
Compactor Trucks	619	1	0.5	170	17
Transport Trucks	525	1	0.5	255	25
Miscellaneous Vehicles, < 6000 lbs	2	10	1	2	0.2
Miscellaneous Vehicles, > 6001 lbs	2	3	1	2	0
			TOTAL PM10 =	425	42

(a) These are approximate daily figures, actual number of vehicles may vary.

PM10 EMISSION FACTORS FOR UNPAVED ROADWAYS

SOURCE	EMISSION FACTOR (lb/mile) (a) Daily	Annual
Compactor Trucks	0.55	0.35
Transport Trucks	0.97	0.63
Miscellaneous Vehicles, < 6000 lbs (a)	0.08	0.05
Miscellaneous Vehicles, > 6001 lbs (b)	0.41	0.27

NUMBER OF VEHICLES	
Refuse collection	1144
Miscellaneous Vehicles, < 6000 lbs	2
Miscellaneous Vehicles, > 6001 lbs	2

(a) The annual emission factor is lower than the daily since the daily emission factor does not include precipitation. Emission factors calculated in Table 19a.

TABLE 20A

ELSMERE CANYON LANDFILL – TOTAL CONSTRUCTION EQUIPMENT

	CO		ROC		NOx		SO2		PM10	
Activity	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)
Access Road	312	10.2	66	2.1	926	30.1	109	3.5	92	3.0
Sewer/Transmission	235	7.6	38	1.2	564	18.3	55	1.8	40	1.3
Off–Ramp	261	8.5	39	1.3	571	18.6	58	1.9	41	1.3
Pipeline Fug. dust (a)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	0.1
Fugitive Dust	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7991	259.7
TOTAL	808	26.3	142	4.6	2061	67.0	221	7.2	8167	265.4

(a) Worst–case emissions for sewer and transmission lines combined.

TABLE 20A
(CONTINUED)
ELSMERE CANYON LANDFILL – TOTAL CONSTRUCTION TRANSPORT

Activity	CO		ROC		NOx		SO2		PM10	
	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)	Worst Case Daily (lb/day)	(ton/qtr)
Trucks for Access Road	24	0.8	3	0.1	3	0.1	0.2	0.01	0.2	0.01
Trucks for Pipeline	52	1.7	6	0.2	8	0.3	0.4	0.01	0.5	0.02
Trucks for Off–Ramp	51	1.7	6	0.2	8	0.3	0.4	0.01	0.5	0.02
Employee Vehicles	190	6.2	10	0.3	16	0.5	1.4	0.04	2.4	0.08
TOTAL	317	10.3	25	0.8	35	1.1	2.4	0.08	3.6	0.11

TABLE 20A
(CONTINUED)
ELSMERE CANYON LANDFILL – TOTAL OPERATION EQUIPMENT

Activity	CO		ROC		NOx		SO2		PM10	
	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)
Disposal Area (shifts 1,2,&3)	408	62.3	63	9.7	654	99.7	72	11.0	66	10.1
Wood/Green Waste Processing Facility	4	0.5	1	0.1	17	2.1	1	0.1	1	0.1
Asphalt and Concrete Facility	9	0.2	3	0.1	41	0.9	3	0.1	73	1.5
Fuel Storage and Dispensing	N/A	N/A	0.2	0.04	N/A	N/A	N/A	N/A	N/A	N/A
Fugitive Dust Disposal Operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	396	43.8
Paved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	616	94.0
Unpaved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	425	41.7
Landfill Gas Flare	3599	656.7	218	39.8	1270	231.8	402	73.4	1207	220.2
Fugitive Landfill Gas	N/A	N/A	4427	807.9	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	4020	719.7	4713	857.6	1982	334.5	478	84.6	2784	411.4

TABLE 20A
(CONCLUDED)
ELSMERE CANYON LANDFILL – TOTAL OPERATION TRANSPORT

Activity	CO Worst Case Daily (lb/day)	CO (ton/yr)	ROC Worst Case Daily (lb/day)	ROC (ton/yr)	NOx Worst Case Daily (lb/day)	NOx (ton/yr)	SO2 Worst Case Daily (lb/day)	SO2 (ton/yr)	PM10 Worst Case Daily (lb/day)	PM10 (ton/yr)
Refuse Collection Trucks	2590	395.0	289	44.1	616	94.0	38	5.8	58	8.9
Delivery/Supply Trucks	29	4.5	3	0.5	7	1.1	0.4	0.1	1	0.1
Employee Vehicles	306	41.8	17	2.3	25	3.4	2	0.3	4	0.5
Miscellaneous Vehicles	72	10.9	5	0.8	5	0.8	0.4	0.1	1	0.1
TOTAL	2997	452.2	315	47.7	653	99.2	41	6.2	63	9.6

TABLE 20B
ELSMERE CANYON LANDFILL – TOTAL OPERATIONS EMISSIONS
MODELED EMISSIONS
Shifts 1 & 3

Activity	CO		ROC		NOx		SO2		PM10	
	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)
Combustion Emissions due to Equipment Operations										
Disposal Area	186.93	28.51	21.72	3.31	182.35	27.81	18.26	2.78	17.81	2.72
Wood/Green Waste Processing Facility	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt and Concrete Facility	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landfill Gas Flare	2399.04	437.82	145.35	26.53	846.72	154.53	268.13	48.93	804.38	146.80
Fugitive Emissions due to Equipment Operations										
Fuel Storage and Dispensing	N/A	N/A	0.14	0.03	N/A	N/A	N/A	N/A	N/A	N/A
Fugitive Dust Disposal Operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	25.19	4.59
Paved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	154.05	23.49
Unpaved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	106.21	10.43
Fugitive Landfill Gas	N/A	N/A	2951.39	538.63	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	2585.97	466.33	3118.61	568.49	1029.07	182.34	286.38	51.72	1107.65	188.03

TABLE 20B (CONCLUDED)
ELSMERE CANYON LANDFILL – TOTAL OPERATIONS EMISSIONS
MODELED EMISSIONS
Shift 2

Activity	CO		ROC		NOx		SO2		PM10	
	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)	Worst Case Daily (lb/day)	(ton/yr)
Combustion Emissions due to Equipment Operations										
Disposal Area	221.57	33.79	41.61	6.35	471.52	71.91	53.86	8.21	48.35	7.37
Wood/Green Waste Processing Facility	3.65	0.47	1.15	0.15	16.51	2.15	1.15	0.15	0.58	0.07
Asphalt and Concrete Facility	9.12	0.19	2.88	0.06	41.28	0.87	2.88	0.06	73.44	1.54
Landfill Gas Flare	1199.52	218.91	72.68	13.26	423.36	77.26	134.06	24.47	402.19	73.40
Fugitive Emissions due to Equipment Operations										
Fuel Storage and Dispensing	N/A	N/A	0.07	0.01	N/A	N/A	N/A	N/A	N/A	N/A
Fugitive Dust Disposal Operations	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	371.19	39.18
Paved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	462.16	70.48
Unpaved Haul Road Travel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	318.64	31.30
Fugitive Landfill Gas	N/A	N/A	1475.69	269.31	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL	1433.86	253.37	1594.09	289.15	952.67	152.18	191.95	32.89	1676.55	223.36

Table 21
Estimation of Odor Impacts
ESWMF

Sample Data of Ground Level Concentrations of Selected Organics from the Surface of a Class III Landfill

Toxics	Concentration Sample 1 ppm	Sample 2 ppm	Average ppm
Methane	11.48	4.58	8.03
Acetonitrile	0	0	0
Benzene	3.08	3.5	3.29
Benzylchloride	0	0	0
Chlorobenzene	0	0	0
Dichlorobenzene	0	0	0
1,1 Dichloroethane	0	0	0
1,2 Dichloroethane	0	0	0
1,1 Dichlorothylene	0	0	0
Dichloromethane	0.76	0.86	0.81
Perchloroethene	0.84	0.66	0.75
Carbon Tetrachloride	0.12	0.13	0.125
Toluene	6.44	7	6.72
1,1,1 Trichloroethene	2.92	2.98	2.95
Trichloroethene	0	0	0
Chloroform	0	0	0
Vinyl Chloride	0	0	0
MTP-Xylene	1.8	1.48	1.64
O-OXylenes	0.7	0.58	0.64

Source: BKK, 1993

Sampled Ground Level Concentrations of Odorus Compounds from a Class III Landfill

Isopropyl Mercaptan ppm	Methyl Mercaptan ppm	Ethyl Mercaptan ppm
0.4	2.4	0.59

Source: BKK, 1993

Fugitive Emission Rate Used in HRA

Landfill Area	Model Generated Benzene g/s/m2
1	7.48E-10
2	7.48E-10
3	7.48E-10
4	7.48E-10
5	7.48E-10
6	7.48E-10
7	7.48E-10
8	7.48E-10
9	7.48E-10
10	7.48E-10
11	7.48E-10
12	7.50E-10
13	7.50E-10
14	7.50E-10
15	7.50E-10
16	7.50E-10
17	7.50E-10
18	7.50E-10
19	7.50E-10
20	7.50E-10
21	7.50E-10
22	7.50E-10
23	7.48E-10
24	7.48E-10
25	7.50E-10
26	7.48E-10
27	7.50E-10
28	7.48E-10
29	7.48E-10
30	7.48E-10
31	7.48E-10
32	7.48E-10
33	7.48E-10
Average	7.49E-10

Concentrations	Model Generated Benzene Max. Exposed	Model Generated Benzene Res. D	Calculated Isopropyl Mercaptan Max. Exposed	Calculated Isopropyl Mercaptan Res. D	Calculated Methyl Mercaptan Max. Exposed	Calculated Methyl Mercaptan Res. D	Calculated Ethyl Mercaptan Max. Exposed	Calculated Ethyl Mercaptan Res. D
ug/m3	1.43E-02	2.95E-03	1.74E-03	3.59E-04	1.04E-02	2.15E-03	2.56E-03	5.29E-04
ppmv			5.422E-07	1.1E-07	5.1508E-06	1.1E-06	9.803E-07	2.0E-07
significance compared to 5			1.08E-03	2.24E-04	1.03E-02	2.13E-03	3.27E-03	6.74E-04

This Analysis Assumes:

1) Odors are dispersed in air similar to TACs
2) The estimated fugitive emission rate of Benzene is related to the measured ground level concentration by a linear proportionality constant.

3.29 ppm = Average benzene concentration measured

3) This proportionality constant can be used with the measured ground level concentrations to estimate an emission rate for the mercaptans.

4) Detection threshold for Isopropyl mercaptan is similar to Propyl mercaptan.

Table 22

COMPARITIVE EMISSION ANALYSIS OF ALTERNATIVES

LANDFILL OPERATIONAL EMISSIONS (tons/ year including flares)

	CO	ROC	NOx	SOx	Exhaust PM10	Fugitive PM10	Daily Capacity tons/day
ESWMF (from Table 6.2-4)	738	860	398	92	236	85	16,500
TOWSLEY CANYON	738	860	398	92	236	85	16,500
M-R-S CANYON	738	860	398	92	236	85	16,500
RAIL HAUL - Eagle Mountain (a)	322	184	731	110	161	65	20,000
RAIL HAUL - Bolo Station (b)	493	512	577	64	256	162	21,000
Smaller ESWMF case 1	515	525	265	63	166	51	10,000
Smaller ESWMF case 2	643	854	365	81	204	85	16,500
Larger ESWMF	1174	886	552	141	382	85	16,500

(a) Values from Table 27 and 28 page 90,91 of the Eagle Mountain 1992 DEIR/S Air Quality Appendix
(a) Values from Table 5.7.3 of the Bolo Station 1992 DEIR/S

WASTE TRUCK TRANSPORT EMISSIONS (tons per year)

	CO	ROC	NOx	SOx	Exhaust PM10	Haul Rd Fugitive PM10	Daily Capacity tons/day	Trucking Distance (a) miles OWT	On Site Haul Road miles OWT	Footprint Size acres
ESWMF	538	62	125	7.7	11.7	338	16,500	26	9.5	898
TOWSLEY CANYON	576	67	134	8.2	12.6	286	16,500	30	8.0	760
M-R-S CANYON	449	52	105	6.4	9.8	379	16,500	19	10.6	1005
RAIL HAUL - Eagle Mountain (b)	89	29	189	39.0	27.0	75	20,000	na	na	na
RAIL HAUL - Bolo Station (c)	19	4	33	2	5	0	21,000	na	na	na
Smaller ESWMF case 1	310	36	72	4.4	6.8	168	10,000	26	7.8	735
Smaller ESWMF case 2	511	59	119	7.3	11.2	277	16,500	26	7.8	735
Larger ESWMF	572	66	133	8.2	12.5	419	16,500	26	11.8	1111

(a) Trucking distance is measured from the waste centroid to the landfill entrance.
(b) Emissions reported for 200 trucks per day of local waste delivery, emissions not reported for delivery to the transfer stations.
(c) Emissions of truck delivery of liner materials, emissions not reported for truck delivery to the transfer stations.

TRANSFER STATION EMISSIONS (a)

	CO	ROC	NOx	SOx	Exhaust PM10
RAIL HAUL - Eagle Mt. and Bolo St.	98	30	325	40	35

(a) As per Eagle Mountain 1992 DEIR/S, Appendix E, Table 28, page 91.

RAIL TRANSPORT EMISSIONS (tons per year)

	CO	ROC	NOx	SOx	Exhaust PM10
RAIL HAUL - Eagle Mountain (a)	803	181	1986	277	56
RAIL HAUL - Bolo Station (b)	163	48	1230	88	27

(a) Nonmitigated Emissions estimates from the Eagle Mountain EIR/S
(b) Nonmitigated locomotive emissioms from the Bolo Station DEIR

Table 22

COMPARITIVE EMISSION ANALYSIS OF ALTERNATIVES

TOTAL TRANSPORT EXHAUST EMISSIONS (tons per year)

	CO	ROC	NOx	SOx	Exhaust PM10
ESWMF	538	62	125	8	12
TOWSLEY CANYON	576	67	134	8	13
M-R-S CANYON	449	52	105	6	10
RAIL HAUL - Eagle Mountain (a)	990	240	2500	356	118
RAIL HAUL - Bolo Station (a)	280	82	1588	130	67
Smaller ESWMF case 1	310	36	72	4	7
Smaller ESWMF case 2	511	59	119	7	11
Larger ESWMF	572	66	133	8	12

(a) Includes Transfer Station operational emissions.

TOTAL EMISSIONS FOR EACH ALTERNATIVE (tons per year)

	CO	ROC	NOx	SOx	Exhaust PM10	Fugitive PM10	Total PM10
ESWMF	1276	922	523	100	248	423	671
TOWSLEY CANYON	1314	927	532	100	249	371	620
M-R-S CANYON	1187	912	503	98	246	463	709
RAIL HAUL - Eagle Mountain	1312	424	3231	466	279	140	419
RAIL HAUL - Bolo Station	772	594	2164	194	323	162	485
Smaller ESWMF case 1	825	561	338	68	173	219	392
Smaller ESWMF case 2	1155	913	484	89	216	361	577
Larger ESWMF	1746	953	685	149	395	503	898

TOTAL ANNUAL EMISSIONS PER UNIT DAILY CAPACITY (tons per year)/(daily 1000 ton capacity)

	CO	ROC	NOx	SOx	Total PM10	Capacity tons/day
ESWMF	77	56	32	6	15	16.5
TOWSLEY CANYON	80	56	32	6	15	16.5
M-R-S CANYON	72	55	30	6	15	16.5
RAIL HAUL - Eagle Mountain	66	21	162	23	14	20.0
RAIL HAUL - Bolo Station	37	28	103	9	15	21.0
Smaller ESWMF case 1	82	56	34	7	17	10.0
Smaller ESWMF case 2	70	55	29	5	13	16.5
Larger ESWMF	106	58	42	9	24	16.5

Table 22A
Landfill Gas Combustion Emissions
For Alternative Sizes
ESWMF

Equipment	Amount	Heat Content BTU/scf	Design Capacity scfm	Heat Rate MMBTU/hr	EMISSIONS (lb/day) CO	ROG	NOx	SOx	PM10	EMISSION FACTORS (lb/MMBTU) CO (a)	ROG (b)	NOx (c)	SOx (d)	PM10 (e)
Smaller Case 1	7	350	4200	625	2551.96	154.62	900.69	285.22	855.66	0.17	0.0103	0.06	0.019	0.057
Annual Emissions: (tons)					465.73	28.22	164.38	52.05	156.16					
Smaller Case 2	9	350	4200	755	3078.53	186.52	1086.54	344.07	1032.21	0.17	0.0103	0.06	0.019	0.057
Annual Emissions: (tons)					561.83	34.04	198.29	62.79	188.38					
Larger	17	350	4200	1468	5988.08	362.81	2113.44	669.26	2007.77	0.17	0.0103	0.06	0.019	0.057
Annual Emissions: (tons)					1092.82	66.21	385.70	122.14	366.42					

(a) Average of CO emission factor range of 0.05 – 0.29 lb/MMBtu (Personal communication, Jay Chen, SCAQMD, 1992)
(b) Derived from raw gas analysis results (92.3% of NMOC = ROG, Radian, 1992) and assumption of 98% ROG destruction efficiency (Personal communication, Jay Chen, SCAQMD, 1992)
(c) SCAQMD Best Available Control Technology (SCAQMD, 1990)
(d) Derived from SCAQMD Rule 431.1 (Personal communication, Jay Chen, SCAQMD, 1992)
(e) Derived from SCAQMD BACT determination for PM10 (draft) = 20lb PM10/MMcf (Personal communication, Jay Chen, SCAQMD, 1992)

Table 23
Assessment of Average Train and Truck Travel for Rail Haul Alternatives

Potential Transfer Station	Truck Distance from Centroid	Train Distance from Basset Station
Commerce	8	15
El Segundo	18	35
Carson	16	30
Puente Hills	13	22
Irwindale	15	0
LaVerne	28	−8
Industry	18	0
Average	17	13

TABLE 1-M
ELSMERE CANYON LANDFILL - CONSTRUCTION EQUIPMENT EMISSIONS
MITIGATED EMISSIONS
OFF-RAMP

Duration = 290 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Compressors	2	8	4.22	0.77	6.91	0.77	0.38	COMPRESSOR (b)	0.011	0.002	0.018	0.002	0.001
Loader	1	8	4.58	1.84	15.20	1.46	1.36	WHEELED LOADER	0.57	0.23	1.90	0.18	0.17
Gunnite Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Concrete Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Transit Mix	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Service Trucks	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Crane	3	8	16.20	3.60	40.80	3.43	3.36	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Generator	2	8	6.51	1.18	10.66	1.18	1.18	GENERATOR < 50 hp (b)	0.011	0.002	0.018	0.002	0.002
Asphalt Paver	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Water trucks (c)(d)	1	8	5.87	0.63	1.39	0.08	0.13	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Tamper	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Auger/Fill Unit	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Lane Striper (c)(d)	1	8	5.87	0.63	1.39	0.08	0.13	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Wheel Tractor	1	8	28.64	1.44	10.16	0.72	1.12	WHEELED TRACTOR	3.58	0.18	1.27	0.09	0.14
Off-Hwy Truck (c)(d)	6	8	35.22	3.76	8.32	0.51	0.81	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Street Sweeper (c)(d)	1	8	5.87	0.63	1.39	0.08	0.13	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Forklift	1	8	4.16	1.36	12.32	2.80	0.74	FORK LIFT - 175 hp	0.52	0.17	1.54	0.35	0.093
Backhoe	2	8	5.60	1.92	20.16	2.24	1.79	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
	Worst Case Daily Totals (lbs)		184.15	30.75	283.37	26.01	23.97						
	Total Quarterly Emissions (tons)		5.98	1.00	9.21	0.85	0.78						

a) SCAQMD CEQA Handbook, April 1993, Tables A9-8A & A9-8B
b) Emission factor is lb/hp-hr
c) SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L
d) Mitigation measure assumes onroad engines at 15 mph (max. speed on site), and running exhaust and evaporative only

TABLE 2-M
ELSMERE CANYON LANDFILL - CONSTRUCTION EQUIPMENT EMISSIONS
MITIGATED EMISSIONS
ACCESS ROAD

Duration = 171 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Transit Mix	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Concrete Pump	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Asphalt Paver	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Side boom	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Grader	2	8	2.42	0.62	0.86	1.38	0.98	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Scrapers	23	8	230.00	49.68	706.56	84.64	75.44	SCRAPER	1.25	0.27	3.84	0.46	0.41
Dozers	7	8	19.60	6.72	70.56	7.84	6.27	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Water trucks (b)(c)	3	8	17.61	1.88	4.16	0.25	0.40	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Roller -	2	8	4.80	1.04	13.92	1.07	0.80	ROLLER	0.30	0.07	0.87	0.07	0.05
Steel Wheeled Loader	1	8	1.61	0.76	6.64	0.61	0.47	TRACK-TYPE LOADER	0.20	0.10	0.83	0.08	0.06
	Worst Case Daily Totals:(lbs)		286.84	63.10	829.90	98.08	86.60						
	Total Quarterly Emissions:(tons)		9.32	2.05	26.97	3.19	2.81						

a) SCAQMD CEQA Handbook, April 1993, Tables A9-8A & A9-8B
b) SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L
c) Mitigation measure assumes onroad engines at 15 mph (max. speed on site), and running exhaust and evaporative only

Elemit02.wk3, 30-August-94

TABLE 4-M
ELSMERE CANYON LANDFILL – CONSTRUCTION EQUIPMENT EMISSIONS
MITIGATED EMISSIONS
SEWER AND TRANSMISSION LINES

Duration = 236 working days (65 working days/quarter)

ON SITE EQUIPMENT	QUANTITY	DAILY USAGE (HRS/DAY)	EMISSIONS (lb/day) CO	ROC	NOx	SOx	PM10	SCAQMD CEQA HANDBOOK CATEGORY (a)	EMISSION FACTORS (lb/hr) CO	ROC	NOx	SOx	PM10
Backhoe	4	8	11.20	3.84	40.32	4.48	3.58	TRACK-TYPE TRACTOR	0.35	0.12	1.26	0.14	0.11
Grader	1	8	1.21	0.31	0.43	0.69	0.49	MOTOR GRADER	0.15	0.04	0.05	0.09	0.06
Transit Mix	5	8	27.00	6.00	68.00	5.72	5.60	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Dump Truck (c)(d)	5	8	29.35	3.13	6.93	0.42	0.67	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Asphalt Paver	2	8	10.80	2.40	27.20	2.29	2.24	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Water trucks (c)(d)	2	8	11.74	1.25	2.77	0.17	0.27	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Tamper	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Lane Striper (c)(d)	1	8	5.87	0.63	1.39	0.08	0.13	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Sideboom	3	8	16.20	3.60	40.80	3.43	3.36	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Roller	1	8	2.40	0.52	6.96	0.54	0.40	ROLLER	0.3	0.065	0.87	0.067	0.05
Trencher	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Off-Hwy Truck (c)(d)	1	8	5.87	0.63	1.39	0.08	0.13	TRUCKS: ON HIGHWAY	0.73	0.08	0.17	0.01	0.02
Service Truck	4	8	21.60	4.80	54.40	4.58	4.48	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
Compressor	3	8	6.34	1.15	10.37	1.15	0.58	COMPRESSOR (b)	0.011	0.002	0.018	0.002	0.001
Loader	1	8	4.58	1.84	15.20	1.46	1.36	WHEELED LOADER	0.57	0.23	1.90	0.18	0.17
Bending Machine	1	8	5.40	1.20	13.60	1.14	1.12	MISCELLANEOUS-DIESEL	0.68	0.15	1.70	0.14	0.14
	Worst Case Daily Totals:(lbs)		157.95	29.55	276.20	23.35	22.59						
	Total Quarterly Emissions:(tons)		5.13	0.96	8.98	0.76	0.73						

a) SCAQMD CEQA Handbook, April 1993, Tables A9-8A & A9-8B
b) Emission factor is lb/hp-hr
c) SCAQMD CEQA Handbook, April 1993, Tables A9-5-K-4 and A9-5-L
d) Mitigation measure assumes onroad engines at 15 mph (max. speed on site), and running exhaust and evaporative only

TABLE 6–M
MITIGATED CONSTRUCTION SOIL DISTURBANCE PM10 EMISSIONS

CONSTRUCTION ACTIVITY (a)	No. of Equipment	hours per day	VMT/day	Area (a) (acres)	Days of Construction	Emission Factor (b) Units	PM10 (lbs/day)
Grading							
Offramp				18.0	113.4	8.4 lbs/acre day	1.3
Support Facilities				14.8	58.38	8.4 lbs/acre day	2.1
Dirt Pushing (dozers)	7	8				0.4 lbs/hr	23.3
Earth Moving (scrappers)	23		80			0.6 lbs/VMT	1186.8
PM10 FROM CONSTRUCTION ACTIVITIES (lbs/day) (d) =							1212.2
PM10 FROM CONSTRUCTION ACTIVITIES (tons/Qtr) (c)(e) =							39.4

(a) Acres per day determined by total acres per area to be cleared, and graded divided by the number of days.

(b) SCAQMD CEQA Air Quality Handbook, Table A9–9 (SCAQMD 1993), mitigated as shown in Table 17.

(c) Based upon 65 construction days per quarter.

(d) The grading of the offramp and the support facilities would occur during the same worst case quarter. The worst case daily emissions include the highest daily emissions and the dirt pushing and earthmoving daily emissions.

(e) The offramp grading would occur during 2/3 of the worst case construction quarter and then is predicted to move to the support facilities for the rest of the quarter. Therefore, the tons per quarter for grading operations are represented by 2/3 of the offramp emissions and 1/3 of the support facilities emissions and the dirt pushing and earthmoving emissions for a period of 65 days.

APPENDIX D

Table 7-M

TRANSMISSION CONSTRUCTION SOIL DISTURBANCE
FUGITIVE PM10 EMISSIONS

SOURCE	DIRT REMOVED FT3	DIRT BACKFILLED FT3	DIRT HAULED FT3	DIRT STOCKPILED FT3	PIPELINE HAULED	NUMBER OF DAYS	EMISSIONS LBS/DAY
Modified Grading	36000.00					335	0.07
Storage Pile				34603.73		335	0.05
Trench Backfilling		34603.73				335	0.12
Truck Loading (a)			0.00			335	0.00
Dirt Hauling (a)			0.00			335	0.00
Pipeline Delivery (b)					1396.27	335	0.12
Dirt Dumping (a)			0.00			335	0.00
				TOTAL PM10 LB/DAY			0.36
				TOTAL PM10 TONS/QTR			0.01

(a) Assumes all excavated dirt will be compacted into the trench
(b) Assumes clean road and one way trip

VOLUME OF DIRT - OPTION A2

SOURCE	LENGTH ft	WIDTH ft	DEPTH ft	DIAMETER (e) ft	VOLUME ft3	VOLUME yd3
Trench	4000	3.00	3.00		36000.00	1333.33
Pipeline	4000			0.67	1396.27	51.71

EMISSION FACTORS

SOURCE	LB/FT3 (c)
Modified Grading (a)	0.00061
Storage Pile (a)	0.000491
Trench Backfilling (a)	0.0012
Truck Loading (a)	0.000557
Dirt Hauling (b)	0.000
Pipeline Delivery (b)	0.029631
Dirt Dumping (a)	0.0005

Source	miles/trip	Number Vehicles (d)	one-way trips	VMT
Haul Truck	0	5.17	2	0.00
Pipe Truck	10	5.17	2	103.43

(a) Mitigated emission factors supplied by Shalini George of the SCAQMD 2/19/93
(b) Mitigated emission factors supplied by Shalini George of the SCAQMD 2/19/93 was modified for miles/trip
(c) Assumes soil density of 2935 lb/yd3
(d) Assumes 10 yd3 of pipe or dirt/truck trip and unpaved road travel 23 lb/VMT
(e) Assumes that the conduit is 8" diameter.

Table 8-M

SEWER CONSTRUCTION SOIL DISTURBANCE
FUGITIVE PM10 EMISSIONS

SOURCE	DIRT REMOVED FT3	DIRT BACKFILLED FT3	DIRT HAULED FT3	DIRT STOCKPILED FT3	PIPELINE HAULED	NUMBER OF DAYS	EMISSIONS LBS/DAY
Modified Grading (c)	45173.33					335	0.08
Storage Pile (d)				42593.03		335	0.06
Trench Backfilling (e)		42593.03				335	0.15
Truck Loading (a)			0.00			335	0.00
Dirt Hauling (a)			0.00			335	0.00
Pipeline Delivery (b)					2580.30	335	0.23
Dirt Dumping (a)			0.00			335	0.00
				TOTAL PM10 LB/DAY			0.53
				TOTAL PM10 TONS/QTR			0.02

(a) Assumes all excavated dirt will be compacted into the trench
(b) Assumes clean road and one way trip

VOLUME OF DIRT

SOURCE	LENGTH ft	WIDTH (e) ft	DEPTH(f) ft	DIAMETER ft	VOLUME ft3	VOLUME yd3
Trench	7392	1.67	3.67		45173.33	1673.09
Pipeline	7392			0.67	2580.30	95.57

EMISSION FACTORS

SOURCE	LB/FT3 (c)
Modified Grading (a)	0.00061
Storage Pile (a)	0.000491
Trench Backfilling (a)	0.0012
Truck Loading (a)	0.000557
Dirt Hauling (b)	0.000
Pipeline Delivery (b)	0.029631
Dirt Dumping (a)	0.0005

Source	miles/trip	Number Vehicles (d)	one-way trips	VMT
Haul Truck	0	9.56	2	0.00
Pipe Truck	10	9.56	2	191.13

(a) Mitigated emission factors supplied by Shalini George of the SCAQMD 2/19/93
(b) Mitigated emission factors supplied by Shalini George of the SCAQMD 2/19/93 was modified for miles/trip
(c) Assumes soil density of 2935 lb/yd3
(d) Assumes 10 yd3 of pipe or dirt/truck trip and unpaved road travel 23 lb/VMT
(e) Assumes an additional 6 inches past the diameter of pipe
(f) Assumes 30 inches below grade + 6 inches past the diameter of the pipe

TABLE 18-M
ELSMERE CANYON LANDFILL - LANDFILL USER EMISSIONS

User Vehicle	Idle Time (min/OWT)(a)	Vehicles Per Day(b)	Inside Site Avg. Miles (mi/RT)	Outside Site Avg. Miles (mi/RT)	WORST CASE DAILY TOTAL EMISSIONS (lb/day)(d) ROC	NOx	SO2	CO	PM
Refuse Transfer Truck (c)(e)	10	525	8.51	26	94.65	232.83	14.63	798.93	22.22
Refuse Collection Truck(c)	10	619	8.51	40	130.90	362.97	23.37	1106.85	35.94
Miscellaneous Vehicles	10	121	5	20	5.44	5.21	0.40	71.74	0.70
Delivery/Supply Trucks(c)	10	15	5	30	2.56	6.66	0.42	21.39	0.64
Annual Emissions (tons)					35.62	92.67	5.92	304.83	9.08

(a) OWT = one-way trip
(b) Number of vehicle round trips is based on number of daily vehicles making one round trip per day
Mileages are estimates
(c) Total emissions include moving truck and idle truck emissions
(d) SCAQMD CEQA Handbook, April 1993, Tables A9-5-J-4 and A9-5-L
(e) The mileage is based on the maximum marginal distance from the waste centroid to the project as compared to other waste disposal facilities

MISCELLANEOUS VEHICLE EMISSION FACTORS

Mode		ROC	NOx	SO2(b)	CO	PM
Running exhaust (w/o site) (g/mile)	(a)	0.25	0.62	0.06	6.83	0.11
Running exhaust (w/i site) (g/mile)	(c)	0.61	0.68	0.06	8.86	0.11
Cold start (g/vehicle)	(a)	4.34	2.54	N/A	79.08	N/A
Hot start (g/vehicle)	(a)	0.87	1.19	N/A	8.95	N/A
Hot soak (g/vehicle)	(a)	1.88	N/A	N/A	N/A	N/A
Diurnal (g/vehicle)	(a)	5.26	N/A	N/A	N/A	N/A

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-J-4, Area 2
- Average speed of 20 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6000 lbs or less including light automobiles, light duty trucks, vans, station wagons and 4x4 trucks
- Average trips/vehicle = 2 (1 RT)
- Passenger vehicles: 52.85% CS and 47.15% HS
- PM include exhaust particulates and tire wear

(b) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-L

(c) – Within property boundaries at 15 mph

TRUCK COLLECTION/TRANSPORT EMISSION FACTORS

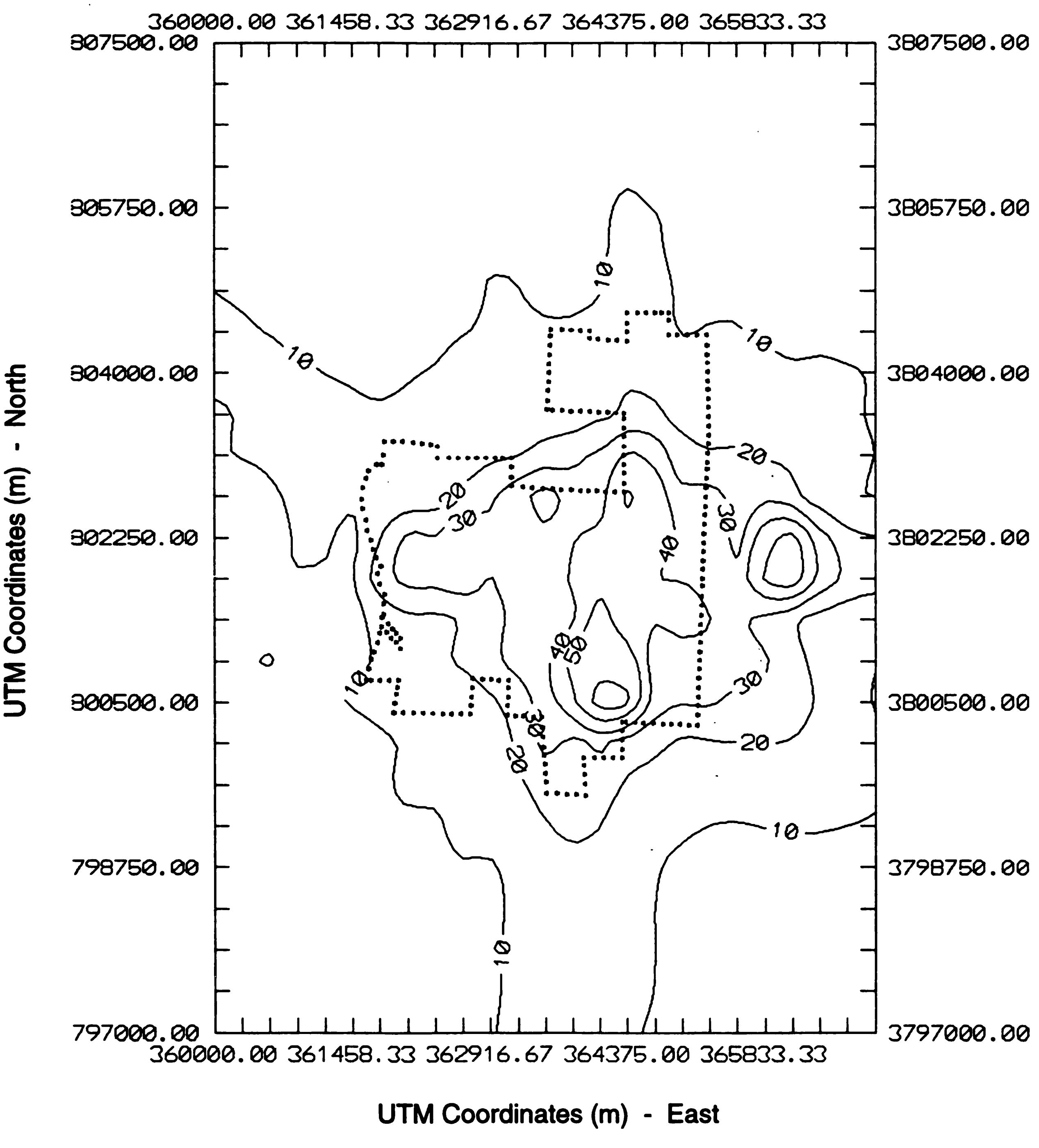
Mode		ROC	NOx	SO2(b)	CO	PM(c)
Running exhaust (w/o site) (g/mile)	(a)	1.01	4.63	0.32	8.63	0.51
Running exhaust (w/i site) (g/mile)	(d)	2.37	5.24	0.32	22.19	0.51
Cold start (g/vehicle/day)	(a)	2.55	1.99	N/A	37.55	N/A
Hot start (g/vehicle/day)	(a)	0.00	1.00	N/A	4.10	N/A
Hot soak (g/vehicle/day)	(a)	1.48	N/A	N/A	N/A	N/A
Diurnal (g/vehicle/day)	(a)	5.32	N/A	N/A	N/A	N/A
Idle (g/min) (c)		1.26	1.66	0.08	11.77	0.08

(a) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4, Area 2
- Average speed of 40 mph for NOx and CO
- Average speed of 35 mph for ROG
- Vehicles with gross vehicle weight 6001 lbs and up including medium-duty and light/heavy-duty, medium/heavy-duty and heavy/heavy-duty vehicles
- Average trips/vehicle = 2 (1 RT)
- Trucks: 50.07% CS and 49.93% HS
- PM emissions include exhaust particulates and tire wear

(b) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-L

(c) – Based on:
- SCAQMD CEQA Handbook, April 1993, Table A9-5-K-4
- 5 mph for running exhaust and evaporative
- 10 minutes idle time per day
- PM10 emissions are exhaust only

(d) – Within property boundaries at 15 mph



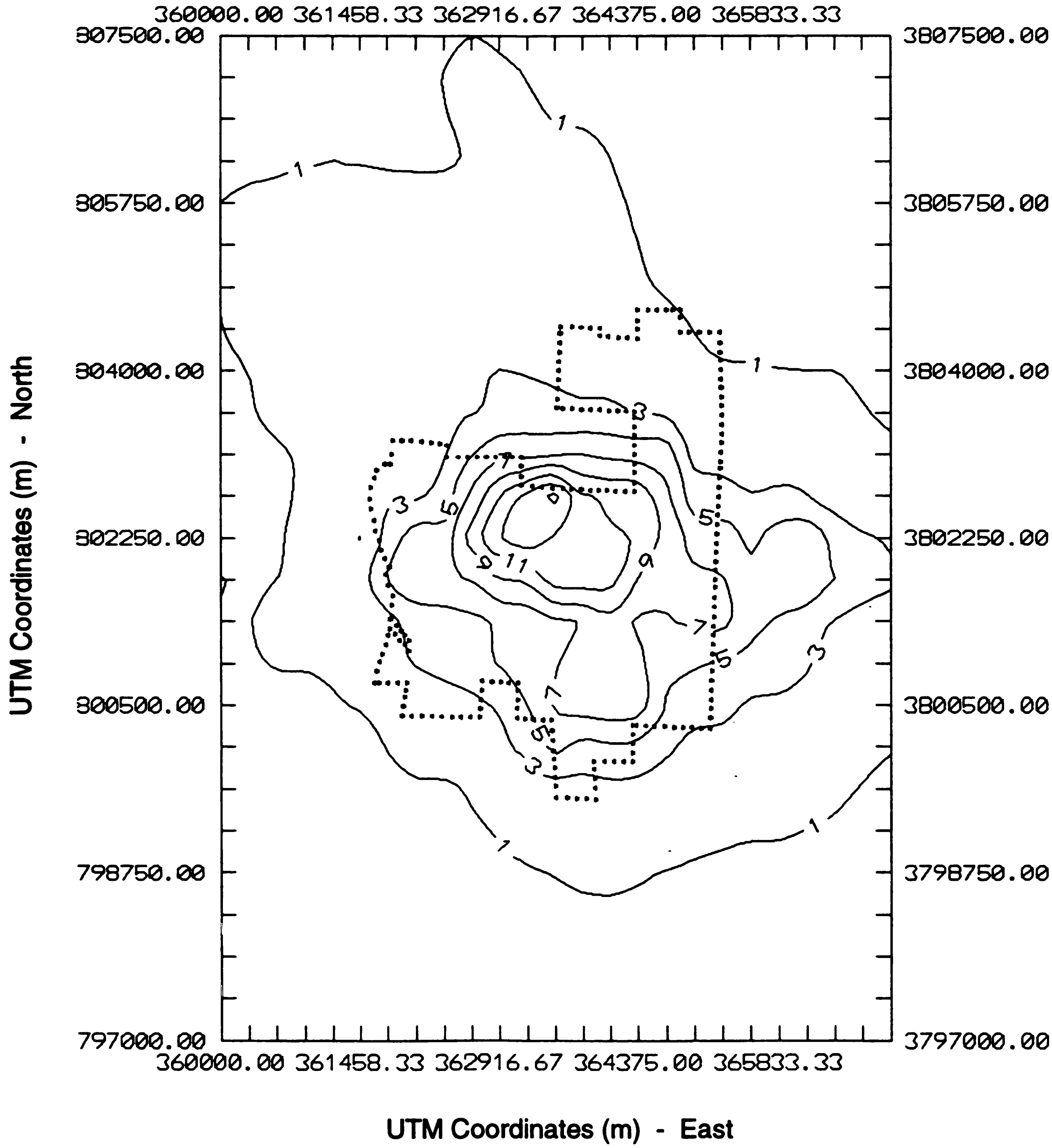
Dames & Moore

ELSMERE SWMF

Figure D-1

24-HOUR AVERAGE PM10 IMPACTS (μ/m³)

APPENDIX D



Dames & Moore

ELSMERE SWMF

Figure D-2

ANNUAL AVERAGE PM10 IMPACTS (μ/m³)

MODEL INPUT FILES FOR THE ELSMERE SOLID WASTE MANAGEMENT FACILITY

The printouts in this document are the input files used in the air dispersion modeling analysis for the operational emissions of the proposed Elsmere Solid Waste Management Facility (ESWMF). The file printouts are presented in sections for each emission source group.

Each Source Group Section includes one source file, two run files, and two optional run files. The run and optional run files are for two time periods of different emission rates. One run for Shift 2 (files with a number "2" in the name), and one for Shifts 1 and 3 (files with the number "13" in the name).

These are the Source Groups:

- Ancillary Pad
- Flare
- Landfill Construction Equipment
- Landfill User Traffic
- Paved Haul Road
- Unpaved Haul Road

A separate section is included which contains the receptor input file used for all model runs.

The last section includes the input files used by the post processing program to multiply the respective source emission rate by the normalized dispersion coefficient and combine this product for all of the sources at each receptor, each pollutant, and each hour. The post processor calculates and identifies the maximum concentration of each pollutant for various averaging times at each receptor.

ESWMF IGM MODEL INPUT FILES

ANCILLARY PAD

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

```
BKK- Elsmere Proposed Landfill
                |***************************************|
                |       FILE SPECIFICATION SECTION     *|
                |***************************************|
Fa--------------------------------------|
bkkels13.txt                            * I REQ Meteorological data input file
elsmere.rec                             * I REQ Receptor file
elsanc.SRI                              * I REQ Source file
elsanc13.RNO                            * I OPT Optional run file
n/a                                     * I OPT Terrain profiles (REQ for RTDM)
elsanc13.OFP                            * O REQ Output print file - ASCII
n/a                                     * O OPT Type C disk output - binary
n/a                                     * O OPT Detailed report file - ASCII
n/a                                     * O OPT Processed conc. output - binary
                |***************************************|
                |       GENERAL RUN SET-UP SECTION     *|
                |***************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-character Run i.d.
                |***************************************|
                |        PRINTOUT CONTROL SECTION      *|
                |***************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprsrc     "     "  detailed source data        y(1) n(0)
      0  ispdmo      "     "  model tech options          y(1) n(0)
      0  isprsd      "     "  source/rec min. dist        y(1) n(0)
      0  isperg      "     "  src groups/totals summ      y(1) n(0)
      0  isppht      "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispins      "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                |***************************************|
                |     POST-PROCESSING OPTIONS SECTION   |
                |***************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |***************************************|
                |*   AVERAGING TIMES OPTIONS SECTION   *|
                |***************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)    N-hi (0=no Type D)
                |***************************************|
                |*       MODEL SELECTION SECTION       *|
                |***************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                     *|
|*                   -irpro must be non-0;                                   *|
|*                   -must create profile file;                              *|
|*                   -must assign profiles in source file;                   *|
|*                                                                           *|
|*Reg Def Models  1 = ISCST2 Rural                                  P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)            P A V *|
|* source types    3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point        4 = COMPLEX-I (Rural)                             P     *|
|*  A=area         5 = RTDM Default                                  P     *|
|*  V=volume       6 = SHORTZ Default                                P     *|
|*                                                                           *|
                |***************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION  *|
                |***************************************|
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
```

```
  190.00 bsmetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |*****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |*****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1  0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |*****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS  *|
               |*****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |*****************************************|
               |*        ANALYSIS SCOPE SECTION         *|
               |*        SOURCE GROUPS & TOTALS         *|
               |*****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |*****************************************|
               |*    Source Group Selection Section    *|
               |*****************************************|

|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.      one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |*****************************************|
               |*          Group Totals Section          *|
               |*            (ngtots lines)              *|
               |*****************************************|

|
|                                      num-  Group numbers that define total      |
|         Total Name(s)                num   (max. 99-enter numnum/10 lines)      |
Va-------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|---|

               |*****************************************|
               |*    CONC. THRESHOLD-BASED SECTION      *|
               |*              (TYPE C)                 *|
               |*        (numcsc cases/blocks)          *|
               |*****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                    (1)-To create a summary ("significant impact") report that is
                        based on both concentration sums exceeding the applicable
                        threshold criteria. Concentrations written to the "Type C"
                        file, and in the detailed report (if selected), are based
                        on meeting the first threshold criterion only
                    (2)-To limit concentrations written to file, and in the
                        detailed report (if selected), to only those that meet
                        both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

BKK- Elsmere Proposed Landfill

```
                    |****************************************|
                    |       FILE SPECIFICATION SECTION     *|
                    |****************************************|
Fa-----------------------------------|
bkkels2.txt                          * I REQ Meteorological data input file
elsmere.rec                          * I REQ Receptor file
elsanc.SRI                           * I REQ Source file
elsanc2.RNO                          * I OPT Optional run file
n/a                                  * I OPT Terrain profiles (REQ for RTDM)
elsanc2.OFP                          * O REQ Output print file - ASCII
n/a                                  * O OPT Type C disk output - binary
n/a                                  * O OPT Detailed report file - ASCII
n/a                                  * O OPT Processed conc. output - binary
                    |****************************************|
                    |       GENERAL RUN SET-UP SECTION     *|
                    |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
  Elsmere Landfill       :24-character Run i.d.
                    |****************************************|
                    |       PRINTOUT CONTROL SECTION       *|
                    |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprc      "     "  detailed source data         y(1) n(0)
      0  ispdmo     "     "  model tech options           y(1) n(0)
      0  isprsd     "     "  source/rec min. dist         y(1) n(0)
      0  isperg     "     "  src groups/totals summ       y(1) n(0)
      0  isppht     "     "  plume height/Hcrit tables    y(1) n(0)
      0  ispins     "     "  interm terr summary report   y(1) n(0)
      1  ipgc    PC(1) or mainfrsme(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                    |****************************************|
                    |     POST-PROCESSING OPTIONS SECTION     |
                    |****************************************|
Fi-----|
      0  iopdo   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                    |****************************************|
                    |*   AVERAGING TIMES OPTIONS SECTION   *|
                    |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                    |****************************************|
                    |*        MODEL SELECTION SECTION      *|
                    |****************************************|
Fi-----|
      1  ipmod   Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod   Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro   Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*            If RTDM (5) selected:                                          *|
|*              -irpro must be non-0;                                        *|
|*              -must create profile file;                                   *|
|*              -must assign profiles in source file;                        *|
|*                                                                           *|
|*Reg Def Models  1 = ISCST2 Rural                                     P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)              P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                                P     *|
|*  A=area        5 = RTDM Default                                     P     *|
|*  V=volume      6 = SHORTZ Default                                   P     *|
|*                                                                           *|
                    |****************************************|
                    |* METEOROLOGICAL DATA FORMAT SECTION  *|
                    |****************************************|
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
```

```
  190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
                 |*****************************************|
                 |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
                 |*****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1  0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
                 |*****************************************|
                 |*  ANALYSIS SCOPE SECTION: RECEPTORS  *|
                 |*****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
                 |*****************************************|
                 |*       ANALYSIS SCOPE SECTION          *|
                 |*       SOURCE GROUPS & TOTALS          *|
                 |*****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
                 |*****************************************|
                 |*    Source Group Selection Section    *|
                 |*****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.    i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
                 |*****************************************|
                 |*          Group Totals Section         *|
                 |*           (ngtots lines)              *|
                 |*****************************************|
|
|                                  num-  Group numbers that define total      |
|         Total Name(s)            num   (max. 99-enter numnum/10 lines)      |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

                 |*****************************************|
                 |*    CONC. THRESHOLD-BASED SECTION     *|
                 |*              (TYPE C)                 *|
                 |*        (numcsc cases/blocks)          *|
                 |*****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributione in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentratione written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
  0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
  0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
Otional Run File - Elsmere Landfill
            |****************************************|
            |*      FILE SPECIFICATION SECTION      *|
            |****************************************|
Fa------------------------------------|
n/a                                    * I OPT Hourly chi (surr src) file
n/a                                    * I OPT Hourly source data input file
elsanc13.SEQ                           * O OPT Sequential output file
n/a                                    * O OPT Debug Output file
            |****************************************|
            |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
            |****************************************|
Fi-----|
       1  iopdsq  Sequential output? n(0) y-concentratione(1) y-detailed(2)
       0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
       1  jdstr   jdy start debug/sequential output
       1  ihstr   ihr start debug/sequential output
     366  jdstp   jdy stop debug/sequential output
      24  ihstp   ihr stop debug/sequential output
       0  isnsq   Source number for debug/sequential output (0=all sources)
       0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
       0  iprndx  Printout index calculations y(1) n(0)
            |****************************************|
            |*      SOURCE-SPECIFIC MET DATA        *|
            |*         AND MODEL SECTION            *|
            |****************************************|
Fi-----|
       0  modset  Use algorithm sets and assign at source level y(1) n(0)
       0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
            |****************************************|
            |*        Source-Specific (IGM)         *|
            |*     Meteorological Data Section      *|
            |****************************************|
Fi-----|
       7  nfield  (IGM format) met data input, number of fields
       0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
       0  nlvpro  ws/wd profiles: number of levels
       0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
     0.0  stpro   ws/wd profiles: height of first profile level (m)
     0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
    100.    100.    100.    100.    100.    100.     10.     10.  htmets
     wsclm : wind speed threshold (for calm def.)
     htmets: height of wind spd measurement (meters)
            |****************************************|
            |*           Source-Specific            *|
            |*   Regulatory Default Model Section   *|
            |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                  4=COMPLEX-I  5=RTDM  6=SHORTZ
            |****************************************|-->This section used if reg
            |*           Source-Specific            *|   def=0 or to override reg
            |*     User-Defined Model Section       *|   def w/neg # (-999 = 0)
            |****************************************|
Fa------------------------------------|
                                       :1    User-defined description of
                                       :2    model algorithm sets
                                       :3
                                       :4
                                       :5    Those 40-character descriptions
                                       :6    are informational only and may
                                       :7    be left blank
                                       :8

| General technical options       |
Fi-|---|---|---|---|---|---|---|---|
```

```
  0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
  0   0   0   0   0   0   0   0  istpd   Stack-tip dwssh: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
  0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
  0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
  0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
  0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
  0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
  0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
  0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
  0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
  0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
  0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
  0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
  0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
  0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
  0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
  0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
  0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
  0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
  0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
  0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
  0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
  0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
  0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
  0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
  0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
  0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
  0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
  0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
  0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
  0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmins
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
TAF D  Terrain adjustment factor-Stability D
TAF E  Terrain adjustment factor-Stability E
TAF F  Terrain adjustment factor-Stability F
xmina  Minimum approach (meters)
xwnu   Cross sector width (n/u)
xws    Cross sector width (stable)
alpha  Parameter for BID
xmnscl Minimum height to scale to
zvfac  Factor to calc xz (1.169 is exact)
xmxmin minimum mixing height, meters (0.0=no modification)
halflf pollutant half-life in seconds (0.0=no pollutant decay)
               |*****************************************|
               |*      OPTIONAL P & PTG SECTION         *|
               |*****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00     A
   0.00    0.00    0.00    0.00    0.00    0.00     B
   0.00    0.00    0.00    0.00    0.00    0.00     C    :PDEF1
   0.00    0.00    0.00    0.00    0.00    0.00     D     iopp=11
   0.00    0.00    0.00    0.00    0.00    0.00     E
   0.00    0.00    0.00    0.00    0.00    0.00     F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00     A
   0.00    0.00    0.00    0.00    0.00    0.00     B
   0.00    0.00    0.00    0.00    0.00    0.00     C    :PDEF2
   0.00    0.00    0.00    0.00    0.00    0.00     D     iopp=12
   0.00    0.00    0.00    0.00    0.00    0.00     E
   0.00    0.00    0.00    0.00    0.00    0.00     F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00     A
   0.00    0.00    0.00    0.00    0.00    0.00     B
   0.00    0.00    0.00    0.00    0.00    0.00     C    :PDEF3
   0.00    0.00    0.00    0.00    0.00    0.00     D     iopp=13
   0.00    0.00    0.00    0.00    0.00    0.00     E
   0.00    0.00    0.00    0.00    0.00    0.00     F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000     A
   .000    .000    .000    .000    .000    .000     B
   .000    .000    .000    .000    .000    .000     C    :DTHDEF1
   .000    .000    .000    .000    .000    .000     D     iopdth=11
   .000    .000    .000    .000    .000    .000     E
   .000    .000    .000    .000    .000    .000     F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000     A
   .000    .000    .000    .000    .000    .000     B
   .000    .000    .000    .000    .000    .000     C    :DTHDEF2
   .000    .000    .000    .000    .000    .000     D     iopdth=12
   .000    .000    .000    .000    .000    .000     E
   .000    .000    .000    .000    .000    .000     F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000     A
   .000    .000    .000    .000    .000    .000     B
   .000    .000    .000    .000    .000    .000     C    :DTHDEF3
   .000    .000    .000    .000    .000    .000     D     iopdth=13
   .000    .000    .000    .000    .000    .000     E
   .000    .000    .000    .000    .000    .000     F
               |*****************************************|
               |*      HOURLY SOURCE DATA SECTION       *|
               |*****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
               |*****************************************|
               |*    OZONE LIMITING METHOD SECTION      *|
               |*****************************************|
Fi-----|
       0  iepolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
               |*****************************************|
               |*  HOURLY CHI/SURROGATE SOURCE SECTION  *|
               |*****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
   0    0  (Surr src name)
           |*****************************************|
           |* CONCENTRATION CHECK (CHICHK) SECTION *|
           |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
Otional Run File - Elsmere Landfill
               |****************************************|
               |*      FILE SPECIFICATION SECTION      *|
               |****************************************|
Fa-------------------------------------|
n/a                                     * I OPT Hourly chi (surr src) file
n/a                                     * I OPT Hourly source data input file
elsanc2.SEQ                             * O OPT Sequential output file
n/a                                     * O OPT Debug Output file
               |****************************************|
               |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
               |****************************************|
Fi-----|
       1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
       0  idbug   Debug? 0=no, 1=hour, 2=source, 3=recoptor level
       1  jdstr   jdy start debug/sequential output
       1  ihstr   ihr start debug/sequential output
     366  jdstp   jdy stop debug/sequential output
      24  ihstp   ihr stop debug/sequential output
       0  isnsq   Source number for debug/sequential output (0=all sources)
       0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
       0  iprndx  Printout index calculations y(1) n(0)
               |****************************************|
               |*       SOURCE-SPECIFIC MET DATA       *|
               |*          AND MODEL SECTION           *|
               |****************************************|
Fi-----|
       0  modset  Use algorithm sets and assign at source level y(1) n(0)
       0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
               |****************************************|
               |*         Source-Specific (IGM)        *|
               |*      Meteorological Data Section     *|
               |****************************************|
Fi-----|
       7  nfield  (IGM format) met data input, number of fields
       0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
       0  nlvpro  ws/wd profiles: number of levels
       0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
     0.0  stpro   ws/wd profiles: height of first profile level (m)
     0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
    100.    100.    100.    100.    100.    100.     10.     10.  htmets
     wsclm : wind speed threshold (for calm def.)
     htmets: height of wind spd measurement (meters)
               |****************************************|
               |*            Source-Specific           *|
               |*   Regulatory Default Model Section   *|
               |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                          4=COMPLEX-I  5=RTDM  6=SHORTZ
               |****************************************|-->This section used if reg
               |*            Source-Specific           *|   def=0 or to override reg
               |*      User-Defined Model Section      *|   def w/neg # (-999 = 0)
               |****************************************|
Fa-------------------------------------|
                                        :1    User-defined description of
                                        :2    model algorithm sets
                                        :3
                                        :4
                                        :5    These 40-character descriptions
                                        :6    are informational only and may
                                        :7    be left blank
                                        :8
| General technical options      |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (roserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmins
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
    TAF D  Terrain adjustment factor-Stability D
    TAF E  Terrain adjustment factor-Stability E
    TAF F  Terrain adjustment factor-Stability F
    xmina  Minimum approach (meters)
    xwnu   Cross sector width (n/u)
    xws    Cross sector width (stable)
    alpha  Parameter for BID
    xmnscl Minimum height to scale to
    zvfac  Factor to calc xz (1.169 is exact)
    xmxmin minimum mixing height, meters (0.0=no modification)
    halflf pollutant half-life in seconds (0.0=no pollutent decay)
              |****************************************|
              |*       OPTIONAL P & PTG SECTION       *|
              |****************************************|
  | Values in this section are accessed through iopp and iopdth |
  Fr-----|-------|-------|-------|-------|
     1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
  Fr-----|-------|-------|-------|-------|-------|
     0.00    0.00    0.00    0.00    0.00    0.00     A
     0.00    0.00    0.00    0.00    0.00    0.00     B
     0.00    0.00    0.00    0.00    0.00    0.00     C   :PDEF1
     0.00    0.00    0.00    0.00    0.00    0.00     D    iopp=11
     0.00    0.00    0.00    0.00    0.00    0.00     E
     0.00    0.00    0.00    0.00    0.00    0.00     F
  Fr-----|-------|-------|-------|-------|-------|
     0.00    0.00    0.00    0.00    0.00    0.00     A
     0.00    0.00    0.00    0.00    0.00    0.00     B
     0.00    0.00    0.00    0.00    0.00    0.00     C   :PDEF2
     0.00    0.00    0.00    0.00    0.00    0.00     D    iopp=12
     0.00    0.00    0.00    0.00    0.00    0.00     E
     0.00    0.00    0.00    0.00    0.00    0.00     F
  Fr-----|-------|-------|-------|-------|-------|
     0.00    0.00    0.00    0.00    0.00    0.00     A
     0.00    0.00    0.00    0.00    0.00    0.00     B
     0.00    0.00    0.00    0.00    0.00    0.00     C   :PDEF3
     0.00    0.00    0.00    0.00    0.00    0.00     D    iopp=13
     0.00    0.00    0.00    0.00    0.00    0.00     E
     0.00    0.00    0.00    0.00    0.00    0.00     F
  Fr-----|-------|-------|-------|-------|-------|
     .000    .000    .000    .000    .000    .000     A
     .000    .000    .000    .000    .000    .000     B
     .000    .000    .000    .000    .000    .000     C   :DTHDEF1
     .000    .000    .000    .000    .000    .000     D    iopdth=11
     .000    .000    .000    .000    .000    .000     E
     .000    .000    .000    .000    .000    .000     F
  Fr-----|-------|-------|-------|-------|-------|
     .000    .000    .000    .000    .000    .000     A
     .000    .000    .000    .000    .000    .000     B
     .000    .000    .000    .000    .000    .000     C   :DTHDEF2
     .000    .000    .000    .000    .000    .000     D    iopdth=12
     .000    .000    .000    .000    .000    .000     E
     .000    .000    .000    .000    .000    .000     F
  Fr-----|-------|-------|-------|-------|-------|
     .000    .000    .000    .000    .000    .000     A
     .000    .000    .000    .000    .000    .000     B
     .000    .000    .000    .000    .000    .000     C   :DTHDEF3
     .000    .000    .000    .000    .000    .000     D    iopdth=13
     .000    .000    .000    .000    .000    .000     E
     .000    .000    .000    .000    .000    .000     F
              |****************************************|
              |*       HOURLY SOURCE DATA SECTION     *|
              |****************************************|
  Fi-----|
         0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
         0  nshsd   If ihsdat >= 1, number of sources
         0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
              |****************************************|
              |*    OZONE LIMITING METHOD SECTION     *|
              |****************************************|
  Fi-----|
         0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
         0  nssolm  Number of surr source to use for OLM (chi by hour)
       0.0  olmval  Fixed chi value for OLM, only if nssolm=0
              |****************************************|
              |*  HOURLY CHI/SURROGATE SOURCE SECTION *|
              |****************************************|
  Fi-----|
         0  nssorc  Number of surrogate sources in hourly chi file
         0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
         0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
    0    0  (Surr src name)
            |******************************************|
            |* CONCENTRATION CHECK (CHICHK) SECTION *|
            |******************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
IGM v. 92120 Source file converted from ISC2 input file
              |*****************************************|
              |*          FILE SIZING SECTION          *|
              |*****************************************|
Fi-----|
      0  ngroup  Number of source groups (0=each source is a group)
      0  ngtots  Number of totals (0=one total over all groups)
      0  npsorc  Number of point sources
     00  nvsorc  Number of volume sources
      1  nasorc  Number of area sources
      0  nsdsbd  Number of sets of direction-specific building dimensions
      0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
      0  nqf2    Number of "Qflag-2" arrays (vary by month)
      0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
      0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
      0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
              |*****************************************|
              |*          GROUP TOTALS SECTION         *|
              |*            (ngtots lines)             *|
              |*****************************************|
|                                      num-  Group i.d. that define total      |
|          Total Name(s)               num   (max. 99-enter numnum/10 lines)   |
Va-------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

              |*****************************************|
              |*        SOURCE GROUPING SECTION        *|
              |*            (ngroup lines)             *|
              |*****************************************|
|                                     Group  Short  -(Group # assigned to
|          Group Name(s)               i.d. Name(s)   sh name if blank)
Va-------------------------------------|i-|a------|

              |*****************************************|
              |*          POINT SOURCE SECTION         *|
              |*            (npsorc lines)             *|
              |*****************************************|
|      G      B                                                                  |
|      R M M P L Q W                Q      XS      YS      ZS     Hs     Ts     Vs      D     HB     PW |
|SNUM  P P I R D F Q   Source Name  g/sec   (m)     (m)    (ft)    (m)    (K)   (m/s)   (m)    (m)    (m)|
Vi--|--|-|-|-|-|-|-|a--------------|r------|------|-------|-----|-----|-----|-----|-----|-----|-----|
              |*****************************************|
              |*         VOLUME SOURCE SECTION         *|
              |*            (nvsorc lines)             *|
              |*****************************************|
|        Q W                      Q      Xctr   Yctr     ZS   Hctr   SGZO   SGYO|
|SNUM  G MF Q    Source Name    (g/sec)   (m)    (m)    (ft)   (m)    (m)    (m)|
Vi--|--|-||-|a-----------------|r-------|------|------|-----|-----|-----|-----|
              |*****************************************|
              |*          AREA SOURCE SECTION          *|
              |*            (nasorc lines)             *|
              |*****************************************|
|        Q W                      Q      XSw    YSw     ZS   Heff  Width|
|SNUM  G MF Q    Source Name    (g/s/m2)  (m)    (m)    (ft)   (m)    (m)|
Vi--|--|-||-|a-----------------|r-------|------|------|-----|-----|-----|
30001  3 00 0 AREA SOURC 2        1.000362878.3801610 1875.    .0 44.98
|                                                                      |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  /  |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
|                                                                           .Bound|
| N=  0   SET N+1       SET N+2       SET N+3       SET N+4       SET N+5  . Wake|
|        BH     BPW     BH     BPW     BH     BPW     BH     BPW     BH     BPW.Flags|
| FV                                                                        .12345|
Bi-|r------|------|-------|------|-------|------|-------|------|-------|------||||||
  10     0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.00
  20    -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.00
  30    -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.00
  40    -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.00
  50    -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.0   -1.00
```

```
  60    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  70    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  80    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  90    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 100    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 110    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 120    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 130    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 140    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 150    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 160    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 170    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 180    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 190    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 200    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 210    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 220    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 230    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 240    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 250    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 260    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 270    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 280    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 290    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 300    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 310    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 320    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 330    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 340    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 350    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 360    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
               |****************************************|
               |*         EMISSION SCALAR SECTION      *|
               |****************************************|
               |
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
|QFLAG = 4 (Stability end wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 13-24
```

ESWMF IGM MODEL INPUT RUN FILES

FLARE

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

P:\snamdm\130\els.mdl

BKK- Elsmere Proposed Landfill

```
                  |****************************************|
                  |        FILE SPECIFICATION SECTION     *|
                  |****************************************|
Fa------------------------------------|
bkkels13.txt                          * I REQ Meteorological data input file
elsmere.rec                           * I REQ Receptor file
elsflr.SRI                            * I REQ Source file
elsflr13.RNO                          * I OPT Optional run file
n/a                                   * I OPT Terrain profiles (REQ for RTDM)
elsflr13.OFP                          * O REQ Output print file - ASCII
n/a                                   * O OPT Type C disk output - binary
n/a                                   * O OPT Detailed report file - ASCII
n/a                                   * O OPT Processed conc. output - binary
                  |****************************************|
                  |        GENERAL RUN SET-UP SECTION     *|
                  |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-character Run i.d.
                  |****************************************|
                  |        PRINTOUT CONTROL SECTION       *|
                  |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt datailed receptor data      y(1) n(0)   | =B,DorC
      0  isperc      "     "  datailed source data        y(1) n(0)
      0  ispdmo      "     "  model tech optiona          y(1) n(0)
      0  isprsd      "     "  source/rec min. dist        y(1) n(0)
      0  ispsrg      "     "  src groups/totals summ      y(1) n(0)
      0  isppht      "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispins      "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                  |****************************************|
                  |     POST-PROCESSING OPTIONS SECTION    |
                  |****************************************|
Fi-----|
      0  iopdo   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                  |****************************************|
                  |*   AVERAGING TIMES OPTIONS SECTION    *|
                  |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                  |****************************************|
                  |*       MODEL SELECTION SECTION        *|
                  |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                    If RTDM (5) selected:                                    *|
|*                      -irpro must be non-0;                                  *|
|*                      -must create profile file;                             *|
|*                      -must assign profiles in source file;                  *|
|*                                                                             *|
|*Reg Def Models  1 = ISCST2 Rural                                       P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)                P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                                  P     *|
|*  A=area        5 = RTDM Default                                       P     *|
|*  V=volume      6 = SHORTZ Default                                     P     *|
|*                                                                             *|
                  |****************************************|
                  |* METEOROLOGICAL DATA FORMAT SECTION   *|
                  |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*        ANALYSIS SCOPE SECTION        *|
               |*        SOURCE GROUPS & TOTALS        *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*     Source Group Selection Section   *|
               |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*         Group Totals Section         *|
               |*            (ngtots lines)            *|
               |****************************************|
|
|                                    num-  Group numbers that define total     |
|         Total Name(s)              num   (max. 99-enter numnum/10 lines)     |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*    CONC. THRESHOLD-BASED SECTION     *|
               |*              (TYPE C)                *|
               |*        (numcsc cases/blocks)         *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
BKK- Elsmere Proposed Landfill
                |****************************************|
                |          FILE SPECIFICATION SECTION   *|
                |****************************************|
Fa--------------------------------------|
bkkels2.txt                              * I REQ Meteorological data input file
elsmere.rec                              * I REQ Receptor file
elsflr.SRI                               * I REQ Source file
elsflr2.RNO                              * I OPT Optional run file
n/a                                      * I OPT Terrain profiles (REQ for RTDM)
elsflr2.OFP                              * O REQ Output print file - ASCII
n/a                                      * O OPT Type C disk output - binary
n/a                                      * O OPT Detailed report file - ASCII
n/a                                      * O OPT Processed conc. output - binary
                |****************************************|
                |          GENERAL RUN SET-UP SECTION   *|
                |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill        :24-character Run i.d.
                |****************************************|
                |          PRINTOUT CONTROL SECTION     *|
                |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt datailed receptor data      y(1) n(0)    | =B,DorC
      0  ispsrc      "     "  datailed source data        y(1) n(0)
      0  ispdmo      "     "  model tech options          y(1) n(0)
      0  isprad      "     "  source/rec min. dist        y(1) n(0)
      0  ispsrg      "     "  src groups/totals summ      y(1) n(0)
      0  isppht      "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispina      "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                |****************************************|
                |      POST-PROCESSING OPTIONS SECTION   |
                |****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |****************************************|
                |*   AVERAGING TIMES OPTIONS SECTION    *|
                |****************************************|
Fi---|-----|-----|-----|
    -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
     1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
    10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                |****************************************|
                |*          MODEL SELECTION SECTION     *|
                |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                    *|
|*                   -irpro must be non-0;                                  *|
|*                   -must create profile file;                             *|
|*                   -must assign profiles in source file;                  *|
|*                                                                          *|
|*Reg Def Models  1 = ISCST2 Rural                                   P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)            P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                              P     *|
|*  A=area        5 = RTDM Default                                   P     *|
|*  V=volume      6 = SHORTZ Default                                 P     *|
|*                                                                          *|
                |****************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION   *|
                |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY  *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*        ANALYSIS SCOPE SECTION        *|
               |*        SOURCE GROUPS & TOTALS        *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*    Source Group Selection Section    *|
               |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*          Group Totals Section        *|
               |*            (ngtots lines)            *|
               |****************************************|
|
|                                      num-  Group numbers that define total    |
|         Total Name(s)                num   (max. 99-enter numnum/10 lines)    |
Va------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*     CONC. THRESHOLD-BASED SECTION    *|
               |*              (TYPE C)                *|
               |*         (numcsc cases/blocks)        *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                  (1)-To create a summary ("significant impact") report that is
                      based on both concentration sums exceeding the applicable
                      threshold criteria. Concentrations written to the "Type C"
                      file, and in the detailed report (if selected), are based
                      on meeting the first threshold criterion only
                  (2)-To limit concentrations written to file, and in the
                      detailed report (if selected), to only those that meet
                      both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
Otional Run File - Elsmere Landfill
            |****************************************|
            |*      FILE SPECIFICATION SECTION      *|
            |****************************************|
Fa-----------------------------------|
n/a                                   * I OPT Hourly chi (surr src) file
n/a                                   * I OPT Hourly source data input file
elsflr13.SEQ                          * O OPT Sequential output file
n/a                                   * O OPT Debug Output file
            |****************************************|
            |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
            |****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdatr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy stop debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
            |****************************************|
            |*      SOURCE-SPECIFIC MET DATA        *|
            |*          AND MODEL SECTION           *|
            |****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
            |****************************************|
            |*        Source-Specific (IGM)         *|
            |*     Meteorological Data Section      *|
            |****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
            |****************************************|
            |*           Source-Specific            *|
            |*   Regulatory Default Model Section   *|
            |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg dof: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                       4=COMPLEX-I  5=RTDM  6=SHORTZ
            |****************************************|-->This section used if reg
            |*           Source-Specific            *|   def=0 or to override reg
            |*     User-Defined Model Section       *|   def w/neg # (-999 = 0)
            |****************************************|
Fa-----------------------------------|
                                     :1    User-defined description of
                                     :2    model algorithm sets
                                     :3
                                     :4
                                     :5    These 40-character descriptions
                                     :6    are informational only and may
                                     :7    be left blank
                                     :8
| General technical options      |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichcp   Chcp terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifep    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
   0   0   0   0   0   0   0   0  ifed    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmins
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halfif
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
TAF D  Terrain adjustment factor-Stability D
TAF E  Terrain adjustment factor-Stability E
TAF F  Terrain adjustment factor-Stability F
xmina  Minimum approach (meters)
xwnu   Cross sector width (n/u)
xws    Cross sector width (stable)
alpha  Parameter for BID
xmnscl Minimum height to scale to
zvfac  Factor to calc xz (1.169 is exact)
xmxmin minimum mixing height, meters (0.0=no modification)
halflf pollutant half-life in seconds (0.0=no pollutant decay)
          |***************************************|
          |*      OPTIONAL P & PTG SECTION         *|
          |***************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF1
   0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=11
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF2
   0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=12
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF3
   0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=13
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C   :DTHDEF1
   .000    .000    .000    .000    .000    .000    D    iopdth=11
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C   :DTHDEF2
   .000    .000    .000    .000    .000    .000    D    iopdth=12
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C   :DTHDEF3
   .000    .000    .000    .000    .000    .000    D    iopdth=13
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
          |****************************************|
          |*      HOURLY SOURCE DATA SECTION       *|
          |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshed   If ihsdat >= 1, number of sources
       0  ifmhed  Format of hrly source data file ASCII(1) or unformatted(2)
          |****************************************|
          |*    OZONE LIMITING METHOD SECTION      *|
          |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
          |****************************************|
          |*  HOURLY CHI/SURROGATE SOURCE SECTION  *|
          |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a-----------------| --> nssorc lines
    0    0  (Surr src name)
           |****************************************|
           |* CONCENTRATION CHECK (CHICHK) SECTION *|
           |****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
Otional Run File - Elsmere Landfill
            |****************************************|
            |*      FILE SPECIFICATION SECTION      *|
            |****************************************|
Fa------------------------------------|
n/a                                    * I OPT Hourly chi (surr src) file
n/a                                    * I OPT Hourly source data input file
elsflr2.SEQ                            * O OPT Sequential output file
n/a                                    * O OPT Debug Output file
            |****************************************|
            |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
            |****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdstr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy stop debug/sequential output
     24  ihstp   ihr stcp debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
            |****************************************|
            |*      SOURCE-SPECIFIC MET DATA        *|
            |*         AND MODEL SECTION            *|
            |****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
            |****************************************|
            |*        Source-Specific (IGM)         *|
            |*     Meteorological Data Section      *|
            |****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0   ifldks  Met. field for stability
   6   6   6   6   6   6   2   0   ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0   ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0   ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0   ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
            |****************************************|
            |*           Source-Specific            *|
            |*   Regulatory Default Model Section   *|
            |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0   Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                            4=COMPLEX-I  5=RTDM  6=SHORTZ
            |****************************************|-->This section used if reg
            |*           Source-Specific            *|   def=0 or to override reg
            |*     User-Defined Model Section       *|   def w/neg # (-999 = 0)
            |****************************************|
Fa------------------------------------|
                                       :1     User-defined description of
                                       :2     model algorithm sets
                                       :3
                                       :4
                                       :5     Those 40-character descriptions
                                       :6     are informational only and may
                                       :7     be left blank
                                       :8
| General technical options      |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmina
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfsc
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
TAF D   Terrain adjustment factor-Stability D
TAF E   Terrain adjustment factor-Stability E
TAF F   Terrain adjustment factor-Stability F
xmina   Minimum approach (meters)
xwnu    Cross sector width (n/u)
xws     Cross sector width (stable)
alpha   Parameter for BID
xmnscl  Minimum height to scale to
zvfsc   Factor to calc xz (1.169 is exact)
xmxmin  minimum mixing height, meters (0.0=no modification)
halflf  pollutant half-life in seconds (0.0=no pollutant decay)
            |****************************************|
            |*      OPTIONAL P & PTG SECTION        *|
            |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
    1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF1
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=11
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF2
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=12
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF3
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=13
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF1
    .000    .000    .000    .000    .000    .000    D    iopdth=11
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF2
    .000    .000    .000    .000    .000    .000    D    iopdth=12
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF3
    .000    .000    .000    .000    .000    .000    D    iopdth=13
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
            |****************************************|
            |*      HOURLY SOURCE DATA SECTION      *|
            |****************************************|
Fi-----|
      0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
      0  nshed   If ihsdat >= 1, number of sources
      0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
            |****************************************|
            |*    OZONE LIMITING METHOD SECTION     *|
            |****************************************|
Fi-----|
      0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
      0  nssolm  Number of surr source to use for OLM (chi by hour)
    0.0  olmval  Fixed chi value for OLM, only if nssolm=0
            |****************************************|
            |*  HOURLY CHI/SURROGATE SOURCE SECTION *|
            |****************************************|
Fi-----|
      0  nssorc  Number of surrogate sources in hourly chi file
      0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
      0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a-----------------| --> nssorc lines
    0    0  (Surr src name)
           |*****************************************|
           |* CONCENTRATION CHECK (CHICHK) SECTION *|
           |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
IGM v. 92120 Source file converted from ISC2 input file
                    |*****************************************|
                    |*         FILE SIZING SECTION            *|
                    |*****************************************|
Fi-----|
       0  ngroup  Number of source groups (0=each source is a group)
       0  ngtots  Number of totals (0=one total over all groups)
       1  npsorc  Number of point sources
       0  nvsorc  Number of volume sources
       0  nasorc  Number of area sources
       0  nsdsbd  Number of sets of direction-specific building dimensions
       0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
       0  nqf2    Number of "Qflag-2" arrays (vary by month)
       0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
       0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
       0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
                    |*****************************************|
                    |*         GROUP TOTALS SECTION           *|
                    |*            (ngtots lines)              *|
                    |*****************************************|
|                                       num-  Group i.d. that define total          |
|         Total Name(s)                 num   (max. 99-enter numnum/10 lines)       |
Va-------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|---|

                    |*****************************************|
                    |*       SOURCE GROUPING SECTION          *|
                    |*            (ngroup lines)              *|
                    |*****************************************|
|                                      Group  Short  -(Group # assigned to
|         Group Name(s)                 i.d. Name(s)   sh name if blank)
Va-------------------------------------|i-|a------|

                    |*****************************************|
                    |*         POINT SOURCE SECTION           *|
                    |*            (npsorc lines)              *|
                    |*****************************************|
|      G          B                                                                        |
|      R N N P L Q W                      Q       XS      YS      ZS     Hs     Ts     Vs     D      HB     PW |
|SNUM  P P I R D F Q     Source Name     g/sec    (m)     (m)    (ft)    (m)    (K)  (m/s)  (m)    (m)    (m)|
Vi--|--|-|-|-|-|-|-|a------------------|r------|-------|-------|------|------|------|------|------|------|------|
10001  1 0 0 0 0 0 0 POINT SRC  1          1.00364960.3802066 3121.12.1921033.2  4.57 2.438     .0     .0
                    |*****************************************|
                    |*        VOLUME SOURCE SECTION           *|
                    |*            (nvsorc lines)              *|
                    |*****************************************|
|       Q W                          Q      Xctr    Yctr     ZS    Hctr   SGZ0   SGY0|
|SNUM  G NF Q     Source Name     (g/sec)    (m)     (m)    (ft)   (m)    (m)    (m)|
Vi--|--|-||-|a------------------|r------|-------|-------|------|------|------|------|
                    |*****************************************|
                    |*         AREA SOURCE SECTION            *|
                    |*            (nasorc lines)              *|
                    |*****************************************|
|       Q W                          Q       XSw     YSw     ZS    Heff  Width|
|SNUM  G NF Q     Source Name     (g/s/m2)   (m)     (m)    (ft)   (m)    (m) |
Vi--|--|-||-|a------------------|r------|-------|-------|------|------|------|
|                                                                                    |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  /  |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
|                                                                            .Bound|
| N=  0   SET N+1        SET N+2        SET N+3        SET N+4        SET N+5 . Wake|
|          BH     BPW      BH     BPW      BH     BPW      BH     BPW      BH    BPW.Flags|
| FV                                                                          .12345|
Bi-|r------|------|-------|------|-------|------|-------|------|-------|------||||||
  10     0.0    0.0     0.0    0.0     0.0    0.0     0.0    0.0     0.0    0.00
  20    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  30    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  40    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
  50    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
```

```
 60    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 70    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 80    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 90    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
100    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
110    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
120    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
130    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
140    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
150    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
160    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
170    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
180    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
190    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
200    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
210    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
220    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
230    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
240    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
250    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
260    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
270    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
280    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
290    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
300    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
310    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
320    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
330    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
340    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
350    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
360    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
              |****************************************|
              |*        EMISSION SCALAR SECTION       *|
              |****************************************|
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
|QFLAG = 4 (Stability and wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 13-24
```

ESWMF IGM MODEL INPUT RUN FILES

LANDFILL CONSTRUCTION EQUIPMENT

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

P:\snamdm\130\els.mdl

```
BKK- Elsmere Proposed Landfill
                |****************************************|
                |       FILE SPECIFICATION SECTION      *|
                |****************************************|
Fa------------------------------------|
bkkels13.txt                           * I REQ Meteorological data input file
elsmere.rec                            * I REQ Receptor file
elslfc.SRI                             * I REQ Source file
elslfc13.RNO                           * I OPT Optional run file
n/a                                    * I OPT Terrain profiles (REQ for RTDM)
elslfc13.OFP                           * O REQ Output print file - ASCII
n/a                                    * O OPT Type C disk output - binary
n/a                                    * O OPT Detailed report file - ASCII
n/a                                    * O OPT Processed conc. output - binary
                |****************************************|
                |       GENERAL RUN SET-UP SECTION      *|
                |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-character Run i.d.
                |****************************************|
                |       PRINTOUT CONTROL SECTION        *|
                |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprop  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isperc      "      "  detailed source data       y(1) n(0)
      0  ispdmo      "      "  model tech options         y(1) n(0)
      0  isprad      "      "  source/rec min. dist       y(1) n(0)
      0  isperg      "      "  src groups/totals summ     y(1) n(0)
      0  ispdht      "      "  plume height/Hcrit tables  y(1) n(0)
      0  ispina      "      "  interm terr summary report y(1) n(0)
      1  ipgc    PC(1) or mainfrsme(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                |****************************************|
                |     POST-PROCESSING OPTIONS SECTION    |
                |****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |****************************************|
                |*    AVERAGING TIMES OPTIONS SECTION   *|
                |****************************************|
Fi---|-----|-----|-----|
    -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
     1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
    10     0     0     0  Rank based (Type D)    N-hi (0=no Type D)
                |****************************************|
                |*       MODEL SELECTION SECTION        *|
                |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                     *|
|*                   -irpro must be non-0;                                   *|
|*                   -must create profile file;                              *|
|*                   -must assign profiles in source file;                   *|
|*                                                                           *|
|*Reg Def Models  1 = ISCST2 Rural                                    P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)             P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                               P     *|
|*  A=area        5 = RTDM Default                                    P     *|
|*  V=volume      6 = SHORTZ Default                                  P     *|
|*                                                                          *|
                |****************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION   *|
                |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;    -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*        ANALYSIS SCOPE SECTION        *|
               |*        SOURCE GROUPS & TOTALS        *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*    Source Group Selection Section    *|
               |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*         Group Totals Section         *|
               |*            (ngtots lines)            *|
               |****************************************|
|
|                                      num-  Group numbers that define total       |
|         Total Name(s)                num   (max. 99-enter numnum/10 lines)       |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*    CONC. THRESHOLD-BASED SECTION     *|
               |*               (TYPE C)               *|
               |*         (numcsc cases/blocks)        *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---|  ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
BKK- Elsmere Proposed Landfill
                |****************************************|
                |        FILE SPECIFICATION SECTION     *|
                |****************************************|
Fa-------------------------------------|
bkkels2.txt                             * I REQ Meteorological data input file
elsmere.rec                             * I REQ Receptor file
elslfc.SRI                              * I REQ Source file
elslfc2.RNO                             * I OPT Optional run file
n/a                                     * I OPT Terrain profiles (REQ for RTDM)
elslfc2.OFP                             * O REQ Output print file - ASCII
n/a                                     * O OPT Type C disk output - binary
n/a                                     * O OPT Detailed report file - ASCII
n/a                                     * O OPT Processed conc. output - binary
                |****************************************|
                |        GENERAL RUN SET-UP SECTION     *|
                |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-charecter Run i.d.
                |****************************************|
                |        PRINTOUT CONTROL SECTION       *|
                |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isperc      "     "  detailed source data        y(1) n(0)
      0  ispdmo      "     "  model tech eptions          y(1) n(0)
      0  ispred      "     "  source/rec min. dist        y(1) n(0)
      0  isperg      "     "  src groups/totals summ      y(1) n(0)
      0  isppht      "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispins      "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                |****************************************|
                |     POST-PROCESSING OPTIONS SECTION    |
                |****************************************|
Fi-----|
      0  iopdo   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |****************************************|
                |*   AVERAGING TIMES OPTIONS SECTION    *|
                |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                |****************************************|
                |*       MODEL SELECTION SECTION        *|
                |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                     *|
|*                    -irpro must be non-0;                                  *|
|*                    -must create profile file;                             *|
|*                    -must assign profiles in source file;                  *|
|*                                                                           *|
|*Reg Def Models  1 = ISCST2 Rural                                     P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)              P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                                P     *|
|*  A=area        5 = RTDM Default                                     P     *|
|*  V=volume      6 = SHORTZ Default                                   P     *|
|*                                                                           *|
                |****************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION   *|
                |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bsmetf  Base elevation of met measurements (feet); applicable only with SHORTZ
              |****************************************|
              |* ANALYSIS SCOPE SECTION: METEOROLOGY  *|
              |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
              |****************************************|
              |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
              |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
              |****************************************|
              |*        ANALYSIS SCOPE SECTION        *|
              |*        SOURCE GROUPS & TOTALS        *|
              |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
              |****************************************|
              |*     Source Group Selection Section   *|
              |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
              |****************************************|
              |*          Group Totals Section        *|
              |*             (ngtots lines)           *|
              |****************************************|
|
|                                      num-  Group numbers that define total     |
|          Total Name(s)               num   (max. 99-enter numnum/10 lines)     |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

              |****************************************|
              |*      CONC. THRESHOLD-BASED SECTION   *|
              |*               (TYPE C)               *|
              |*         (numcsc cases/blocks)        *|
              |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

Otional Run File - Elsmere Landfill

```
             |****************************************|
             |*      FILE SPECIFICATION SECTION      *|
             |****************************************|
Fa-----------------------------------|
n/a                                   * I OPT Hourly chi (surr src) file
n/a                                   * I OPT Hourly source data input file
elslfc13.SEQ                          * O OPT Sequential output file
n/a                                   * O OPT Debug Output file
             |****************************************|
             |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
             |****************************************|
Fi-----|
       1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
       0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
       1  jdatr   jdy start debug/sequential output
       1  ihstr   ihr start debug/sequential output
     366  jdatp   jdy stop debug/sequential output
      24  ihstp   ihr stop debug/sequential output
       0  isnsq   Source number for debug/sequential output (0=all sources)
       0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
       0  iprndx  Printout index calculations y(1) n(0)
             |****************************************|
             |*      SOURCE-SPECIFIC MET DATA        *|
             |*         AND MODEL SECTION            *|
             |****************************************|
Fi-----|
       0  modset  Use algorithm sets and assign at source level y(1) n(0)
       0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
             |****************************************|
             |*       Source-Specific (IGM)          *|
             |*    Meteorological Data Section       *|
             |****************************************|
Fi-----|
       7  nfield  (IGM format) met data input, number of fields
       0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
       0  nlvpro  ws/wd profiles: number of levels
       0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
     0.0  stpro   ws/wd profiles: height of first profile level (m)
     0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
    100.    100.    100.    100.    100.    100.     10.     10.  htmets
     wsclm : wind speed threshold (for calm def.)
     htmets: height of wind spd measurement (meters)
             |****************************************|
             |*          Source-Specific             *|
             |*   Regulatory Default Model Section   *|
             |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                             4=COMPLEX-I  5=RTDM  6=SHORTZ
             |****************************************|-->This section used if reg
             |*          Source-Specific             *|   def=0 or to override reg
             |*     User-Defined Model Section       *|   def w/neg # (-999 = 0)
             |****************************************|
Fa-----------------------------------|
                                     :1    User-defined description of
                                     :2    model algorithm sets
                                     :3
                                     :4
                                     :5    These 40-character descriptions
                                     :6    are informational only and may
                                     :7    be left blank
                                     :8
| General technical options  |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=RriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-ep)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profilas/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=arrey n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise we
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 5=hourly, >10:1n=arrey n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume lovel
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk tep; 2=plume lovel
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws ecaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intonsity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmine
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
  TAF D  Terrain adjustment factor-Stability D
  TAF E  Terrain adjustment factor-Stability E
  TAF F  Terrain adjustment factor-Stability F
  xmina  Minimum approach (meters)
  xwnu   Cross sector width (n/u)
  xws    Cross sector width (stable)
  alpha  Parameter for BID
  xmnscl Minimum height to scale to
  zvfac  Factor to calc xz (1.169 is exact)
  xmxmin minimum mixing height, meters (0.0=no modification)
  halflf pollutant half-life in seconds (0.0=no pollutant decay)
             |****************************************|
             |*      OPTIONAL P & PTG SECTION        *|
             |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
    1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF1
    .000    .000    .000    .000    .000    .000    D     iopdth=11
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF2
    .000    .000    .000    .000    .000    .000    D     iopdth=12
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF3
    .000    .000    .000    .000    .000    .000    D     iopdth=13
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
             |****************************************|
             |*      HOURLY SOURCE DATA SECTION      *|
             |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshed   If ihsdat >= 1, number of sources
       0  ifmhed  Format of hrly source data file ASCII(1) or unformatted(2)
             |****************************************|
             |*    OZONE LIMITING METHOD SECTION     *|
             |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
             |****************************************|
             |*  HOURLY CHI/SURROGATE SOURCE SECTION *|
             |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
   0    0  (Surr src name)
            |****************************************|
            |* CONCENTRATION CHECK (CHICHK) SECTION *|
            |****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
Otional Run File - Elsmere Landfill
              |****************************************|
              |*      FILE SPECIFICATION SECTION      *|
              |****************************************|
Fa-----------------------------------|
n/a                                   * I OPT Hourly chi (surr src) file
n/a                                   * I OPT Hourly source data input file
elslfc2.SEQ                           * O OPT Sequential output file
n/a                                   * O OPT Debug Output file
              |****************************************|
              |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
              |****************************************|
Fi-----|
       1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
       0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
       1  jdatr   jdy start debug/sequential output
       1  ihstr   ihr start debug/sequential output
     366  jdetp   jdy stop debug/sequential output
      24  ihstp   ihr stop debug/sequential output
       0  isnsq   Source number for debug/sequential output (0=all sources)
       0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
       0  iprndx  Printout index calculations y(1) n(0)
              |****************************************|
              |*      SOURCE-SPECIFIC MET DATA        *|
              |*          AND MODEL SECTION           *|
              |****************************************|
Fi-----|
       0  modset  Use algorithm sets and assign at source level y(1) n(0)
       0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
              |****************************************|
              |*        Source-Specific (IGM)         *|
              |*     Meteorological Data Section      *|
              |****************************************|
Fi-----|
       7  nfield  (IGM format) met data input, number of fields
       0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
       0  nlvpro  ws/wd profiles: number of levels
       0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
     0.0  stpro   ws/wd profiles: height of first profile level (m)
     0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
    100.    100.    100.    100.    100.    100.    10.     10.   htmets
     wsclm : wind speed threshold (for calm def.)
     htmets: height of wind spd measurement (meters)
              |****************************************|
              |*           Source-Specific            *|
              |*   Regulatory Default Model Section   *|
              |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                            4=COMPLEX-I  5=RTDM  6=SHORTZ
              |****************************************|-->This section used if reg
              |*           Source-Specific            *|    def=0 or to override reg
              |*     User-Defined Model Section       *|    def w/neg # (-999 = 0)
              |****************************************|
Fa-----------------------------------|
                                      :1    User-defined description of
                                      :2    model algorithm sets
                                      :3
                                      :4
                                      :5    These 40-character descriptions
                                      :6    are informational only and may
                                      :7    be left blank
                                      :8
| General technical options |
Fi-|---|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concantrstions in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflaction per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profilas/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage eptions |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=arrey n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=arrey n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk tcp; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume leval
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=steck, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmins
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
  TAF D  Terrain adjustment factor-Stability D
  TAF E  Terrain adjustment factor-Stability E
  TAF F  Terrain adjustment factor-Stability F
  xmins  Minimum approach (meters)
  xwnu   Cross sector width (n/u)
  xws    Cross sector width (stable)
  alpha  Parameter for BID
  xmnscl Minimum height to scale to
  zvfac  Factor to calc xz (1.169 is exact)
  xmxmin minimum mixing height, meters (0.0=no modification)
  halflf pollutant half-life in seconds (0.0=no pollutant decay)
           |**************************************|
           |*      OPTIONAL P & PTG SECTION       *|
           |**************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF1
   .000    .000    .000    .000    .000    .000    D     iopdth=11
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF2
   .000    .000    .000    .000    .000    .000    D     iopdth=12
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF3
   .000    .000    .000    .000    .000    .000    D     iopdth=13
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
           |****************************************|
           |*      HOURLY SOURCE DATA SECTION       *|
           |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
           |****************************************|
           |*    OZONE LIMITING METHOD SECTION      *|
           |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
           |****************************************|
           |*  HOURLY CHI/SURROGATE SOURCE SECTION *|
           |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogete source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a-----------------| --> nssorc lines
    0    0  (Surr src name)
             |*****************************************|
             |* CONCENTRATION CHECK (CHICHK) SECTION *|
             |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julien day & receptor no. combination to create CHICHK for
```

```
 IGM v. 92120 Source file converted from ISC2 input file
                |****************************************|
                |*         FILE SIZING SECTION          *|
                |****************************************|
Fi-----|
       0  ngroup  Number of source groups (0=each source is a group)
       0  ngtots  Number of totals (0=one total over all groups)
       0  npsorc  Number of point sources
       0  nvsorc  Number of volume sources
      11  nasorc  Number of area sources
       0  nsdsbd  Number of sets of direction-specific building dimensions
       0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
       0  nqf2    Number of "Qflag-2" arrays (vary by month)
       0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
       0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
       0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
                |****************************************|
                |*        GROUP TOTALS SECTION          *|
                |*          (ngtots lines)              *|
                |****************************************|
|                                    num-  Group i.d. that define total        |
|        Total Name(s)               num   (max. 99-enter numnum/10 lines)     |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

                |****************************************|
                |*      SOURCE GROUPING SECTION         *|
                |*          (ngroup lines)              *|
                |****************************************|
|                                   Group  Short  -(Group # assigned to
|        Group Name(s)               i.d. Name(s)   sh name if blank)
Va-----------------------------------|i-|a------|

                |****************************************|
                |*        POINT SOURCE SECTION          *|
                |*          (npsorc lines)              *|
                |****************************************|
|     G       B                                                                 |
|     R M M P L Q W                Q       XS      YS      ZS     Hs     Ts     Vs      D     HB     PW |
|SNUM P P I R D F Q   Source Name    g/sec    (m)     (m)    (ft)    (m)    (K)   (m/s)   (m)    (m)    (m)|
Vi--|--|-|-|-|-|-|-|a-----------------|r------|------|------|-----|-----|-----|-----|-----|-----|-----|
                |****************************************|
                |*       VOLUME SOURCE SECTION          *|
                |*          (nvsorc lines)              *|
                |****************************************|
|       Q W                    Q      Xctr    Yctr    ZS    Hctr   SGZO   SGYO|
|SNUM  G MF Q   Source Name  (g/sec)   (m)     (m)   (ft)   (m)    (m)    (m)|
Vi--|--|-||-|a-----------------|r------|------|------|-----|-----|-----|-----|
                |****************************************|
                |*        AREA SOURCE SECTION           *|
                |*          (nasorc lines)              *|
                |****************************************|
|       Q W                    Q      XSw     YSw    ZS    Heff  Width|
|SNUM  G MF Q   Source Name  (g/s/m2)  (m)     (m)   (ft)   (m)    (m) |
Vi--|--|-||-|a-----------------|r------|------|------|-----|-----|-----|
30002  4 00 0 AREA SOURC 3         1.000364125.3802000 2650.    .0  375.
30003  4 00 0 AREA SOURC 4         1.000364125.3801625 3000.    .0  375.
30004  4 00 0 AREA SOURC 5         1.000364500.3801875 2825.    .0  375.
30005  4 00 0 AREA SOURC 6         1.000363750.3801250 2950.    .0  375.
30006  4 00 0 AREA SOURC 7         1.000364125.3801250 3000.    .0  375.
30007  4 00 0 AREA SOURC 8         1.000363500.3800875 2800.    .0  375.
30008  4 00 0 AREA SOURC 9         1.000363875.3801000 2850.    .0  250.
30009  4 00 0 AREA SOURC 10        1.000363375.3800875 2600.    .0  125.
30010  4 00 0 AREA SOURC 11        1.000363250.3800750 2400.    .0  125.
30011  4 00 0 AREA SOURC 12        1.000363375.3800750 2500.    .0  125.
30012  4 00 0 AREA SOURC 13        1.000363500.3800675 2700.    .0  250.
|                                                                      |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  /  |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
```

```
|                                                                      .Bound|
| N=  0   SET N+1         SET N+2         SET N+3         SET N+4         SET N+5 . Wake|
|         BH     BPW      BH     BPW      BH     BPW      BH     BPW      BH    BPW.Flags|
| FV                                                                       .12345|
Bi-|r------|------|-------|------|-------|------|-------|------|-------|------||||||
  10     0.0    0.0      0.0    0.0      0.0    0.0      0.0    0.0      0.0   0.00
  20    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  30    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  40    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  50    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  60    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  70    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  80    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
  90    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 100    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 110    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 120    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 130    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 140    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 150    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 160    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 170    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 180    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 190    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 200    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 210    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 220    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 230    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 240    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 250    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 260    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 270    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 280    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 290    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 300    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 310    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 320    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 330    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 340    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 350    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
 360    -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0   -1.0     -1.0  -1.00
               |****************************************|
               |*        EMISSION SCALAR SECTION       *|
               |****************************************|
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
|QFLAG = 4 (Stability and wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
```

1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	3	13-24
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	4	1-12
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1	4	13-24

ESWMF IGM MODEL INPUT RUN FILES

LANDFILL USER TRAFFIC

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

P:\snamdm\130\els.mdl

```
BKK- Elsmere Proposed Landfill
                |*****************************************|
                |         FILE SPECIFICATION SECTION     *|
                |*****************************************|
Fa------------------------------------|
bkkels13.txt                          * I REQ Meteorological data input file
elsmere.rec                           * I REQ Receptor file
elslft.SRI                            * I REQ Source file
elslft13.RNO                          * I OPT Optional run file
n/a                                   * I OPT Terrain profiles (REQ for RTDM)
elslft13.OFP                          * O REQ Output print file - ASCII
n/a                                   * O OPT Type C disk output - binary
n/a                                   * O OPT Detailed report file - ASCII
n/a                                   * O OPT Processed conc. output - binary
                |*****************************************|
                |         GENERAL RUN SET-UP SECTION     *|
                |*****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa---------------------|
   Elsmere Landfill       :24-character Run i.d.
                |*****************************************|
                |         PRINTOUT CONTROL SECTION       *|
                |*****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprc      "     "  detailed source data        y(1) n(0)
      0  ispdmo     "     "  model tech options          y(1) n(0)
      0  ispred     "     "  source/rec min. dist        y(1) n(0)
      0  isperg     "     "  src groups/totals summ      y(1) n(0)
      0  isppht     "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispins     "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                |*****************************************|
                |    POST-PROCESSING OPTIONS SECTION      |
                |*****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |*****************************************|
                |*   AVERAGING TIMES OPTIONS SECTION     *|
                |*****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                |*****************************************|
                |*       MODEL SELECTION SECTION         *|
                |*****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                    *|
|*                   -irpro must be non-0;                                  *|
|*                   -must create profile file;                             *|
|*                   -must assign profiles in source file;                  *|
|*                                                                          *|
|*Reg Def Models  1 = ISCST2 Rural                                  P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)           P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                             P     *|
|*  A=area        5 = RTDM Default                                  P     *|
|*  V=volume      6 = SHORTZ Default                                P     *|
|*                                                                        *|
                |*****************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION    *|
                |*****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
   10.00  ranht  Wind speed measurement height, meters
  190.00 bsmetf  Base elevation of met measurements (feet); applicable only with SHORTZ
              |*****************************************|
              |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
              |*****************************************|
Fi-----|
       0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
              |*****************************************|
              |*  ANALYSIS SCOPE SECTION: RECEPTORS  *|
              |*****************************************|
Fi-----|
       0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
       0  Grid number to select
              |*****************************************|
              |*        ANALYSIS SCOPE SECTION         *|
              |*        SOURCE GROUPS & TOTALS         *|
              |*****************************************|
Fi-----|
       0  ngrpsl Number of groups to select from src file (0=default to src file)
       0  ngtots Number of totals to create in this file  (0=default to src file)
              |*****************************************|
              |*    Source Group Selection Section     *|
              |*****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
              |*****************************************|
              |*         Group Totals Section          *|
              |*           (ngtots lines)              *|
              |*****************************************|
|
|                                  num-  Group numbers that define total      |
|         Total Name(s)            num   (max. 99-enter numnum/10 lines)      |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

              |*****************************************|
              |*      CONC. THRESHOLD-BASED SECTION    *|
              |*              (TYPE C)                 *|
              |*        (numcsc cases/blocks)          *|
              |*****************************************|
Fi-----|
       0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
    1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
       0  ktcsc   Total to which this threshold case applies
       0  ncntc   Number of threshold testing conditions (1 or 2)
       0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
       0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
       0  igwrt   Include group contributions in file & printout y(1) n(0)
       0  iusth2  Use of second threshold testing condition:
                    (1)-To create a summary ("significant impact") report that is
                        based on both concentration sums exceeding the applicable
                        threshold criteria. Concentrations written to the "Type C"
                        file, and in the detailed report (if selected), are based
                        on meeting the first threshold criterion only
                    (2)-To limit concentrations written to file, and in the
                        detailed report (if selected), to only those that meet
                        both threshold criteria
fi-----|-------|-------|-------|
       0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
     0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
     0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

BKK- Elsmere Proposed Landfill

```
                   |****************************************|
                   |        FILE SPECIFICATION SECTION     *|
                   |****************************************|
Fa-------------------------------------|
bkkels2.txt                             * I REQ Meteorological data input file
elsmere.rec                             * I REQ Receptor file
elslft.SRI                              * I REQ Source file
elslft2.RNO                             * I OPT Optional run file
n/a                                     * I OPT Terrain profiles (REQ for RTDM)
elslft2.OFP                             * O REQ Output print file - ASCII
n/a                                     * O OPT Type C disk output - binary
n/a                                     * O OPT Detailed report file - ASCII
n/a                                     * O OPT Processed conc. output - binary
                   |****************************************|
                   |        GENERAL RUN SET-UP SECTION     *|
                   |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-character Run i.d.
                   |****************************************|
                   |         PRINTOUT CONTROL SECTION      *|
                   |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprc      "     "  detailed source data         y(1) n(0)
      0  ispdmo     "     "  model tech options           y(1) n(0)
      0  isprsd     "     "  source/rec min. dist         y(1) n(0)
      0  isprg      "     "  src groups/totals summ       y(1) n(0)
      0  ispht      "     "  plume height/Hcrit tables    y(1) n(0)
      0  ispins     "     "  interm terr summary report   y(1) n(0)
      1  ipgc    PC(1) or mainfrme(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                   |****************************************|
                   |       POST-PROCESSING OPTIONS SECTION  |
                   |****************************************|
Fi-----|
      0  iopdo   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                   |****************************************|
                   |*  AVERAGING TIMES OPTIONS SECTION     *|
                   |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                   |****************************************|
                   |*        MODEL SELECTION SECTION       *|
                   |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                    If RTDM (5) selected:                                *|
|*                      -irpro must be non-0;                              *|
|*                      -must create profile file;                         *|
|*                      -must assign profiles in source file;              *|
|*                                                                         *|
|*Reg Def Models  1 = ISCST2 Rural                                    P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)             P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                               P     *|
|*  A=area        5 = RTDM Default                                    P     *|
|*  V=volume      6 = SHORTZ Default                                  P     *|
|*                                                                         *|
                   |****************************************|
                   |* METEOROLOGICAL DATA FORMAT SECTION   *|
                   |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bametf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |****************************************|
Fi-----|
      0  ngrslc Number of gride to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*        ANALYSIS SCOPE SECTION        *|
               |*        SOURCE GROUPS & TOTALS        *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*    Source Group Selectien Section    *|
               |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*          Group Totals Section        *|
               |*            (ngtots lines)            *|
               |****************************************|
|
|                                  num-  Group numbers that define total        |
|        Total Name(s)             num   (max. 99-enter numnum/10 lines)        |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*     CONC. THRESHOLD-BASED SECTION    *|
               |*              (TYPE C)                *|
               |*         (numcsc cases/blocks)        *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominelly 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
Otional Run File - Elsmere Landfill
          |****************************************|
          |*       FILE SPECIFICATION SECTION     *|
          |****************************************|
Fa-------------------------------------|
n/a                                    * I OPT Hourly chi (surr src) file
n/a                                    * I OPT Hourly source data input file
elslft13.SEQ                           * O OPT Sequential output file
n/a                                    * O OPT Debug Output file
          |****************************************|
          |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
          |****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor leval
      1  jdetr   jdy start debug/sequential output
      1  ihatr   ihr start debug/sequential output
    366  jdetp   jdy stop debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
          |****************************************|
          |*       SOURCE-SPECIFIC MET DATA       *|
          |*          AND MODEL SECTION           *|
          |****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
          |****************************************|
          |*        Source-Specific (IGM)         *|
          |*      Meteorological Data Section     *|
          |****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
          |****************************************|
          |*           Source-Specific            *|
          |*  Regulatory Default Model Section    *|
          |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                         4=COMPLEX-I  5=RTDM  6=SHORTZ
          |****************************************|-->This section used if reg
          |*           Source-Specific            *|   def=0 or to override reg
          |*      User-Defined Model Section      *|   def w/neg # (-999 = 0)
          |****************************************|
Fa-------------------------------------|
                                       :1     User-defined description of
                                       :2     model algorithm sets
                                       :3
                                       :4
                                       :5     These 40-character descriptions
                                       :6     are informational only and may
                                       :7     be left blank
                                       :8
| General technical options         |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other then integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmina
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  hslflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
TAF D  Terrain sdjustment factor-Stability D
TAF E  Terrain adjustment factor-Stability E
TAF F  Terrain adjustment factor-Stability F
xmina  Minimum approach (meters)
xwnu   Cross sector width (n/u)
xws    Cross sector width (stable)
alpha  Parameter for BID
xmnscl Minimum height to scale to
zvfac  Factor to calc xz (1.169 is exact)
xmxmin minimum mixing height, meters (0.0=no modification)
halflf pollutant half-life in seconds (0.0=no pollutant decay)
          |*****************************************|
          |*      OPTIONAL P & PTG SECTION         *|
          |*****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF1
   .000    .000    .000    .000    .000    .000    D     iopdth=11
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF2
   .000    .000    .000    .000    .000    .000    D     iopdth=12
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF3
   .000    .000    .000    .000    .000    .000    D     iopdth=13
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
          |*****************************************|
          |*      HOURLY SOURCE DATA SECTION       *|
          |*****************************************|
Fi-----|
      0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
      0  nshsd   If ihsdat >= 1, number of sources
      0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
          |*****************************************|
          |*     OZONE LIMITING METHOD SECTION     *|
          |*****************************************|
Fi-----|
      0  iepolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
      0  nssolm  Number of surr source to use for OLM (chi by hour)
    0.0  olmval  Fixed chi value for OLM, only if nssolm=0
          |*****************************************|
          |*  HOURLY CHI/SURROGATE SOURCE SECTION  *|
          |*****************************************|
Fi-----|
      0  nssorc  Number of surrogate sources in hourly chi file
      0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
      0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name    --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
    0    0  (Surr src name)
           |****************************************|
           |* CONCENTRATION CHECK (CHICHK) SECTION *|
           |****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julien day & receptor no. combinatien to create CHICHK for
```

```
Otional Run File - Elsmere Landfill
              |***************************************|
              |*      FILE SPECIFICATION SECTION     *|
              |***************************************|
Fa-------------------------------------|
n/a                                     * I OPT Hourly chi (surr src) file
n/a                                     * I OPT Hourly source data input file
elslft2.SEQ                             * O OPT Sequential output file
n/a                                     * O OPT Debug Output file
              |***************************************|
              |*  SEQUENTIAL/DEBUG OPTIONS SECTION   *|
              |***************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdstr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy stop debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnseq  Source number for debug/sequential output (0=all sources)
      0  irnseq  (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
              |***************************************|
              |*      SOURCE-SPECIFIC MET DATA       *|
              |*         AND MODEL SECTION           *|
              |***************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
              |***************************************|
              |*       Source-Specific (IGM)         *|
              |*     Meteorological Data Section     *|
              |***************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
              |***************************************|
              |*          Source-Specific            *|
              |*  Regulatory Default Model Section   *|
              |***************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg dof: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                           4=COMPLEX-I  5=RTDM  6=SHORTZ
              |***************************************|-->This section used if reg
              |*          Source-Specific            *|   def=0 or to override reg
              |*     User-Defined Model Section      *|   daf w/neg # (-999 = 0)
              |***************************************|
Fa-------------------------------------|
                                        :1    User-dafined description of
                                        :2    model algorithm sets
                                        :3
                                        :4
                                        :5    These 40-character descriptions
                                        :6    are informational only and may
                                        :7    be left blank
                                        :8
| General technical options    |
Fi-|---|---|---|---|---|---|---|
```

```
  0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
  0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
  0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
  0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
  0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
  0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
  0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
  0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
  0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
  0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
  0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
  0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-ep)
  0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
  0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
  0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=arrey n
  0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
  0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=arrey n
  0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
  0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl atbl 2=RTDM; 3=CMPLX1
  0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
  0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
  0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
  0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
  0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
  0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
  0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
  0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
  0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
  0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
  0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
  0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmine
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  hslflf
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
    TAF D  Terrain adjustment factor-Stability D
    TAF E  Terrain adjustment factor-Stability E
    TAF F  Terrain adjustment factor-Stability F
    xmina  Minimum approach (meters)
    xwnu   Cross sector width (n/u)
    xws    Cross sector width (stable)
    alpha  Parameter for BID
    xmscl  Minimum height to scale to
    zvfac  Factor to calc xz (1.169 is exact)
    xmxmin minimum mixing height, meters (0.0=no modification)
    halflf pollutant half-life in seconds (0.0=no pollutant decay)
             |****************************************|
             |*      OPTIONAL P & PTG SECTION        *|
             |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
    1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF1
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=11
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF2
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=12
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C   :PDEF3
    0.00    0.00    0.00    0.00    0.00    0.00    D    iopp=13
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF1
    .000    .000    .000    .000    .000    .000    D    iopdth=11
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF2
    .000    .000    .000    .000    .000    .000    D    iopdth=12
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C   :DTHDEF3
    .000    .000    .000    .000    .000    .000    D    iopdth=13
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
             |****************************************|
             |*      HOURLY SOURCE DATA SECTION      *|
             |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
             |****************************************|
             |*    OZONE LIMITING METHOD SECTION     *|
             |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
             |****************************************|
             |*  HOURLY CHI/SURROGATE SOURCE SECTION *|
             |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
    0    0  (Surr src name)
            |*****************************************|
            |* CONCENTRATION CHECK (CHICHK) SECTION *|
            |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
  0    0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
IGM v. 92120 Source file converted from ISC2 input file
                |*****************************************|
                |*          FILE SIZING SECTION          *|
                |*****************************************|
Fi-----|
      0  ngroup  Number of source groups (0=each source is a group)
      0  ngtots  Number of totals (0=one total over all groups)
      0  npsorc  Number of point sources
      0  nvsorc  Number of volume sources
     22  nasorc  Number of area sources
      0  nsdsbd  Number of sets of direction-specific building dimensions
      0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
      0  nqf2    Number of "Qflag-2" arrays (vary by month)
      0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
      0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
      0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
                |*****************************************|
                |*          GROUP TOTALS SECTION         *|
                |*             (ngtots lines)            *|
                |*****************************************|
|                                       num-  Group i.d. that define total       |
|         Total Name(s)                 num   (max. 99-anter numnum/10 lines)    |
Va------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

                |*****************************************|
                |*        SOURCE GROUPING SECTION        *|
                |*             (ngroup lines)            *|
                |*****************************************|
|                                      Group  Short  -(Group # assigned to
|         Group Name(s)                 i.d. Name(s)   sh name if blank)
Va------------------------------------|i-|a------|

                |*****************************************|
                |*          POINT SOURCE SECTION         *|
                |*             (npsorc lines)            *|
                |*****************************************|
|      G        B                                                                   |
|      R M M P L Q W                  Q      XS     YS     ZS    Hs    Ts    Vs     D    HB    PW |
|SNUM  P P I R D F Q    Source Name   g/sec   (m)    (m)   (ft)   (m)   (K)  (m/s)  (m)   (m)   (m)|
Vi--|--|-|-|-|-|-|-|a-----------------|r------|------|------|-----|-----|-----|-----|-----|-----|-----|
                |*****************************************|
                |*         VOLUME SOURCE SECTION         *|
                |*             (nvsorc lines)            *|
                |*****************************************|
|        Q W                        Q      Xctr   Yctr    ZS   Hctr  SGZO  SGYO|
|SNUM  G MF Q    Source Name     (g/sec)   (m)    (m)    (ft)  (m)   (m)   (m)|
Vi--|--|-||-|a-----------------|r------|------|------|-----|-----|-----|-----|
                |*****************************************|
                |*          AREA SOURCE SECTION          *|
                |*             (nasorc lines)            *|
                |*****************************************|
|        Q W                        Q      XSw    YSw    ZS   Heff  Width|
|SNUM  G MF Q    Source Name     (g/s/m2)  (m)    (m)    (ft)  (m)   (m) |
Vi--|--|-||-|a-----------------|r-------|------|------|-----|-----|-----|
30001  4 00 0 AREA SOURC 3          1.000363250.3802375 2100.    .0  250.
30002  4 00 0 AREA SOURC 4          1.000363500.3802375 2200.    .0  250.
30003  4 00 0 AREA SOURC 5          1.000363750.3802375 2250.    .0  250.
30004  4 00 0 AREA SOURC 6          1.000364000.3802500 2200.    .0  125.
30005  4 00 0 AREA SOURC 7          1.000364125.3802500 2200.    .0  125.
30006  4 00 0 AREA SOURC 8          1.000364000.3802375 2350.    .0  125.
30007  4 00 0 AREA SOURC 9          1.000364125.3802375 2350.    .0  125.
30008  4 00 0 AREA SOURC 10         1.000364250.3802375 2350.    .0  125.
30009  4 00 0 AREA SOURC 11         1.000363000.3802125 2000.    .0  250.
30010  4 00 0 AREA SOURC 12         1.000363250.3802125 2250.    .0  250.
30011  4 00 0 AREA SOURC 13         1.000363500.3802125 2550.    .0  250.
30012  4 00 0 AREA SOURC 3          1.000363750.3802000 2600.    .0  375.
30013  4 00 0 AREA SOURC 5          1.000362875.3801688 2100.    .0  437.
30014  4 00 0 AREA SOURC 6          1.000363313.3801688 2700.    .0  437.
30015  4 00 0 AREA SOURC 10         1.000362875.3801250 2100.    .0  437.
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30016  4 00 0 AREA SOURC 11         1.000363313.3801250 2700.    .0  437.
30017  4 00 0 AREA SOURC 12         1.000363750.3801250 2950.    .0  375.
30018  4 00 0 AREA SOURC 3          1.000363000.3801000 2200.    .0  250.
30019  4 00 0 AREA SOURC 4          1.000363250.3801000 2500.    .0  250.
30020  4 00 0 AREA SOURC 7          1.000363115.3800865 2100.    .0  134.
30021  4 00 0 AREA SOURC 8          1.000362990.3800865 2350.    .0  125.
30022  4 00 0 AREA SOURC 9          1.000363250.3800875 2450.    .0  125.
|                                                                          |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  /  |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
|                                                                            .Bound|
| N=  0   SET N+1       SET N+2       SET N+3       SET N+4       SET N+5 . Wake|
|        BH    BPW     BH    BPW     BH    BPW     BH    BPW     BH    BPW.Flags|
| FV                                                                      .12345|
Bi-|r------|------|------|------|------|------|------|------|------|------||||||
  10    0.0   0.0    0.0   0.0    0.0   0.0    0.0   0.0    0.0   0.00
  20   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  30   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  40   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  50   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  60   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  70   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  80   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
  90   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 100   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 110   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 120   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 130   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 140   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 150   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 160   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 170   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 180   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 190   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 200   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 210   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 220   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 230   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 240   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 250   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 260   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 270   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 280   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 290   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 300   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 310   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 320   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 330   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 340   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 350   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 360   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
              |****************************************|
              |*        EMISSION SCALAR SECTION       *|
              |****************************************|
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
```

```
|QFLAG = 4 (Stability and wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 13-24
```

ESWMF IGM MODEL INPUT RUN FILES

PAVED HAUL ROAD

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

P:\snamdm\130\els.mdl

BKK- Elsmere Proposed Landfill

```
BKK- Elsmere Proposed Landfill
                |****************************************|
                |        FILE SPECIFICATION SECTION     *|
                |****************************************|
Fa-----------------------------------|
bkkels13.txt                          * I REQ Meteorological data input file
elsmere.rec                           * I REQ Receptor file
elsphl.SRI                            * I REQ Source file
elsphl13.RNO                          * I OPT Optional run file
n/a                                   * I OPT Terrain profiles (REQ for RTDM)
elsphl13.OFP                          * O REQ Output print file - ASCII
n/a                                   * O OPT Type C disk output - binary
n/a                                   * O OPT Detailed report file - ASCII
n/a                                   * O OPT Processed conc. output - binary
                |****************************************|
                |        GENERAL RUN SET-UP SECTION     *|
                |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill      :24-character Run i.d.
                |****************************************|
                |        PRINTOUT CONTROL SECTION       *|
                |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  ispsrc     "     "  detailed source data         y(1) n(0)
      0  ispdmo     "     "  model tech options           y(1) n(0)
      0  ispred     "     "  source/rec min. dist         y(1) n(0)
      0  ispsrg     "     "  src groups/totals summ       y(1) n(0)
      0  isppht     "     "  plume height/Hcrit tablas    y(1) n(0)
      0  ispina     "     "  interm terr summary roport   y(1) n(0)
      1  ipgc    PC(1) or meinframe(2) or no(0) paginetion in printed files
     50  linpge  Number of lines per pege
                |****************************************|
                |      POST-PROCESSING OPTIONS SECTION   |
                |****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlep,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                |****************************************|
                |*     AVERAGING TIMES OPTIONS SECTION  *|
                |****************************************|
Fi---|-----|-----|-----|
    -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
     1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
    10     0     0     0  Rank bassd (Type D)    N-hi (0=no Type D)
                |****************************************|
                |*        MODEL SELECTION SECTION       *|
                |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                If RTDM (5) selected:                                  *|
|*                  -irpro must be non-0;                                *|
|*                  -must create profile file;                           *|
|*                  -must assign profiles in source file;                *|
|*                                                                       *|
|*Reg Def Models  1 = ISCST2 Rural                                  P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)           P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                             P     *|
|*  A=area        5 = RTDM Default                                  P     *|
|*  V=volume      6 = SHORTZ Default                                P     *|
|*                                                                       *|
                |****************************************|
                |* METEOROLOGICAL DATA FORMAT SECTION   *|
                |****************************************|
```

```
Fi-----|
      -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                  2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
   10.00  ranht  Wind speed measurement height, meters
  190.00 bsmetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |***************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |***************************************|
Fi-----|
       0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |***************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS  *|
               |***************************************|
Fi-----|
       0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
       0  Grid number to select
               |***************************************|
               |*       ANALYSIS SCOPE SECTION        *|
               |*       SOURCE GROUPS & TOTALS        *|
               |***************************************|
Fi-----|
       0  ngrpsl Number of groups to select from src file (0=default to src file)
       0  ngtots Number of totals to create in this file  (0=default to src file)
               |***************************************|
               |*    Source Group Selection Section   *|
               |***************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |***************************************|
               |*         Group Totals Section        *|
               |*            (ngtots lines)           *|
               |***************************************|
|
|                                   num-  Group numbers that define total       |
|       Total Name(s)               num   (max. 99-enter numnum/10 lines)       |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |***************************************|
               |*    CONC. THRESHOLD-BASED SECTION    *|
               |*              (TYPE C)               *|
               |*         (numcsc cases/blocks)       *|
               |***************************************|
Fi-----|
       0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
    1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
       0  ktcsc   Total to which this threshold case applies
       0  ncntc   Number of threshold testing conditions (1 or 2)
       0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
       0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
       0  igwrt   Include group contributions in file & printout y(1) n(0)
       0  iusth2  Use of second threshold testing condition:
                    (1)-To create a summary ("significant impact") report that is
                        based on both concentration sums exceeding the applicable
                        threshold criteria. Concentrations written to the "Type C"
                        file, and in the detailed report (if selected), are based
                        on meeting the first threshold criterion only
                    (2)-To limit concentrations written to file, and in the
                        detailed report (if selected), to only those that meet
                        both threshold criteria
fi-----|-------|-------|-------|
       0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
     0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
     0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
BKK- Elsmere Proposed Landfill
                 |*****************************************|
                 |        FILE SPECIFICATION SECTION      *|
                 |*****************************************|
Fa-------------------------------------|
bkkels2.txt                            * I REQ Meteorological data input file
elsmere.rec                            * I REQ Receptor file
elsphl.SRI                             * I REQ Source file
elsphl2.RNO                            * I OPT Optional run file
n/a                                    * I OPT Terrain profiles (REQ for RTDM)
elsphl2.ofp                            * O REQ Output print file - ASCII
n/a                                    * O OPT Type C disk output - binary
n/a                                    * O OPT Detailed report file - ASCII
n/a                                    * O OPT Processed conc. output - binary
                 |*****************************************|
                 |        GENERAL RUN SET-UP SECTION      *|
                 |*****************************************|
Fi-----|
      1  istask  Step & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa-----------------------|
   Elsmere Landfill       :24-character Run i.d.
                 |*****************************************|
                 |         PRINTOUT CONTROL SECTION       *|
                 |*****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprop  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprc      "     "  detailed source data         y(1) n(0)
      0  ispdmo     "     "  model tech options           y(1) n(0)
      0  isprsd     "     "  source/rec min. dist         y(1) n(0)
      0  ispsrg     "     "  src groups/totals summ       y(1) n(0)
      0  isppht     "     "  plume height/Hcrit tables    y(1) n(0)
      0  ispina     "     "  interm terr summary report   y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                 |*****************************************|
                 |      POST-PROCESSING OPTIONS SECTION    |
                 |*****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                 |*****************************************|
                 |*   AVERAGING TIMES OPTIONS SECTION     *|
                 |*****************************************|
Fi---|-----|-----|-----|
    -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
     1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
    10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                 |*****************************************|
                 |*       MODEL SELECTION SECTION         *|
                 |*****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                  If RTDM (5) selected:                                  *|
|*                    -irpro must be non-0;                                *|
|*                    -must create profile file;                           *|
|*                    -must assign profiles in source file;                *|
|*                                                                         *|
|*Reg Def Models  1 = ISCST2 Rural                                  P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)           P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                             P     *|
|*  A=area        5 = RTDM Default                                  P     *|
|*  V=volume      6 = SHORTZ Default                                P     *|
|*                                                                        *|
                 |*****************************************|
                 |* METEOROLOGICAL DATA FORMAT SECTION    *|
                 |*****************************************|
```

```
Fi-----|
      -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                           2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
   10.00  ranht  Wind speed measurement height, meters
  190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |*****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |*****************************************|
Fi-----|
       0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |*****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |*****************************************|
Fi-----|
       0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
       0  Grid number to select
               |*****************************************|
               |*        ANALYSIS SCOPE SECTION          *|
               |*        SOURCE GROUPS & TOTALS          *|
               |*****************************************|
Fi-----|
       0  ngrpsl Number of groups to select from src file (0=default to src file)
       0  ngtots Number of totals to create in this file  (0=default to src file)
               |*****************************************|
               |*    Source Group Selection Section     *|
               |*****************************************|

|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |*****************************************|
               |*          Group Totals Section          *|
               |*            (ngtots lines)              *|
               |*****************************************|
|
|                                       num-  Group numbers that define total      |
|        Total Name(s)                  num   (max. 99-enter numnum/10 lines)       |
Va-------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|---|

               |*****************************************|
               |*    CONC. THRESHOLD-BASED SECTION       *|
               |*             (TYPE C)                   *|
               |*        (numcsc cases/blocks)           *|
               |*****************************************|
Fi-----|
       0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
    1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
       0  ktcsc   Total to which this threshold case applies
       0  ncntc   Number of threshold testing conditions (1 or 2)
       0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
       0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
       0  igwrt   Include group contributions in file & printout y(1) n(0)
       0  iusth2  Use of second threshold testing condition:
                    (1)-To create a summary ("significant impact") report that is
                        based on both concentration sums exceeding the applicable
                        threshold criteria. Concentrations written to the "Type C"
                        file, and in the detailed report (if selected), are based
                        on meeting the first threshold criterion only
                    (2)-To limit concentrations written to file, and in the
                        detailed report (if selected), to only those that meet
                        both threshold criteria
fi-----|-------|-------|-------|
       0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
     0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
     0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
Otionsl Run File - Elsmere Landfill
                 |*****************************************|
                 |*      FILE SPECIFICATION SECTION       *|
                 |*****************************************|
Fa-----------------------------------|
n/a                                   * I OPT Hourly chi (surr src) file
n/a                                   * I OPT Hourly source data input file
elsphl13.SEQ                          * O OPT Sequential output file
n/a                                   * O OPT Debug Output file
                 |*****************************************|
                 |*  SEQUENTIAL/DEBUG OPTIONS SECTION     *|
                 |*****************************************|
Fi-----|
      1 iopdsq  Sequential output? n(0) y-concentrations(1) y-detailsd(2)
      0 idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1 jdatr   jdy start debug/sequential output
      1 ihstr   ihr start debug/sequential output
    366 jdstp   jdy stop debug/sequential output
     24 ihstp   ihr stop debug/sequential output
      0 isnsq   Source number for debug/sequential output (0=all sources)
      0 irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0 iprndx  Printout index calculations y(1) n(0)
                 |*****************************************|
                 |*      SOURCE-SPECIFIC MET DATA         *|
                 |*         AND MODEL SECTION             *|
                 |*****************************************|
Fi-----|
      0 modset  Use algorithm sets and assign at source level y(1) n(0)
      0 iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
                 |*****************************************|
                 |*        Source-Specific (IGM)          *|
                 |*     Meteorological Data Section       *|
                 |*****************************************|
Fi-----|
      7 nfield  (IGM format) met data input, number of fields
      0 iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0 nlvpro  ws/wd profiles: number of levels
      0 ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0 stpro   ws/wd profiles: height of first profile level (m)
    0.0 proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm dsf.)
    htmets: height of wind spd measurement (meters)
                 |*****************************************|
                 |*           Source-Specific             *|
                 |*   Regulatory Default Model Section    *|
                 |*****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                          4=COMPLEX-I  5=RTDM  6=SHORTZ
                 |*****************************************|-->This section used if reg
                 |*           Source-Specific             *|   dsf=0 or to override reg
                 |*     User-Defined Model Section        *|   dsf w/neg # (-999 = 0)
                 |*****************************************|
Fa-----------------------------------|
                                      :1     User-defined description of
                                      :2     model algorithm sets
                                      :3
                                      :4
                                      :5     These 40-character descriptions
                                      :6     are informational only and may
                                      :7     be left blank
                                      :8
| General technical options        |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopukf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
   0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmina
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
  TAF D  Terrain adjustment factor-Stability D
  TAF E  Terrain adjustment factor-Stability E
  TAF F  Terrain adjustment factor-Stability F
  xmina  Minimum approach (meters)
  xwnu   Cross sector width (n/u)
  xws    Cross sector width (stable)
  alpha  Parameter for BID
  xmnscl Minimum height to scale to
  zvfac  Factor to calc xz (1.169 is exact)
  xmxmin minimum mixing height, meters (0.0=no modification)
  halflf pollutent half-life in seconds (0.0=no pollutant decay)
             |****************************************|
             |*     OPTIONAL P & PTG SECTION         *|
             |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
    1.54    3.09    5.14    8.23    10.8    : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF1
    .000    .000    .000    .000    .000    .000    D     iopdth=11
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF2
    .000    .000    .000    .000    .000    .000    D     iopdth=12
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF3
    .000    .000    .000    .000    .000    .000    D     iopdth=13
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
             |*****************************************|
             |*     HOURLY SOURCE DATA SECTION        *|
             |*****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
             |*****************************************|
             |*   OZONE LIMITING METHOD SECTION       *|
             |*****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
             |*****************************************|
             |*  HOURLY CHI/SURROGATE SOURCE SECTION  *|
             |*****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a-----------------| --> nssorc lines
    0    0  (Surr src name)
            |****************************************|
            |* CONCENTRATION CHECK (CHICHK) SECTION *|
            |****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
Otional Run File - Elsmere Landfill
               |****************************************|
               |*      FILE SPECIFICATION SECTION      *|
               |****************************************|
Fa-----------------------------------|
n/a                                  * I OPT Hourly chi (surr src) file
n/a                                  * I OPT Hourly source data input file
elsphl2.SEQ                          * O OPT Sequential output file
n/a                                  * O OPT Debug Output file
               |****************************************|
               |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
               |****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdstr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy step debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
               |****************************************|
               |*      SOURCE-SPECIFIC MET DATA        *|
               |*         AND MODEL SECTION            *|
               |****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
               |****************************************|
               |*        Source-Specific (IGM)         *|
               |*      Meteorological Data Section     *|
               |****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
               |****************************************|
               |*           Source-Specific            *|
               |*  Regulatory Default Model Section    *|
               |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                          4=COMPLEX-I  5=RTDM  6=SHORTZ
               |****************************************|-->This section used if reg
               |*           Source-Specific            *|   daf=0 or to override reg
               |*      User-Defined Model Section      *|   def w/neg # (-999 = 0)
               |****************************************|
Fa-----------------------------------|
                                      :1     User-defined description of
                                      :2     model algorithm sets
                                      :3
                                      :4
                                      :5     These 40-character descriptions
                                      :6     are informational only and may
                                      :7     be left blank
                                      :8

| General technical options     |
Fi-|---|---|---|---|---|---|---|
```

```
   0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
   0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
   0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
   0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
   0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
   0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
   0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
   0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
   0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
   0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
   0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
   0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
   0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
   0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
   0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
   0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
   0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
   0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
   0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
   0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=arrey n
   0   0   0   0   0   0   0   0  ifed    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
   0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
   0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
   0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
   0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
   0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
   0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
   0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
   0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
   0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
   0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
   0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
   0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intonsity
   0   0   0   0   0   0   0   0  ifhrsa  Field for hourly vert turb intensity
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
   0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmine
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
     0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
  TAF D  Terrain adjustment factor-Stability D
  TAF E  Terrain adjustment factor-Stability E
  TAF F  Terrain adjustment factor-Stability F
  xmina  Minimum approach (meters)
  xwnu   Cross sector width (n/u)
  xws    Cross sector width (stable)
  alpha  Parameter for BID
  xmnscl Minimum height to scale to
  zvfac  Factor to calc xz (1.169 is exact)
  xmxmin minimum mixing height, meters (0.0=no modification)
  halflf pollutant half-life in seconds (0.0=no pollutant decay)
            |****************************************|
            |*     OPTIONAL P & PTG SECTION          *|
            |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
    1.54    3.09    5.14    8.23    10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    0.00    0.00    0.00    0.00    0.00    0.00    A
    0.00    0.00    0.00    0.00    0.00    0.00    B
    0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
    0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
    0.00    0.00    0.00    0.00    0.00    0.00    E
    0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF1
    .000    .000    .000    .000    .000    .000    D     iopdth=11
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF2
    .000    .000    .000    .000    .000    .000    D     iopdth=12
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
    .000    .000    .000    .000    .000    .000    A
    .000    .000    .000    .000    .000    .000    B
    .000    .000    .000    .000    .000    .000    C    :DTHDEF3
    .000    .000    .000    .000    .000    .000    D     iopdth=13
    .000    .000    .000    .000    .000    .000    E
    .000    .000    .000    .000    .000    .000    F
            |****************************************|
            |*     HOURLY SOURCE DATA SECTION        *|
            |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
            |****************************************|
            |*   OZONE LIMITING METHOD SECTION       *|
            |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
            |****************************************|
            |* HOURLY CHI/SURROGATE SOURCE SECTION   *|
            |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name    --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a-----------------| --> nssorc lines
    0    0  (Surr src name)
             |*****************************************|
             |* CONCENTRATION CHECK (CHICHK) SECTION *|
             |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
IGM v. 92120 Source file converted from ISC2 input file
                    |**************************************|
                    |*          FILE SIZING SECTION        *|
                    |**************************************|
Fi-----|
      0  ngroup  Number of source groups (0=each source is a group)
      0  ngtots  Number of totals (0=one total over all groups)
      0  npsorc  Number of point sources
     76  nvsorc  Number of volume sources
      0  nasorc  Number of area sources
      0  nsdsbd  Number of sets of direction-specific building dimensions
      0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
      0  nqf2    Number of "Qflag-2" arrays (vary by month)
      0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
      0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
      0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
                    |**************************************|
                    |*         GROUP TOTALS SECTION        *|
                    |*           (ngtots lines)            *|
                    |**************************************|
|                                    num-  Group i.d. that define total       |
|          Total Name(s)             num   (max. 99-anter numnum/10 lines)    |
Va----------------------------------|||--|---|---|---|---|---|---|---|---|---|

                    |**************************************|
                    |*       SOURCE GROUPING SECTION       *|
                    |*           (ngroup lines)            *|
                    |**************************************|
|                                  Group  Short  -(Group # assigned to
|          Group Name(s)            i.d. Name(s)   sh name if blank)
Va----------------------------------|i-|a------|

                    |**************************************|
                    |*        POINT SOURCE SECTION         *|
                    |*           (npsorc lines)            *|
                    |**************************************|
|      G       B                                                                          |
|      R M M P L Q W                   Q       XS      YS      ZS     Hs     Ts     Vs     D     HB     PW |
|SNUM  P P I R D F Q    Source Name    g/sec   (m)     (m)    (ft)   (m)    (K)   (m/s)   (m)   (m)    (m)|
Vi--|--|-|-|-|-|-|-|a-----------------|r------|------|-------|-----|-----|-----|-----|-----|-----|-----|
                    |**************************************|
                    |*        VOLUME SOURCE SECTION        *|
                    |*           (nvsorc lines)            *|
                    |**************************************|
|       Q W                             Q      Xctr    Yctr    ZS   Hctr  SGZ0  SGY0|
|SNUM  G NF Q     Source Name       (g/sec)    (m)     (m)    (ft)   (m)   (m)   (m)|
Vi--|--|-||-|a------------------|r-------|------|------|-----|-----|-----|-----|
20001  2 00 0 VOLUME SRC 14          1.0000361761.3802102 1641.   1.5 1.39537.814
20002  2 00 0 VOLUME SRC 15          1.0000361769.3802193 1686.   1.5 1.39537.814
20003  2 00 0 VOLUME SRC 16          1.0000361762.3802276 1645.   1.5 1.39537.814
20004  2 00 0 VOLUME SRC 17          1.0000361745.3802361 1672.   1.5 1.39537.814
20005  2 00 0 VOLUME SRC 18          1.0000361726.3802442 1655.   1.5 1.39537.814
20006  2 00 0 VOLUME SRC 19          1.0000361712.3802507 1686.   1.5 1.39537.814
20007  2 00 0 VOLUME SRC 20          1.0000361710.3802567 1666.   1.5 1.39537.814
20008  2 00 0 VOLUME SRC 21          1.0000361753.3802624 1670.   1.5 1.39537.814
20009  2 00 0 VOLUME SRC 22          1.0000361809.3802637 1735.   1.5 1.39537.814
20010  2 00 0 VOLUME SRC 23          1.0000361859.3802618 1771.   1.5 1.39537.814
20011  2 00 0 VOLUME SRC 24          1.0000361894.3802568 1813.   1.5 1.39537.814
20012  2 00 0 VOLUME SRC 25          1.0000361898.3802485 1894.   1.5 1.39537.814
20013  2 00 0 VOLUME SRC 26          1.0000361903.3802400 1850.   1.5 1.39537.814
20014  2 00 0 VOLUME SRC 28          1.0000361918.3802337 1773.   1.5 1.39537.814
20015  2 00 0 VOLUME SRC 29          1.0000361943.3802276 1737.   1.5 1.39537.814
20016  2 00 0 VOLUME SRC 30          1.0000361974.3802200 1791.   1.5 1.39537.814
20017  2 00 0 VOLUME SRC 31          1.0000362007.3802118 1899.   1.5 1.39537.814
20018  2 00 0 VOLUME SRC 32          1.0000362036.3802050 1944.   1.5 1.39537.814
20019  2 00 0 VOLUME SRC 33          1.0000362068.3801970 1944.   1.5 1.39537.814
20020  2 00 0 VOLUME SRC 34          1.0000362100.3801896 1881.   1.5 1.39537.814
20021  2 00 0 VOLUME SRC 35          1.0000362143.3801830 1920.   1.5 1.39537.814
20022  2 00 0 VOLUME SRC 36          1.0000362209.3801776 2044.   1.5 1.39537.814
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20023  2 00 0 VOLUME SRC 37         1.0000362283.3801751 2063.    1.5 1.39537.814
20024  2 00 0 VOLUME SRC 38         1.0000362376.3801752 1946.    1.5 1.39537.814
20025  2 00 0 VOLUME SRC 39         1.0000362453.3801760 1917.    1.5 1.39537.814
20026  2 00 0 VOLUME SRC 40         1.0000362346.3801773 1881.    1.5 1.39537.814
20028  2 00 0 VOLUME SRC 41         1.0000362621.3801782 1852.    1.5 1.39537.814
20029  2 00 0 VOLUME SRC 42         1.0000362710.3801794 1796.    1.5 1.39537.814
20030  2 00 0 VOLUME SRC 43         1.0000362793.3801803 1781.    1.5 1.39537.814
20031  2 00 0 VOLUME SRC 44         1.0000362871.3801814 1897.    1.5 1.39537.814
20032  2 00 0 VOLUME SRC 45         1.0000362953.3801821 1918.    1.5 1.39537.814
20033  2 00 0 VOLUME SRC 46         1.0000362995.3801903 1733.    1.5 1.39537.814
20034  2 00 0 VOLUME SRC 47         1.0000363027.3801971 1685.    1.5 1.39537.814
20035  2 00 0 VOLUME SRC 48         1.0000363090.3802027 1700.    1.5 1.39537.814
20036  2 00 0 VOLUME SRC 49         1.0000363136.3802084 1740.    1.5 1.39537.814
20037  2 00 0 VOLUME SRC 50         1.0000363167.3802155 1687.    1.5 1.39537.814
20038  2 00 0 VOLUME SRC 51         1.0000363206.3802232 1747.    1.5 1.39537.814
20039  2 00 0 VOLUME SRC 52         1.0000363257.3802298 1779.    1.5 1.39537.814
20040  2 00 0 VOLUME SRC 53         1.0000363301.3802367 1782.    1.5 1.39537.814
20041  2 00 0 VOLUME SRC 54         1.0000363380.3802400 1766.    1.5 1.39537.814
20042  2 00 0 VOLUME SRC 56         1.0000363457.3802397 1854.    1.5 1.39537.814
20043  2 00 0 VOLUME SRC 55         1.0000363527.3802455 1827.    1.5 1.39537.814
20044  2 00 0 VOLUME SRC 56         1.0000363586.3802506 1852.    1.5 1.39537.814
20045  2 00 0 VOLUME SRC 57         1.0000363675.3802519 1962.    1.5 1.39537.814
20046  2 00 0 VOLUME SRC 58         1.0000363756.3802510 2017.    1.5 1.39537.814
20047  2 00 0 VOLUME SRC 59         1.0000363841.3802503 2093.    1.5 1.39537.814
20048  2 00 0 VOLUME SRC 60         1.0000363924.3802498 2184.    1.5 1.39537.814
20049  2 00 0 VOLUME SRC 61         1.0000364017.3802493 2243.    1.5 1.39537.814
20050  2 00 0 VOLUME SRC 62         1.0000364097.3802483 2327.    1.5 1.39537.814
20051  2 00 0 VOLUME SRC 63         1.0000364184.3802465 2261.    1.5 1.39537.814
20052  2 00 0 VOLUME SRC 64         1.0000364258.3802449 2251.    1.5 1.39537.814
20053  2 00 0 VOLUME SRC 65         1.0000364348.3802431 2341.    1.5 1.39537.814
20054  2 00 0 VOLUME SRC 66         1.0000364383.3802389 2359.    1.5 1.39537.814
20056  2 00 0 VOLUME SRC 67         1.0000364332.3802350 2305.    1.5 1.39537.814
20055  2 00 0 VOLUME SRC 68         1.0000364255.3802343 2340.    1.5 1.39537.814
20056  2 00 0 VOLUME SRC 69         1.0000364180.3802337 2427.    1.5 1.39537.814
20057  2 00 0 VOLUME SRC 70         1.0000364097.3802329 2480.    1.5 1.39537.814
20058  2 00 0 VOLUME SRC 71         1.0000364014.3802303 2384.    1.5 1.39537.814
20059  2 00 0 VOLUME SRC 72         1.0000363940.3802283 2329.    1.5 1.39537.814
20060  2 00 0 VOLUME SRC 73         1.0000363870.3802261 2263.    1.5 1.39537.814
20061  2 00 0 VOLUME SRC 74         1.0000363792.3802232 2206.    1.5 1.39537.814
20062  2 00 0 VOLUME SRC 75         1.0000363739.3802160 2163.    1.5 1.39537.814
20063  2 00 0 VOLUME SRC 76         1.0000363699.3802098 2103.    1.5 1.39537.814
20064  2 00 0 VOLUME SRC 77         1.0000363660.3802032 2071.    1.5 1.39537.814
20065  2 00 0 VOLUME SRC 78         1.0000363654.3801941 2185.    1.5 1.39537.814
20066  2 00 0 VOLUME SRC 79         1.0000363654.3801857 2240.    1.5 1.39537.814
20067  2 00 0 VOLUME SRC 80         1.0000363673.3801774 2282.    1.5 1.39537.814
20068  2 00 0 VOLUME SRC 81         1.0000363670.3801696 2326.    1.5 1.39537.814
20069  2 00 0 VOLUME SRC 82         1.0000363660.3801611 2305.    1.5 1.39537.814
20070  2 00 0 VOLUME SRC 83         1.0000363658.3801526 2286.    1.5 1.39537.814
20071  2 00 0 VOLUME SRC 84         1.0000363643.3801447 2284.    1.5 1.39537.814
20072  2 00 0 VOLUME SRC 85         1.0000363660.3801361 2364.    1.5 1.39537.814
20073  2 00 0 VOLUME SRC 86         1.0000363661.3801288 2410.    1.5 1.39537.814
20074  2 00 0 VOLUME SRC 87         1.0000363697.3801221 2428.    1.5 1.39537.814
20075  2 00 0 VOLUME SRC 88         1.0000363731.3801153 2478.    1.5 1.39537.814
20076  2 00 0 VOLUME SRC 89         1.0000363765.3801088 2554.    1.5 1.39537.814
                     |**************************************|
                     |*            AREA SOURCE SECTION     *|
                     |*             (nasorc lines)         *|
                     |**************************************|
|         Q W                          Q      XSw     YSw     ZS   Heff  Width|
|SNUM  G MF Q     Source Name      (g/s/m2)   (m)     (m)    (ft)   (m)   (m) |
Vi--|--|-||-|a------------------|r-------|-------|-------|------|------|-----|
|                                                                              |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  / |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
|                                                                            .Bound|
| N=  0   SET N+1       SET N+2        SET N+3        SET N+4        SET N+5 . Wake|
|         BH     BPW     BH     BPW     BH     BPW     BH     BPW     BH    BPW.Flags|
| FV                                                                         .12345|
```

```
Bi-|r------|------|-------|------|-------|------|-------|------|-------|------||||||
 10    0.0    0.0     0.0    0.0     0.0    0.0     0.0    0.0     0.0    0.00
 20   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 30   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 40   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 50   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 60   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 70   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 80   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
 90   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
100   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
110   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
120   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
130   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
140   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
150   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
160   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
170   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
180   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
190   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
200   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
210   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
220   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
230   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
240   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
250   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
260   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
270   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
280   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
290   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
300   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
310   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
320   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
330   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
340   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
350   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
360   -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.00
            |****************************************|
            |*      EMISSION SCALAR SECTION         *|
            |****************************************|
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
|QFLAG = 4 (Stability and wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 13-24
```

ESWMF IGM MODEL INPUT RUN FILES
PAVED HAUL ROAD

- **Model Run (2)**
- **Optional Model Run (2)**
- **Source File (1)**

```
BKK- Elsmere Proposed Landfill
                  |****************************************|
                  |       FILE SPECIFICATION SECTION      *|
                  |****************************************|
Fa-----------------------------------|
bkkels13.txt                          * I REQ Meteorological data input file
elsmere.rec                           * I REQ Receptor file
elsuhl.sri                            * I REQ Source file
elsuhl13.rno                          * I OPT Optional run file
n/a                                   * I OPT Terrain profiles (REQ for RTDM)
elsuhl13.ofp                          * O REQ Output print file - ASCII
n/a                                   * O OPT Type C disk output - binary
n/a                                   * O OPT Detailed report file - ASCII
n/a                                   * O OPT Processed conc. output - binary
                  |****************************************|
                  |       GENERAL RUN SET-UP SECTION      *|
                  |****************************************|
Fi-----|
       1  istask  Stop & ask (0) or proceed directly (1)
       0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
       1  ioprno  Use optional run file y(1) or n(0)
Fa-------------------|
   Elsmere Landfill        :24-character Run i.d.
                  |****************************************|
                  |        PRINTOUT CONTROL SECTION       *|
                  |****************************************|
Fi-----|
       1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
       0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
       0  isprop  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
       0  isperc      "    "  detailed source data        y(1) n(0)
       0  ispdmo      "    "  model tech options          y(1) n(0)
       0  isprsd      "    "  source/rec min. dist        y(1) n(0)
       0  isperg      "    "  src groups/totals summ      y(1) n(0)
       0  isppht      "    "  plume height/Hcrit tables   y(1) n(0)
       0  iepins      "    "  interm terr summary report  y(1) n(0)
       1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
      50  linpge  Number of lines per page
                  |****************************************|
                  |     POST-PROCESSING OPTIONS SECTION    |
                  |****************************************|
Fi-----|
       0  iopde   Disk output (processed) yes(1); no(0)
       0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
       0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
       0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                  |****************************************|
                  |*  AVERAGING TIMES OPTIONS SECTION     *|
                  |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)    N-hi (0=no Type D)
                  |****************************************|
                  |*       MODEL SELECTION SECTION        *|
                  |****************************************|
Fi-----|
       1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
       4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
       0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                 If RTDM (5) selected:                                 *|
|*                   -irpro must be non-0;                               *|
|*                   -must create profile file;                          *|
|*                   -must assign profiles in source file;               *|
|*                                                                       *|
|*Reg Def Models  1 = ISCST2 Rural                               P A V *|
|* & appropriate  2 = ISCST2 URBAN - SO2 (4-hr half life)        P A V *|
|* source types   3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point       4 = COMPLEX-I (Rural)                          P     *|
|*  A=area        5 = RTDM Default                               P     *|
|*  V=volume      6 = SHORTZ Default                             P     *|
|*                                                                     *|
                  |****************************************|
                  |* METEOROLOGICAL DATA FORMAT SECTION   *|
                  |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
  10.00  ranht  Wind speed measurement height, meters
 190.00 bsmetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1  0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS  *|
               |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*        ANALYSIS SCOPE SECTION        *|
               |*        SOURCE GROUPS & TOTALS        *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*    Source Group Selection Section    *|
               |****************************************|

|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*         Group Totals Section         *|
               |*           (ngtots lines)             *|
               |****************************************|

|                                       num-  Group numbers that define total   |
          Total Name(s)                 num   (max. 99-enter numnum/10 lines)   |
Va--------------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*     CONC. THRESHOLD-BASED SECTION    *|
               |*               (TYPE C)               *|
               |*         (numcsc cases/blocks)        *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

BKK- Elsmere Proposed Landfill

```
                    |****************************************|
                    |       FILE SPECIFICATION SECTION      *|
                    |****************************************|
Fa-----------------------------------|
bkkels2.txt                          * I REQ Meteorological data input file
elsmere.rec                          * I REQ Receptor file
elsuhl.sri                           * I REQ Source file
elsuhl2.rno                          * I OPT Optional run file
n/a                                  * I OPT Terrain profiles (REQ for RTDM)
elsuhl2.ofp                          * O REQ Output print file - ASCII
n/a                                  * O OPT Type C disk output - binary
n/a                                  * O OPT Detailed report file - ASCII
n/a                                  * O OPT Processed conc. output - binary
                    |****************************************|
                    |       GENERAL RUN SET-UP SECTION      *|
                    |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa-------------------|
   Elsmere Landfill       :24-character Run i.d.
                    |****************************************|
                    |         PRINTOUT CONTROL SECTION      *|
                    |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprop  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isprc       "     "  detailed source data        y(1) n(0)
      0  ispdmo      "     "  model tech options          y(1) n(0)
      0  isprsd      "     "  source/rec min. dist        y(1) n(0)
      0  isperg      "     "  src groups/totals summ      y(1) n(0)
      0  isppht      "     "  plume height/Hcrit tables   y(1) n(0)
      0  ispins      "     "  interm terr summary report  y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                    |****************************************|
                    |     POST-PROCESSING OPTIONS SECTION    |
                    |****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                    |****************************************|
                    |*   AVERAGING TIMES OPTIONS SECTION    *|
                    |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)    N-hi (0=no Type D)
                    |****************************************|
                    |*        MODEL SELECTION SECTION       *|
                    |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                  If RTDM (5) selected:                                      *|
|*                    -irpro must be non-0;                                    *|
|*                    -must create profile file;                               *|
|*                    -must assign profiles in source file;                    *|
|*                                                                             *|
|*Reg Def Models   1 = ISCST2 Rural                                   P A V    *|
|* & appropriate   2 = ISCST2 URBAN - SO2 (4-hr half life)            P A V    *|
|* source types    3 = ISCST2 URBAN - Other pollutants (no half-life)P A V     *|
|*  P=point        4 = COMPLEX-I (Rural)                              P        *|
|*  A=area         5 = RTDM Default                                   P        *|
|*  V=volume       6 = SHORTZ Default                                 P        *|
|*                                                                             *|
                    |****************************************|
                    |* METEOROLOGICAL DATA FORMAT SECTION   *|
                    |****************************************|
```

```
BKK- Elsmere Proposed Landfill
                 |****************************************|
                 |       FILE SPECIFICATION SECTION      *|
                 |****************************************|
Fa-------------------------------------|
bkkels2.txt                            * I REQ Meteorological data input file
elsmere.rec                            * I REQ Receptor file
elsanc.SRI                             * I REQ Source file
elsanc2.RNO                            * I OPT Optional run file
n/a                                    * I OPT Terrain profiles (REQ for RTDM)
elsanc2.OFP                            * O REQ Output print file - ASCII
n/a                                    * O OPT Type C disk output - binary
n/a                                    * O OPT Detailed report file - ASCII
n/a                                    * O OPT Processed conc. output - binary
                 |****************************************|
                 |       GENERAL RUN SET-UP SECTION      *|
                 |****************************************|
Fi-----|
      1  istask  Stop & ask (0) or proceed directly (1)
      0  istat   Status: -1=none, 0=screen only, 1=day, 2=hr, 3=srce, 4=rec;
      1  ioprno  Use optional run file y(1) or n(0)
Fa--------------------|
   Elsmere Landfill       :24-character Run i.d.
                 |****************************************|
                 |        PRINTOUT CONTROL SECTION       *|
                 |****************************************|
Fi-----|
      1  iopdet  Detailed reports? y(1) n(0) sep(2) (incl.mn excl.-mn)|m=1or2
      0  iprgrp  Print source groups together(0) or separately(1)     |n=1,2or3
      0  isprcp  Suppress prt detailed receptor data      y(1) n(0)   | =B,DorC
      0  isperc     "     "  detailed source data         y(1) n(0)
      0  ispdmo     "     "  model tech options           y(1) n(0)
      0  isprsd     "     "  source/rec min. dist         y(1) n(0)
      0  isperg     "     "  src groups/totals summ       y(1) n(0)
      0  isppht     "     "  plume height/Hcrit tables    y(1) n(0)
      0  ispina     "     "  interm terr summary report   y(1) n(0)
      1  ipgc    PC(1) or mainframe(2) or no(0) pagination in printed files
     50  linpge  Number of lines per page
                 |****************************************|
                 |     POST-PROCESSING OPTIONS SECTION    |
                 |****************************************|
Fi-----|
      0  iopde   Disk output (processed) yes(1); no(0)
      0  ichrep  "Concentration check" for rec. based (Type B) n(0) y(1) y-disk only(2)
      0  irunav  Running avg for <=24hr avg: y(1) n(0) y/no overlap,Type B (2)
      0  itgast  Rank-based (Type D) outputs for groups as well as totals y(1) n(0)
                 |****************************************|
                 |*   AVERAGING TIMES OPTIONS SECTION    *|
                 |****************************************|
Fi---|-----|-----|-----|
   -1     0     0     0  Avg times selected (4 allowed, must be div. into 24; -1=time period avg)
    1     0     0     0  Receptor based (Type B) N-hi (0=no Type B; must be 1 for time period avg)
   10     0     0     0  Rank based (Type D)     N-hi (0=no Type D)
                 |****************************************|
                 |*        MODEL SELECTION SECTION       *|
                 |****************************************|
Fi-----|
      1  ipmod  Primary model (reg def) for all sources: 1-6 (see below)
      4  ismod  Optional model for intermediate terrain: 0=none, 4,5 or 6: see below
      0  irpro  Number of RTDM terrain profiles (max. ipromx in pro.cmn; nominally 20)
|*                     If RTDM (5) selected:                                   *|
|*                       -irpro must be non-0;                                 *|
|*                       -must create profile file;                            *|
|*                       -must assign profiles in source file;                 *|
|*                                                                             *|
|*Reg Def Models   1 = ISCST2 Rural                                       P A V *|
|* & appropriate   2 = ISCST2 URBAN - SO2 (4-hr half life)                P A V *|
|* source types    3 = ISCST2 URBAN - Other pollutants (no half-life)P A V *|
|*  P=point        4 = COMPLEX-I (Rural)                                  P     *|
|*  A=area         5 = RTDM Default                                       P     *|
|*  V=volume       6 = SHORTZ Default                                     P     *|
|*                                                                             *|
                 |****************************************|
                 |* METEOROLOGICAL DATA FORMAT SECTION   *|
                 |****************************************|
```

```
Fi-----|
     -2  iopfm  Met data format: 1=RAMMET unformatted; -1=RAMMET binary
                                 2=IGM Hourly-ASCII;   -2=ISCST2 default ASCII
Fr-----|
   10.00  ranht  Wind speed measurement height, meters
  190.00 bemetf  Base elevation of met measurements (feet); applicable only with SHORTZ
               |****************************************|
               |* ANALYSIS SCOPE SECTION: METEOROLOGY *|
               |****************************************|
Fi-----|
      0  njdyp  Number of jdys or ranges to process (0=process all met data)
Vi-|---|  -->enter njdyp lines below in ascending order;
   1   0  jdp1,jdp2: if jdp2=0, jdp1 is indiv day, otherwise, range jdp1-jdp2
               |****************************************|
               |*  ANALYSIS SCOPE SECTION: RECEPTORS   *|
               |****************************************|
Fi-----|
      0  ngrslc Number of grids to select from rec file (0=default to receptor file)
Vi-----|  -->enter ngrslc lines
      0  Grid number to select
               |****************************************|
               |*       ANALYSIS SCOPE SECTION         *|
               |*       SOURCE GROUPS & TOTALS         *|
               |****************************************|
Fi-----|
      0  ngrpsl Number of groups to select from src file (0=default to src file)
      0  ngtots Number of totals to create in this file  (0=default to src file)
               |****************************************|
               |*    Source Group Selection Section    *|
               |****************************************|
|
|Group  Source--->A non-zero source i.d. will create a new group with this
| i.d.   i.d.     one source (cannot add groups if ngroup in src file is 0)
Vi---|i----|  -->enter ngrpsl lines
               |****************************************|
               |*         Group Totals Section         *|
               |*            (ngtots lines)            *|
               |****************************************|
|
|                                   num-  Group numbers that define total       |
|         Total Name(s)             num   (max. 99-enter numnum/10 lines)       |
Va-----------------------------------|i|i--|---|---|---|---|---|---|---|---|---|

               |****************************************|
               |*     CONC. THRESHOLD-BASED SECTION    *|
               |*              (TYPE C)                *|
               |*        (numcsc cases/blocks)         *|
               |****************************************|
Fi-----|
      0  numcsc  Number of conc. threshold-based cases (max numcmx in tpc.cmn; nominally 10)
   1000  maxtpc  Maximum allowed size of threshold-based (Type C) file, K-bytes
Bi-----|  ---> numcsc blocks
      0  ktcsc   Total to which this threshold case applies
      0  ncntc   Number of threshold testing conditions (1 or 2)
      0  ngrc1   Number of groups to sum for condition 1 (0=all grps in total)
      0  ngrc2   Number of groups to sum for condition 2 (0=all grps in total)
      0  igwrt   Include group contributions in file & printout y(1) n(0)
      0  iusth2  Use of second threshold testing condition:
                   (1)-To create a summary ("significant impact") report that is
                       based on both concentration sums exceeding the applicable
                       threshold criteria. Concentrations written to the "Type C"
                       file, and in the detailed report (if selected), are based
                       on meeting the first threshold criterion only
                   (2)-To limit concentrations written to file, and in the
                       detailed report (if selected), to only those that meet
                       both threshold criteria
fi-----|-------|-------|-------|
      0       0       0       0  Averaging period: 1 (process) or 0 (do not)
fr-----|-------|-------|-------|
    0.0     0.0     0.0     0.0  Threshold chi, cond. 1 (negative=test abs val)
    0.0     0.0     0.0     0.0  Threshold chi, cond. 2 (negative not allowed)
vi-|---|---|---|---|---|---|---|---|---|---| ->Group ids for ngrc1/2 not = 0
   0   0   0   0   0   0   0   0   0   0 cond 1 (repeat lines as necessary)
   0   0   0   0   0   0   0   0   0   0 cond 2 (repeat lines as necessary)
```

```
Otional Run File - Elamere Landfill
                  |*****************************************|
                  |*      FILE SPECIFICATION SECTION       *|
                  |*****************************************|
Fa-------------------------------------|
n/a                                     * I OPT Hourly chi (surr src) file
n/a                                     * I OPT Hourly source data input file
elsuhl13.SEQ                            * O OPT Sequential output file
n/a                                     * O OPT Debug Output file
                  |*****************************************|
                  |*  SEQUENTIAL/DEBUG OPTIONS SECTION     *|
                  |*****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdstr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy stop debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
                  |*****************************************|
                  |*       SOURCE-SPECIFIC MET DATA        *|
                  |*         AND MODEL SECTION             *|
                  |*****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
                  |*****************************************|
                  |*        Source-Specific (IGM)          *|
                  |*     Meteorological Data Section       *|
                  |*****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0   ifldks  Met. field for stability
   6   6   6   6   6   6   2   0   ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0   ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0   ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0   ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
                  |*****************************************|
                  |*          Source-Specific              *|
                  |*  Regulatory Default Model Section     *|
                  |*****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0   Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                            4=COMPLEX-I  5=RTDM  6=SHORTZ
                  |*****************************************|-->This section used if reg
                  |*          Source-Specific              *|   def=0 or to override reg
                  |*     User-Defined Model Section        *|   def w/neg # (-999 = 0)
                  |*****************************************|
Fa-------------------------------------|
                                        :1    User-defined description of
                                        :2    model algorithm sets
                                        :3
                                        :4
                                        :5    These 40-character descriptions
                                        :6    are informational only and may
                                        :7    be left blank
                                        :8
| General technical options |
Fi-|---|---|---|---|---|---|---|
```

```
  0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
  0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
  0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
  0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
  0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
  0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
  0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
  0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
  0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
  0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
  0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
  0   0   0   0   0   0   0   0  ioprfl  Partial reflaction per RTDM yes(1) no(0)
  0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
  0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
  0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
  0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profilas/wd; 1=profiles/rec; 2=hill
  0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profilas/rec
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
  0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
  0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
  0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
  0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
  0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
  0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
  0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
  0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
  0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
  0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
  0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
  0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
  0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
  0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
  0   0   0   0   0   0   0   0  iwsscl  ws scaling from 0=above stack base, 1=above anem base
  0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
  0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
  0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
  0   0   0   0   0   0   0   0  (reserved)
| General technical options (other than integer values) |
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmina
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
    0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
  TAF D  Terrain adjustment factor-Stability D
  TAF E  Terrain adjustment factor-Stability E
  TAF F  Terrain adjustment factor-Stability F
  xmina  Minimum approach (meters)
  xwnu   Cross sector width (n/u)
  xws    Cross sector width (stable)
  alpha  Parameter for BID
  xmnscl Minimum height to scale to
  zvfac  Factor to calc xz (1.169 is exact)
  xmxmin minimum mixing height, meters (0.0=no modification)
  halflf pollutant half-life in seconds (0.0=no pollutant decay)
             |****************************************|
             |*      OPTIONAL P & PTG SECTION        *|
             |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54   3.09   5.14   8.23   10.8   : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00   0.00   0.00   0.00   0.00   0.00    A
   0.00   0.00   0.00   0.00   0.00   0.00    B
   0.00   0.00   0.00   0.00   0.00   0.00    C   :PDEF1
   0.00   0.00   0.00   0.00   0.00   0.00    D    iopp=11
   0.00   0.00   0.00   0.00   0.00   0.00    E
   0.00   0.00   0.00   0.00   0.00   0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00   0.00   0.00   0.00   0.00   0.00    A
   0.00   0.00   0.00   0.00   0.00   0.00    B
   0.00   0.00   0.00   0.00   0.00   0.00    C   :PDEF2
   0.00   0.00   0.00   0.00   0.00   0.00    D    iopp=12
   0.00   0.00   0.00   0.00   0.00   0.00    E
   0.00   0.00   0.00   0.00   0.00   0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00   0.00   0.00   0.00   0.00   0.00    A
   0.00   0.00   0.00   0.00   0.00   0.00    B
   0.00   0.00   0.00   0.00   0.00   0.00    C   :PDEF3
   0.00   0.00   0.00   0.00   0.00   0.00    D    iopp=13
   0.00   0.00   0.00   0.00   0.00   0.00    E
   0.00   0.00   0.00   0.00   0.00   0.00    F
Fr-----|-------|-------|-------|-------|-------|
    .000   .000   .000   .000   .000   .000   A
    .000   .000   .000   .000   .000   .000   B
    .000   .000   .000   .000   .000   .000   C   :DTHDEF1
    .000   .000   .000   .000   .000   .000   D    iopdth=11
    .000   .000   .000   .000   .000   .000   E
    .000   .000   .000   .000   .000   .000   F
Fr-----|-------|-------|-------|-------|-------|
    .000   .000   .000   .000   .000   .000   A
    .000   .000   .000   .000   .000   .000   B
    .000   .000   .000   .000   .000   .000   C   :DTHDEF2
    .000   .000   .000   .000   .000   .000   D    iopdth=12
    .000   .000   .000   .000   .000   .000   E
    .000   .000   .000   .000   .000   .000   F
Fr-----|-------|-------|-------|-------|-------|
    .000   .000   .000   .000   .000   .000   A
    .000   .000   .000   .000   .000   .000   B
    .000   .000   .000   .000   .000   .000   C   :DTHDEF3
    .000   .000   .000   .000   .000   .000   D    iopdth=13
    .000   .000   .000   .000   .000   .000   E
    .000   .000   .000   .000   .000   .000   F
             |****************************************|
             |*      HOURLY SOURCE DATA SECTION      *|
             |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformatted(2)
             |****************************************|
             |*    OZONE LIMITING METHOD SECTION     *|
             |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nssolm  Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nssolm=0
             |****************************************|
             |* HOURLY CHI/SURROGATE SOURCE SECTION  *|
             |****************************************|
Fi-----|
       0  nssorc  Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For oach surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
    0    0  (Surr src name)
            |******************************************|
            |* CONCENTRATION CHECK (CHICHK) SECTION *|
            |******************************************|
Fi-----|
       0   icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|   --> icmode lines
   0   0   jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
Otional Run File - Elamere Landfill
              |****************************************|
              |*     FILE SPECIFICATION SECTION       *|
              |****************************************|
Fa-----------------------------------|
n/a                                   * I OPT Hourly chi (surr src) file
n/a                                   * I OPT Hourly source data input file
elsuhl2.SEQ                           * O OPT Sequential output file
n/a                                   * O OPT Debug Output file
              |****************************************|
              |*  SEQUENTIAL/DEBUG OPTIONS SECTION    *|
              |****************************************|
Fi-----|
      1  iopdsq  Sequential output? n(0) y-concentrations(1) y-detailed(2)
      0  idbug   Debug? 0=no, 1=hour, 2=source, 3=receptor level
      1  jdstr   jdy start debug/sequential output
      1  ihstr   ihr start debug/sequential output
    366  jdstp   jdy stop debug/sequential output
     24  ihstp   ihr stop debug/sequential output
      0  isnsq   Source number for debug/sequential output (0=all sources)
      0  irnsq   (sequential) receptor number for debug/seq output (0=all rec)
      0  iprndx  Printout index calculations y(1) n(0)
              |****************************************|
              |*     SOURCE-SPECIFIC MET DATA         *|
              |*        AND MODEL SECTION             *|
              |****************************************|
Fi-----|
      0  modset  Use algorithm sets and assign at source level y(1) n(0)
      0  iopfm   Optional IGM met data format: 3=ASCII, 4=binary; modset must=1
              |****************************************|
              |*      Source-Specific (IGM)           *|
              |*    Meteorological Data Section       *|
              |****************************************|
Fi-----|
      7  nfield  (IGM format) met data input, number of fields
      0  iuspro  ws/wd profiles in input data y(1) n(0) (iopfm must = 3 or 4)
      0  nlvpro  ws/wd profiles: number of levels
      0  ifspro  ws/wd profiles: field of first profile wind speed
Fr-----|
    0.0  stpro   ws/wd profiles: height of first profile level (m)
    0.0  proinc  ws/wd profiles: profile height increment (m)
Fi-|---|---|---|---|---|---|---|---|
   1   1   1   1   1   1   1   0  ifldks  Met. field for stability
   6   6   6   6   6   6   2   0  ifldws  Met. field for wind speed
   7   7   7   7   7   7   3   0  ifldwd  Met. field for wind direction
   4   4   4   4   4   4   4   0  ifldmx  Met. field for mixing depth
   5   5   5   5   5   5   5   0  ifldtm  Met. field for temperature
Fr-----|-------|-------|-------|-------|-------|-------|-------|
    0.5     0.5     0.5     0.5     0.5     0.5     0.5     0.5  wsclm
   100.    100.    100.    100.    100.    100.     10.     10.  htmets
    wsclm : wind speed threshold (for calm def.)
    htmets: height of wind spd measurement (meters)
              |****************************************|
              |*         Source-Specific              *|
              |*  Regulatory Default Model Section    *|
              |****************************************|
   1   2   3   4   5   6   7   8 -> set number
Fi-|---|---|---|---|---|---|---|---|
   6   5   4   3   2   1   1   0  Reg def: 1=ISCR  2=ISCU(SO2)  3=ISCU(non-SO2)
                                           4=COMPLEX-I  5=RTDM  6=SHORTZ
              |****************************************|-->This section used if reg
              |*         Source-Specific              *|   def=0 or to override reg
              |*    User-Defined Model Section        *|   def w/neg # (-999 = 0)
              |****************************************|
Fa-----------------------------------|
                                     :1    User-defined description of
                                     :2    model algorithm sets
                                     :3
                                     :4
                                     :5    These 40-character descriptions
                                     :6    are informational only and may
                                     :7    be left blank
                                     :8

| General technical options      |
Fi-|---|---|---|---|---|---|---|---|
```

```
    0   0   0   0   0   0   0   0  ignorp  Ignore plume height in intermed. terrain? y(1) n(0)
    0   0   0   0   0   0   0   0  intadd  Add concentrations in int. terrain? y(1) n(0)
    0   0   0   0   0   0   0   0  igrpr   Gradual plume rise: yes(1) no(0)
    0   0   0   0   0   0   0   0  istpd   Stack-tip dwash: 1=y 0=n 2=B/B 3=RTDM 11=ISCST2
    0   0   0   0   0   0   0   0  ibid    BID: 1=yes, 0=no,2=yes, skip if downwash
    0   0   0   0   0   0   0   0  ichop   Chop terrain to stack top? yes(1) no(0)
    0   0   0   0   0   0   0   0  itafnu  1=min approach; 2=sub terrain; 3="wrap"
    0   0   0   0   0   0   0   0  itafs   1=min approach; 2=sub terrain; 3="wrap"
    0   0   0   0   0   0   0   0  ixnu    0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
    0   0   0   0   0   0   0   0  ixs     0=biv. 2=x-sec, COMPLEX-I  3=x-sec, RTDM
    0   0   0   0   0   0   0   0  idfac   Valley "decay" (400=0.0) y(1) n(0)-stable only, stacks
    0   0   0   0   0   0   0   0  iprs    Plume rise 1=ISCST2, 2=SHORTZ, 3=RTDM, 4=COMPLEX-1
    0   0   0   0   0   0   0   0  iopsig  1=PG 2=SZ-U 3=BriggsR 4=BriggsU 5=hourly SA,SE
    0   0   0   0   0   0   0   0  iophc   Calculate Hcrit? yes(1) no(0); yes=itafnu/s not used
    0   0   0   0   0   0   0   0  ioprfl  Partial reflection per RTDM yes(1) no(0)
    0   0   0   0   0   0   0   0  iopszf  Recalc xzv as in ISC2 ? yes(1) no(0)
    0   0   0   0   0   0   0   0  kwake   Use bldg dims for source for downwash? y(1) n(0)
    0   0   0   0   0   0   0   0  iopwkf  Upper(0) or lower(1) bound chi for super-squat (dir-sp)
    0   0   0   0   0   0   0   0  mwhhc   Calc Hcrit from 0=profiles/wd; 1=profiles/rec; 2=hill
    0   0   0   0   0   0   0   0  mwhlm   Calc lim refl from 0=profiles/wd; 1=profiles/rec
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
  | Met selection and usage options |
Fi-|---|---|---|---|---|---|---|
    0   0   0   0   0   0   0   0  iopp    WS Exp; 1=R 2=U 3=RTDM 4=SHORTZ 5=hourly >10:1n=array n
    0   0   0   0   0   0   0   0  ifsp    Field of ws to use with iopp=4or>10; 0=Plume Rise ws
    0   0   0   0   0   0   0   0  ifhp    Field for hourly p (iopp=5)
    0   0   0   0   0   0   0   0  iopdth  Vert. PTG: 1=.02,.035 2=SHORTZ 3=hourly, >10:1n=array n
    0   0   0   0   0   0   0   0  ifsd    Field of ws to use with iopdth=4or>10; 0=Plume Rise ws
    0   0   0   0   0   0   0   0  ifhd    Field for hourly dth (iopdth=3)
    0   0   0   0   0   0   0   0  iopmhu  Mix ht use: 0=0.0 all stab; 1=unl stbl 2=RTDM; 3=CMPLX1
    0   0   0   0   0   0   0   0  iopmhc  Mix height compare: 0=above stack base, 1=const elev
    0   0   0   0   0   0   0   0  iwchmx  Which mix? 1=Rural, 2=Urban (applies only if iopfm <=2)
    0   0   0   0   0   0   0   0  ismths  Smooth stability? y(1)n(0),if iopfm=-2,2,3or 4 def to 0
    0   0   0   0   0   0   0   0  iprpws  Met profile ws 1=scaled from stk top; 2=plume level
    0   0   0   0   0   0   0   0  iprpwd  Met profile wd 1=stk top; 2=plume level
    0   0   0   0   0   0   0   0  limp    Limit ws to RTDM-defined heights? y(1) n(0)
    0   0   0   0   0   0   0   0  iwsdil  Dilution ws? 1=stack, 2=plume ht
    0   0   0   0   0   0   0   0  iwschk  Set ws=1.0 min; 0=no; 1=aft scl only, 2=input & aft scl
    0   0   0   0   0   0   0   0  iwsacl  ws scaling from 0=above stack base, 1=above anem base
    0   0   0   0   0   0   0   0  ioucat  Ucats speed use-input(1) or source ht(0)
    0   0   0   0   0   0   0   0  ifhrsa  Field for hourly horiz turb intensity
    0   0   0   0   0   0   0   0  ifhrse  Field for hourly vert turb intensity
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
    0   0   0   0   0   0   0   0  (reserved)
  | General technical options (other than integer values) |
Fr------|-------|-------|-------|-------|-------|-------|-------|
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF A
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF B
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF C
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF D
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF E
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  TAF F
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmina
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xwnu
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xws
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  alpha
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmnscl
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  zvfac
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  xmxmin
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  halflf
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
      0.0     0.0     0.0     0.0     0.0     0.0     0.0     0.0  (resv)
Technical Options Descriptions:
  TAF A  Terrain adjustment factor-Stability A
  TAF B  Terrain adjustment factor-Stability B
  TAF C  Terrain adjustment factor-Stability C
```

```
TAF D  Terrain adjustment factor-Stability D
TAF E  Terrain adjustment factor-Stability E
TAF F  Terrain adjustment factor-Stability F
xmina  Minimum approach (meters)
xwnu   Cross sector width (n/u)
xws    Cross sector width (stable)
alpha  Parameter for BID
xmnscl Minimum height to scale to
zvfac  Factor to calc xz (1.169 is exact)
xmxmin minimum mixing height, meters (0.0=no modification)
halflf pollutant half-life in seconds (0.0=no pollutant decay)
            |****************************************|
            |*      OPTIONAL P & PTG SECTION        *|
            |****************************************|
| Values in this section are accessed through iopp and iopdth |
Fr-----|-------|-------|-------|-------|
   1.54    3.09    5.14    8.23    10.8    : UCATM (Five wind speed values)
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF1
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=11
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF2
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=12
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   0.00    0.00    0.00    0.00    0.00    0.00    A
   0.00    0.00    0.00    0.00    0.00    0.00    B
   0.00    0.00    0.00    0.00    0.00    0.00    C    :PDEF3
   0.00    0.00    0.00    0.00    0.00    0.00    D     iopp=13
   0.00    0.00    0.00    0.00    0.00    0.00    E
   0.00    0.00    0.00    0.00    0.00    0.00    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF1
   .000    .000    .000    .000    .000    .000    D     iopdth=11
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF2
   .000    .000    .000    .000    .000    .000    D     iopdth=12
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
Fr-----|-------|-------|-------|-------|-------|
   .000    .000    .000    .000    .000    .000    A
   .000    .000    .000    .000    .000    .000    B
   .000    .000    .000    .000    .000    .000    C    :DTHDEF3
   .000    .000    .000    .000    .000    .000    D     iopdth=13
   .000    .000    .000    .000    .000    .000    E
   .000    .000    .000    .000    .000    .000    F
            |****************************************|
            |*      HOURLY SOURCE DATA SECTION      *|
            |****************************************|
Fi-----|
       0  ihsdat  Use hourly source data? n(0); y(1); y, Q only(2)
       0  nshsd   If ihsdat >= 1, number of sources
       0  ifmhsd  Format of hrly source data file ASCII(1) or unformattsd(2)
            |****************************************|
            |*    OZONE LIMITING METHOD SECTION     *|
            |****************************************|
Fi-----|
       0  iopolm  Use "Ozone Limiting" method n(0) y(1) as defined in IGM Users Guide
       0  nsolm   Number of surr source to use for OLM (chi by hour)
     0.0  olmval  Fixed chi value for OLM, only if nsolm=0
            |****************************************|
            |* HOURLY CHI/SURROGATE SOURCE SECTION  *|
            |****************************************|
Fi-----|
       0  nsorc   Number of surrogate sources in hourly chi file
       0  ifmsrs  Format of hrly surrogate srce data file ASCII(1) or unformt(2)
       0  ihcsrc  Surrogate sources: one chi (1) or by receptor (2) for each hr
```

```
 For each surrogate source:
 num  grp    source name   --> grp can be 0 if ngroup=0 in source file
Vi--|i---|a------------------| --> nssorc lines
    0    0  (Surr src name)
             |*****************************************|
             |* CONCENTRATION CHECK (CHICHK) SECTION *|
             |*****************************************|
Fi-----|
       0  icmode CHICHK mode? n(0) y(1 or greater=no. of day/receptor combinations)
Vi-|---|  --> icmode lines
   0   0  jdy, rec. no: julian day & receptor no. combination to create CHICHK for
```

```
IGM v. 92120 Source file converted from ISC2 input file
                |***************************************|
                |*          FILE SIZING SECTION        *|
                |***************************************|
Fi-----|
      0  ngroup  Number of source groups (0=each source is a group)
      0  ngtots  Number of totals (0=one total over all groups)
      0  npsorc  Number of point sources
      3  nvsorc  Number of volume sources
      0  nesorc  Number of area sources
      0  nsdsbd  Number of sets of direction-specific building dimensions
      0  nqf1    Number of "Qflag-1" arrays (vary seasonally)
      0  nqf2    Number of "Qflag-2" arrays (vary by month)
      0  nqf3    Number of "Qflag-3" arrays (vary by hour of day)
      0  nqf4    Number of "Qflag-4" arrays (vary by stability & wind speed)
      0  nqf5    Number of "Qflag-5" arrays (vary by season and hour of day)
                |***************************************|
                |*          GROUP TOTALS SECTION       *|
                |*            (ngtots lines)           *|
                |***************************************|
|                                    num-  Group i.d. that define total      |
|         Total Name(s)              num   (max. 99-enter numnum/10 lines)   |
Va-----------------------------------|||i--|---|---|---|---|---|---|---|---|---|

                |***************************************|
                |*       SOURCE GROUPING SECTION       *|
                |*           (ngroup lines)            *|
                |***************************************|
|                                   Group  Short  -(Group # assigned to
|         Group Name(s)              i.d. Name(s)   sh name if blank)
Va-----------------------------------|i-|a------|

                |***************************************|
                |*          POINT SOURCE SECTION       *|
                |*           (npsorc lines)            *|
                |***************************************|
|     G      B                                                                            |
|     R M M P L Q W                      Q      XS      YS      ZS     Hs     Ts    Vs     D     HB     PW |
|SNUM P P I R D F Q   Source Name     g/sec    (m)     (m)    (ft)    (m)    (K)  (m/s)  (m)   (m)    (m)|
Vi--|--|-|-|-|-|-|-|a-----------------|r------|------|------|-----|-----|-----|-----|-----|-----|-----|
                |***************************************|
                |*         VOLUME SOURCE SECTION       *|
                |*            (nvsorc lines)           *|
                |***************************************|
|       Q W                           Q     Xctr    Yctr    ZS   Hctr  SGZO  SGYO|
|SNUM  G MF Q     Source Name     (g/sec)   (m)     (m)   (ft)  (m)    (m)   (m)|
Vi--|--|-||-|a-----------------|r------|------|------|-----|-----|-----|-----|
20001  2 00 0 VOLUME SRC 90        1.0000363815.3801037 2620.   1.5 1.39537.814
20002  2 00 0 VOLUME SRC 91        1.0000363846.3801097 2635.   1.5 1.39537.814
20003  2 00 0 VOLUME SRC 92        1.0000363875.3801166 2637.   1.5 1.39537.814
                |***************************************|
                |*          AREA SOURCE SECTION        *|
                |*            (nesorc lines)           *|
                |***************************************|
|       Q W                           Q      XSw     YSw     ZS   Heff  Width|
|SNUM  G MF Q     Source Name     (g/s/m2)  (m)     (m)   (ft)  (m)    (m) |
Vi--|--|-||-|a-----------------|r------|------|------|-----|-----|-----|
|                                                                              |
|**** DIRECTION-SPECIFIC BLDG DIMENSION INPUTS (NSDSBD/5 BLOCKS-36 lines) ****.Upper|
|**** NOTE THAT A VALUE OF -1.0 REPEATS THE VALUE FROM THE LAST FLOW VECTOR **.  /  |
|****  ALSO NOTE THAT WAKE FLAGS ARE USED ONLY IF TECH OPTION IWKFLG IS = 1 **.Lower|
|                                                                            .Bound|
| N=  0   SET N+1        SET N+2        SET N+3        SET N+4        SET N+5 . Wake|
|         BH     BPW     BH     BPW     BH     BPW     BH     BPW     BH    BPW.Flags|
| FV                                                                         .12345|
Bi-|r------|------|-------|------|-------|------|-------|------|-------|------||||||
  10     0.0    0.0     0.0    0.0     0.0    0.0     0.0    0.0     0.0   0.00
  20    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0  -1.00
  30    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0   -1.0    -1.0  -1.00
```

```
 40   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 50   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 60   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 70   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 80   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
 90   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
100   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
110   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
120   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
130   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
140   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
150   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
160   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
170   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
180   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
190   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
200   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
210   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
220   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
230   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
240   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
250   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
260   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
270   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
280   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
290   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
300   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
310   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
320   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
330   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
340   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
350   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
360   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.0   -1.0  -1.00
            |***************************************|
            |*       EMISSION SCALAR SECTION       *|
            |***************************************|
|
|QFLAG = 1 (Seasonal variation) - 1 line per nqf1|
Vr---|-----|-----|-----|
   1.0   1.0   1.0   1.0  1
|
|QFLAG = 2 (Monthly variation) - 1 line per nqf2|
Vr---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1
|
|QFLAG = 3 (Hour of Day variation) - 2 lines per nqf3|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1  1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 13-24
|
|QFLAG = 4 (Stability and wind speed variation)|
Fr---|-----|-----|-----|-----|
  0.00
|
|QFLAG = 5 (Season (S1-S4) and hour of day variation) - 8 lines per nqf5|
Br---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 1 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 2 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 3 13-24
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 1-12
   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0   1.0  1 4 13-24
```

ESWMF IGM MODEL INPUT

RECEPTOR FILES

```
 Receptor File
Fi-----|
       0 iuzfl   Use ZFLAG (flagpole receptor heights) ? 1=yes, 0=no
       1 nrgrds  Number of receptor grids (max. 99)
|                                                                    |
|G M          Grid Name (60 characters) - nrgrds lines               |
V|i|  a--------------------------------------------------------------|
 1 1  Receptors from ISCST2 input file
|                                                              |
|     X          Y           Z      ZFLAG      Hill    Receptor|
|GM (meters)  (meters)      (ft)    (ft)       (ft)    Name-8ch|
V||r--------|---------|---------|---------|---------|a------|
 11  408768.0 3798442.0    4900.0       0.0       0.0 Class 1
 11  360000.0 3797000.0    1800.0       0.0       0.0 R#     1
 11  360500.0 3797000.0    1550.0       0.0       0.0 R#     2
 11  361000.0 3797000.0    1350.0       0.0       0.0 R#     3
 11  361500.0 3797000.0    1300.0       0.0       0.0 R#     4
 11  362000.0 3797000.0    1240.0       0.0       0.0 R#     5
 11  362500.0 3797000.0    1240.0       0.0       0.0 R#     6
 11  363000.0 3797000.0    1200.0       0.0       0.0 R#     7
 11  363500.0 3797000.0    1240.0       0.0       0.0 R#     8
 11  364000.0 3797000.0    1240.0       0.0       0.0 R#     9
 11  364500.0 3797000.0    1220.0       0.0       0.0 R#    10
 11  365000.0 3797000.0    1240.0       0.0       0.0 R#    11
 11  365500.0 3797000.0    1240.0       0.0       0.0 R#    12
 11  366000.0 3797000.0    1240.0       0.0       0.0 R#    13
 11  366500.0 3797000.0    1240.0       0.0       0.0 R#    14
 11  367000.0 3797000.0    1240.0       0.0       0.0 R#    15
 11  360000.0 3797500.0    2025.0       0.0       0.0 R#    16
 11  360500.0 3797500.0    1525.0       0.0       0.0 R#    17
 11  361000.0 3797500.0    1475.0       0.0       0.0 R#    18
 11  361500.0 3797500.0    1400.0       0.0       0.0 R#    19
 11  362000.0 3797500.0    1320.0       0.0       0.0 R#    20
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 11  361000.0 3798000.0    1400.0       0.0       0.0 R#    33
 11  361500.0 3798000.0    1475.0       0.0       0.0 R#    34
 11  362000.0 3798000.0    1520.0       0.0       0.0 R#    35
 11  362500.0 3798000.0    1280.0       0.0       0.0 R#    36
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 11  363500.0 3798000.0    1280.0       0.0       0.0 R#    38
 11  364000.0 3798000.0    1280.0       0.0       0.0 R#    39
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 11  366000.0 3798000.0    1320.0       0.0       0.0 R#    43
 11  366500.0 3798000.0    1320.0       0.0       0.0 R#    44
 11  367000.0 3798000.0    1360.0       0.0       0.0 R#    45
 11  360000.0 3798500.0    1800.0       0.0       0.0 R#    46
 11  360500.0 3798500.0    2000.0       0.0       0.0 R#    47
 11  361000.0 3798500.0    1850.0       0.0       0.0 R#    48
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 11  362500.0 3798500.0    1320.0       0.0       0.0 R#    51
 11  363000.0 3798500.0    1400.0       0.0       0.0 R#    52
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 11  365000.0 3798500.0    1360.0       0.0       0.0 R#    56
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11	360000.0	3799000.0	1750.0	0.0	0.0	R#	61
11	360500.0	3799000.0	1625.0	0.0	0.0	R#	62
11	361000.0	3799000.0	1550.0	0.0	0.0	R#	63
11	361500.0	3799000.0	1500.0	0.0	0.0	R#	64
11	362000.0	3799000.0	1440.0	0.0	0.0	R#	65
11	362500.0	3799000.0	1400.0	0.0	0.0	R#	66
11	363000.0	3799000.0	1400.0	0.0	0.0	R#	67
11	363500.0	3799000.0	1480.0	0.0	0.0	R#	68
11	364000.0	3799000.0	1440.0	0.0	0.0	R#	69
11	364500.0	3799000.0	1480.0	0.0	0.0	R#	70
11	365000.0	3799000.0	1440.0	0.0	0.0	R#	71
11	365500.0	3799000.0	1440.0	0.0	0.0	R#	72
11	366000.0	3799000.0	1480.0	0.0	0.0	R#	73
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11	367000.0	3799000.0	1440.0	0.0	0.0	R#	75
11	360000.0	3799500.0	1800.0	0.0	0.0	R#	76
11	360500.0	3799500.0	1675.0	0.0	0.0	R#	77
11	361000.0	3799500.0	1500.0	0.0	0.0	R#	78
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11	362000.0	3799500.0	1400.0	0.0	0.0	R#	80
11	362500.0	3799500.0	1360.0	0.0	0.0	R#	81
11	363000.0	3799500.0	1520.0	0.0	0.0	R#	82
11	363500.0	3799500.0	1520.0	0.0	0.0	R#	83
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11	365000.0	3799500.0	1600.0	0.0	0.0	R#	86
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11	360500.0	3800000.0	1850.0	0.0	0.0	R#	92
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11	361500.0	3800000.0	1425.0	0.0	0.0	R#	94
11	362000.0	3800000.0	1800.0	0.0	0.0	R#	95
11	362500.0	3800000.0	1680.0	0.0	0.0	R#	96
11	363000.0	3800000.0	1760.0	0.0	0.0	R#	97
11	363500.0	3800000.0	2360.0	0.0	0.0	R#	98
11	364500.0	3800000.0	2200.0	0.0	0.0	R#	99
11	365000.0	3800000.0	1640.0	0.0	0.0	R#	100
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11	366000.0	3800000.0	2000.0	0.0	0.0	R#	102
11	366500.0	3800000.0	1800.0	0.0	0.0	R#	103
11	367000.0	3800000.0	1600.0	0.0	0.0	R#	104
11	360000.0	3800500.0	2075.0	0.0	0.0	R#	105
11	360500.0	3800500.0	1750.0	0.0	0.0	R#	106
11	361000.0	3800500.0	1700.0	0.0	0.0	R#	107
11	361500.0	3800500.0	1675.0	0.0	0.0	R#	108
11	363000.0	3800500.0	2000.0	0.0	0.0	R#	109
11	365500.0	3800500.0	2120.0	0.0	0.0	R#	110
11	366000.0	3800500.0	2400.0	0.0	0.0	R#	111
11	366500.0	3800500.0	2040.0	0.0	0.0	R#	112
11	367000.0	3800500.0	1880.0	0.0	0.0	R#	113
11	360000.0	3801000.0	1925.0	0.0	0.0	R#	114
11	360500.0	3801000.0	2075.0	0.0	0.0	R#	115
11	361000.0	3801000.0	1725.0	0.0	0.0	R#	116
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11	365500.0	3801000.0	2520.0	0.0	0.0	R#	118
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11	360000.0	3801500.0	2000.0	0.0	0.0	R#	122
11	360500.0	3801500.0	1775.0	0.0	0.0	R#	123
11	361000.0	3801500.0	1950.0	0.0	0.0	R#	124
11	361500.0	3801500.0	1700.0	0.0	0.0	R#	125

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11	366000.0	3801500.0	3240.0	0.0	0.0	R#	127
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11	360500.0	3802000.0	1550.0	0.0	0.0	R#	131
11	361000.0	3802000.0	1775.0	0.0	0.0	R#	132
11	361500.0	3802000.0	1600.0	0.0	0.0	R#	133
11	365500.0	3802000.0	3160.0	0.0	0.0	R#	134
11	366000.0	3802000.0	3480.0	0.0	0.0	R#	135
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11	360000.0	3802500.0	1475.0	0.0	0.0	R#	138
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11	360500.0	3803000.0	1325.0	0.0	0.0	R#	147
11	361000.0	3803000.0	1325.0	0.0	0.0	R#	148
11	361500.0	3803000.0	1250.0	0.0	0.0	R#	149
11	363500.0	3803000.0	1920.0	0.0	0.0	R#	150
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11	363500.0	3804500.0	1520.0	0.0	0.0	R#	188
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11	365000.0	3804500.0	1800.0	0.0	0.0	R#	190
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11	367000.0	3804500.0	1920.0	0.0	0.0	R#	194

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11	363000.0	3805000.0	1440.0	0.0	0.0	R#	201
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11	364500.0	3805500.0	1560.0	0.0	0.0	R#	219
11	365000.0	3805500.0	1760.0	0.0	0.0	R#	220
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11	363500.0	3806000.0	1840.0	0.0	0.0	R#	232
11	364000.0	3806000.0	1920.0	0.0	0.0	R#	233
11	364500.0	3806000.0	1680.0	0.0	0.0	R#	234
11	365000.0	3806000.0	1800.0	0.0	0.0	R#	235
11	365500.0	3806000.0	2080.0	0.0	0.0	R#	236
11	366000.0	3806000.0	1800.0	0.0	0.0	R#	237
11	366500.0	3806000.0	1800.0	0.0	0.0	R#	238
11	367000.0	3806000.0	1720.0	0.0	0.0	R#	239
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11	367000.0	3806500.0	1640.0	0.0	0.0	R#	254
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11	363500.0	3807000.0	1720.0	0.0	0.0	R#	262
11	364000.0	3807000.0	1720.0	0.0	0.0	R#	263

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11	366000.0	3807000.0	1880.0	0.0	0.0	R#	267
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11	367000.0	3807000.0	1560.0	0.0	0.0	R#	269
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11	360500.0	3807500.0	1350.0	0.0	0.0	R#	271
11	361000.0	3807500.0	1425.0	0.0	0.0	R#	272
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11	362000.0	3807500.0	1500.0	0.0	0.0	R#	274
11	362500.0	3807500.0	1760.0	0.0	0.0	R#	275
11	363000.0	3807500.0	1800.0	0.0	0.0	R#	276
11	363500.0	3807500.0	1560.0	0.0	0.0	R#	277
11	364000.0	3807500.0	1520.0	0.0	0.0	R#	278
11	364500.0	3807500.0	1480.0	0.0	0.0	R#	279
11	365000.0	3807500.0	1480.0	0.0	0.0	R#	280
11	365500.0	3807500.0	1520.0	0.0	0.0	R#	281
11	366000.0	3807500.0	1600.0	0.0	0.0	R#	282
11	366500.0	3807500.0	1520.0	0.0	0.0	R#	283
11	367000.0	3807500.0	1560.0	0.0	0.0	R#	284
11	361805.0	3803268.0	1450.0	0.0	0.0	BR#	285
11	361902.0	3803268.0	1475.0	0.0	0.0	BR#	286
11	362000.0	3803268.0	1450.0	0.0	0.0	BR#	287
11	362110.0	3803256.0	1480.0	0.0	0.0	BR#	288
11	362207.0	3803244.0	1520.0	0.0	0.0	BR#	289
11	362293.0	3803232.0	1560.0	0.0	0.0	BR#	290
11	362365.0	3803220.0	1560.0	0.0	0.0	BR#	291
11	362365.0	3803098.0	1560.0	0.0	0.0	BR#	292
11	362488.0	3803098.0	1640.0	0.0	0.0	BR#	293
11	362585.0	3803098.0	1680.0	0.0	0.0	BR#	294
11	362683.0	3803098.0	1760.0	0.0	0.0	BR#	295
11	362781.0	3803098.0	1840.0	0.0	0.0	BR#	296
11	362878.0	3803098.0	1840.0	0.0	0.0	BR#	297
11	362976.0	3803098.0	1760.0	0.0	0.0	BR#	298
11	363049.0	3803098.0	1680.0	0.0	0.0	BR#	299
11	363146.0	3803098.0	1760.0	0.0	0.0	BR#	300
11	363146.0	3803000.0	1840.0	0.0	0.0	BR#	301
11	363146.0	3802890.0	1960.0	0.0	0.0	BR#	302
11	363146.0	3802804.0	1960.0	0.0	0.0	BR#	303
11	363268.0	3802793.0	1960.0	0.0	0.0	BR#	304
11	363366.0	3802780.0	2000.0	0.0	0.0	BR#	305
11	363476.0	3802774.0	2040.0	0.0	0.0	BR#	306
11	363585.0	3802768.0	2000.0	0.0	0.0	BR#	307
11	363671.0	3802762.0	1960.0	0.0	0.0	BR#	308
11	363780.0	3802756.0	1960.0	0.0	0.0	BR#	309
11	363878.0	3802750.0	2040.0	0.0	0.0	BR#	310
11	363963.0	3802750.0	2040.0	0.0	0.0	BR#	311
11	364049.0	3802744.0	2080.0	0.0	0.0	BR#	312
11	364146.0	3802740.0	2120.0	0.0	0.0	BR#	313
11	364244.0	3802736.0	2160.0	0.0	0.0	BR#	314
11	364341.0	3802732.0	2240.0	0.0	0.0	BR#	315
11	364341.0	3802829.0	2280.0	0.0	0.0	BR#	316
11	364341.0	3802939.0	2240.0	0.0	0.0	BR#	317
11	364341.0	3803024.0	2240.0	0.0	0.0	BR#	318
11	364341.0	3803122.0	2320.0	0.0	0.0	BR#	319
11	364341.0	3803220.0	2200.0	0.0	0.0	BR#	320
11	364341.0	3803323.0	2120.0	0.0	0.0	BR#	321
11	364341.0	3803415.0	2040.0	0.0	0.0	BR#	322
11	364341.0	3803513.0	2040.0	0.0	0.0	BR#	323
11	364341.0	3803573.0	1960.0	0.0	0.0	BR#	324
11	364256.0	3803576.0	1840.0	0.0	0.0	BR#	325
11	364170.0	3803580.0	1880.0	0.0	0.0	BR#	326
11	364073.0	3803584.0	1880.0	0.0	0.0	BR#	327
11	363976.0	3803588.0	1800.0	0.0	0.0	BR#	328
11	363878.0	3803592.0	1800.0	0.0	0.0	BR#	329
11	363780.0	3803596.0	1720.0	0.0	0.0	BR#	330
11	363683.0	3803600.0	1640.0	0.0	0.0	BR#	331
11	363585.0	3803605.0	1560.0	0.0	0.0	BR#	332

11	363524.0	3803610.0	1560.0	0.0	0.0	BR# 333
11	363530.0	3803707.0	1680.0	0.0	0.0	BR# 334
11	363534.0	3803817.0	1600.0	0.0	0.0	BR# 335
11	363538.0	3803909.0	1640.0	0.0	0.0	BR# 336
11	363542.0	3804000.0	1760.0	0.0	0.0	BR# 337
11	363546.0	3804098.0	1720.0	0.0	0.0	BR# 338
11	363550.0	3804195.0	1680.0	0.0	0.0	BR# 339
11	363554.0	3804293.0	1720.0	0.0	0.0	BR# 340
11	363558.0	3804390.0	1640.0	0.0	0.0	BR# 341
11	363561.0	3804463.0	1560.0	0.0	0.0	BR# 342
11	363683.0	3804459.0	1600.0	0.0	0.0	BR# 343
11	363781.0	3804454.0	1560.0	0.0	0.0	BR# 344
11	363878.0	3804449.0	1560.0	0.0	0.0	BR# 345
11	363976.0	3804444.0	1600.0	0.0	0.0	BR# 346
11	363976.0	3804366.0	1600.0	0.0	0.0	BR# 347
11	364067.0	3804360.0	1560.0	0.0	0.0	BR# 348
11	364171.0	3804353.0	1560.0	0.0	0.0	BR# 349
11	364268.0	3804347.0	1600.0	0.0	0.0	BR# 350
11	364375.0	3804341.0	1680.0	0.0	0.0	BR# 351
11	364375.0	3804439.0	1640.0	0.0	0.0	BR# 352
11	364375.0	3804530.0	1560.0	0.0	0.0	BR# 353
11	364375.0	3804636.0	1500.0	0.0	0.0	BR# 354
11	364485.0	3804636.0	1520.0	0.0	0.0	BR# 355
11	364576.0	3804636.0	1520.0	0.0	0.0	BR# 356
11	364673.0	3804636.0	1560.0	0.0	0.0	BR# 357
11	364742.0	3804636.0	1600.0	0.0	0.0	BR# 358
11	364818.0	3804636.0	1640.0	0.0	0.0	BR# 359
11	364818.0	3804561.0	1680.0	0.0	0.0	BR# 360
11	364818.0	3804409.0	1880.0	0.0	0.0	BR# 361
11	364909.0	3804409.0	1920.0	0.0	0.0	BR# 362
11	365015.0	3804409.0	1880.0	0.0	0.0	BR# 363
11	365120.0	3804409.0	1880.0	0.0	0.0	BR# 364
11	365222.0	3804409.0	1800.0	0.0	0.0	BR# 365
11	365225.0	3804293.0	1880.0	0.0	0.0	BR# 366
11	365227.0	3804195.0	2000.0	0.0	0.0	BR# 367
11	365230.0	3804110.0	2120.0	0.0	0.0	BR# 368
11	365232.0	3804012.0	2240.0	0.0	0.0	BR# 369
11	365235.0	3803915.0	2280.0	0.0	0.0	BR# 370
11	365237.0	3803823.0	2180.0	0.0	0.0	BR# 371
11	365240.0	3803726.0	2180.0	0.0	0.0	BR# 372
11	365242.0	3803634.0	2120.0	0.0	0.0	BR# 373
11	365244.0	3803537.0	2200.0	0.0	0.0	BR# 374
11	365244.0	3803433.0	2280.0	0.0	0.0	BR# 375
11	365244.0	3803341.0	2320.0	0.0	0.0	BR# 376
11	365240.0	3803244.0	2360.0	0.0	0.0	BR# 377
11	365235.0	3803146.0	2480.0	0.0	0.0	BR# 378
11	365230.0	3803049.0	2640.0	0.0	0.0	BR# 379
11	365225.0	3802976.0	2720.0	0.0	0.0	BR# 380
11	365220.0	3802878.0	2800.0	0.0	0.0	BR# 381
11	365215.0	3802780.0	2800.0	0.0	0.0	BR# 382
11	365210.0	3802677.0	2840.0	0.0	0.0	BR# 383
11	365205.0	3802585.0	2840.0	0.0	0.0	BR# 384
11	365200.0	3802488.0	3020.0	0.0	0.0	BR# 385
11	365195.0	3802390.0	3080.0	0.0	0.0	BR# 386
11	365192.0	3802293.0	3120.0	0.0	0.0	BR# 387
11	365188.0	3802195.0	3200.0	0.0	0.0	BR# 388
11	365185.0	3802098.0	3100.0	0.0	0.0	BR# 389
11	365182.0	3802000.0	3000.0	0.0	0.0	BR# 390
11	365178.0	3801915.0	2920.0	0.0	0.0	BR# 391
11	365175.0	3801817.0	2900.0	0.0	0.0	BR# 392
11	365172.0	3801732.0	2760.0	0.0	0.0	BR# 393
11	365168.0	3801622.0	2560.0	0.0	0.0	BR# 394
11	365165.0	3801530.0	2560.0	0.0	0.0	BR# 395
11	365162.0	3801427.0	2680.0	0.0	0.0	BR# 396
11	365158.0	3801329.0	2640.0	0.0	0.0	BR# 397
11	365155.0	3801238.0	2440.0	0.0	0.0	BR# 398
11	365152.0	3801140.0	2520.0	0.0	0.0	BR# 399
11	365148.0	3801037.0	2400.0	0.0	0.0	BR# 400
11	365145.0	3800951.0	2360.0	0.0	0.0	BR# 401

11	365142.0	3800854.0	2160.0	0.0	0.0	BR# 402
11	365138.0	3800762.0	2140.0	0.0	0.0	BR# 403
11	365135.0	3800659.0	2300.0	0.0	0.0	BR# 404
11	365132.0	3800561.0	2400.0	0.0	0.0	BR# 405
11	365128.0	3800463.0	2280.0	0.0	0.0	BR# 406
11	365125.0	3800365.0	2240.0	0.0	0.0	BR# 407
11	365122.0	3800256.0	2120.0	0.0	0.0	BR# 408
11	365029.0	3800260.0	1920.0	0.0	0.0	BR# 409
11	364933.0	3800264.0	2000.0	0.0	0.0	BR# 410
11	364841.0	3800268.0	2240.0	0.0	0.0	BR# 411
11	364750.0	3800272.0	2200.0	0.0	0.0	BR# 412
11	364652.0	3800276.0	2040.0	0.0	0.0	BR# 413
11	364543.0	3800280.0	2280.0	0.0	0.0	BR# 414
11	364457.0	3800284.0	2400.0	0.0	0.0	BR# 415
11	364354.0	3800289.0	2520.0	0.0	0.0	BR# 416
11	364317.0	3800293.0	2600.0	0.0	0.0	BR# 417
11	364317.0	3800195.0	2560.0	0.0	0.0	BR# 418
11	364317.0	3800098.0	2360.0	0.0	0.0	BR# 419
11	364317.0	3800000.0	2200.0	0.0	0.0	BR# 420
11	364317.0	3799915.0	2180.0	0.0	0.0	BR# 421
11	364220.0	3799915.0	2240.0	0.0	0.0	BR# 422
11	364122.0	3799915.0	1960.0	0.0	0.0	BR# 423
11	364024.0	3799915.0	2080.0	0.0	0.0	BR# 424
11	363905.0	3799915.0	1960.0	0.0	0.0	BR# 425
11	363910.0	3799829.0	2080.0	0.0	0.0	BR# 426
11	363916.0	3799732.0	1880.0	0.0	0.0	BR# 427
11	363921.0	3799634.0	1680.0	0.0	0.0	BR# 428
11	363927.0	3799512.0	1600.0	0.0	0.0	BR# 429
11	363829.0	3799518.0	1600.0	0.0	0.0	BR# 430
11	363730.0	3799524.0	1600.0	0.0	0.0	BR# 431
11	363625.0	3799530.0	1600.0	0.0	0.0	BR# 432
11	363512.0	3799536.0	1640.0	0.0	0.0	BR# 433
11	363506.0	3799652.0	1680.0	0.0	0.0	BR# 434
11	363499.0	3799744.0	1920.0	0.0	0.0	BR# 435
11	363493.0	3799841.0	2000.0	0.0	0.0	BR# 436
11	363487.0	3799939.0	2200.0	0.0	0.0	BR# 437
11	363481.0	3800024.0	2440.0	0.0	0.0	BR# 438
11	363475.0	3800129.0	2400.0	0.0	0.0	BR# 439
11	363469.0	3800235.0	2400.0	0.0	0.0	BR# 440
11	363463.0	3800341.0	2480.0	0.0	0.0	BR# 441
11	363378.0	3800347.0	2400.0	0.0	0.0	BR# 442
11	363270.0	3800354.0	2220.0	0.0	0.0	BR# 443
11	363183.0	3800360.0	2240.0	0.0	0.0	BR# 444
11	363098.0	3800366.0	2200.0	0.0	0.0	BR# 445
11	363101.0	3800463.0	2160.0	0.0	0.0	BR# 446
11	363104.0	3800561.0	2160.0	0.0	0.0	BR# 447
11	363107.0	3800659.0	2200.0	0.0	0.0	BR# 448
11	363110.0	3800732.0	2280.0	0.0	0.0	BR# 449
11	363012.0	3800738.0	2240.0	0.0	0.0	BR# 450
11	362927.0	3800744.0	2280.0	0.0	0.0	BR# 451
11	362835.0	3800750.0	2240.0	0.0	0.0	BR# 452
11	362732.0	3800756.0	2200.0	0.0	0.0	BR# 453
11	362726.0	3800659.0	2120.0	0.0	0.0	BR# 454
11	362720.0	3800561.0	1960.0	0.0	0.0	BR# 455
11	362713.0	3800463.0	1920.0	0.0	0.0	BR# 456
11	362707.0	3800378.0	1920.0	0.0	0.0	BR# 457
11	362610.0	3800379.0	1960.0	0.0	0.0	BR# 458
11	362512.0	3800381.0	1820.0	0.0	0.0	BR# 459
11	362415.0	3800382.0	1800.0	0.0	0.0	BR# 460
11	362312.0	3800384.0	1880.0	0.0	0.0	BR# 461
11	362208.0	3800385.0	1840.0	0.0	0.0	BR# 462
11	362104.0	3800387.0	1720.0	0.0	0.0	BR# 463
11	362000.0	3800388.0	1675.0	0.0	0.0	BR# 464
11	361902.0	3800390.0	1725.0	0.0	0.0	BR# 465
11	361914.0	3800488.0	1700.0	0.0	0.0	BR# 466
11	361927.0	3800585.0	1750.0	0.0	0.0	BR# 467
11	361939.0	3800661.0	1650.0	0.0	0.0	BR# 468
11	361951.0	3800732.0	1750.0	0.0	0.0	BR# 469
11	361854.0	3800732.0	1650.0	0.0	0.0	BR# 470

11	361756.0	3800732.0	1700.0	0.0	0.0	BR# 471
11	361659.0	3800732.0	1650.0	0.0	0.0	BR# 472
11	361610.0	3800732.0	1675.0	0.0	0.0	BR# 473
11	361634.0	3800860.0	1675.0	0.0	0.0	BR# 474
11	361664.0	3800957.0	1750.0	0.0	0.0	BR# 475
11	361695.0	3801037.0	1875.0	0.0	0.0	BR# 476
11	361732.0	3801139.0	1850.0	0.0	0.0	BR# 477
11	361756.0	3801232.0	1750.0	0.0	0.0	BR# 478
11	361774.0	3801299.0	1700.0	0.0	0.0	BR# 479
11	361829.0	3801244.0	1775.0	0.0	0.0	BR# 480
11	361878.0	3801183.0	1850.0	0.0	0.0	BR# 481
11	361927.0	3801140.0	1900.0	0.0	0.0	BR# 482
11	361970.0	3801073.0	1975.0	0.0	0.0	BR# 483
11	361970.0	3801183.0	1925.0	0.0	0.0	BR# 484
11	361927.0	3801232.0	1925.0	0.0	0.0	BR# 485
11	361890.0	3801280.0	1850.0	0.0	0.0	BR# 486
11	361841.0	3801335.0	1825.0	0.0	0.0	BR# 487
11	361780.0	3801402.0	1700.0	0.0	0.0	BR# 488
11	361793.0	3801439.0	1675.0	0.0	0.0	BR# 489
11	361793.0	3801542.0	1700.0	0.0	0.0	BR# 490
11	361805.0	3801646.0	1700.0	0.0	0.0	BR# 491
11	361756.0	3801756.0	1700.0	0.0	0.0	BR# 492
11	361732.0	3801866.0	1650.0	0.0	0.0	BR# 493
11	361768.0	3801951.0	1700.0	0.0	0.0	BR# 494
11	361720.0	3802037.0	1675.0	0.0	0.0	BR# 495
11	361683.0	3802122.0	1600.0	0.0	0.0	BR# 496
11	361659.0	3802220.0	1575.0	0.0	0.0	BR# 497
11	361622.0	3802323.0	1575.0	0.0	0.0	BR# 498
11	361610.0	3802439.0	1575.0	0.0	0.0	BR# 499
11	361573.0	3802561.0	1575.0	0.0	0.0	BR# 500
11	361561.0	3802659.0	1525.0	0.0	0.0	BR# 501
11	361573.0	3802780.0	1500.0	0.0	0.0	BR# 502
11	361610.0	3802878.0	1550.0	0.0	0.0	BR# 503
11	361634.0	3802963.0	1500.0	0.0	0.0	BR# 504
11	361720.0	3803024.0	1475.0	0.0	0.0	BR# 505
11	361780.0	3803024.0	1475.0	0.0	0.0	BR# 506
11	361793.0	3803122.0	1425.0	0.0	0.0	BR# 507

ESWMF DISPERSION POST PROCESSING

MODEL INPUT FILES

P:\snamdm\130\els.mdl

```
elsco8.out
2
2
4
1 8 17 24
2
9 16
8
3
elsflr13.seq
1.89
elsflr2.seq
1.89
elslfc13.seq
1.45e-6
elslfc2.seq
3.63e-6
```

```
elsno1.out
2
2
4
1 8 17 24
2
9 16
24
3
elsflr13.seq
6.67
elsflr2.seq
6.67
elslfc13.seq
1.41e-6
elslfc2.seq
8.21e-6
▓
```

```
elsno24.out
2
2
4
1 8 17 24
2
9 16
24
3
elsflr13.seq
6.67
elsflr2.seq
6.67
elslfc13.seq
1.41e-6
elslfc2.seq
8.21e-6
```

```
elsnoann.out
2
2
4
1 8 17 24
2
9 16
8760
3
elsflr13.seq
6.67
elsflr2.seq
6.67
elslfc13.seq
1.41e-6
elslfc2.seq
8.21e-6
```

```
elspmann.out
4
2
4
1 8 17 24
2
9 16
24
3
elsflr13.seq
6.33
elsflr2.seq
6.33
elslfc13.seq
3.33e-7
elslfc2.seq
7.65e-6
elsphl13.seq
1.6e-2
elsphl2.seq
9.58e-2
elsuhl13.seq
2.79e-1
elsuhl2.seq
1.67
```

```
elspmann.out
4
2
4
1 8 17 24
2
9 16
8760
3
elsflr13.seq
6.33
elsflr2.seq
6.33
elslfc13.seq
3.33e-7
elslfc2.seq
7.65e-6
elsphl13.seq
1.6e-2
elsphl2.seq
9.58e-2
elsuhl13.seq
2.79e-1
elsuhl2.seq
1.67
```

```
elscso1.out
2
2
4
1 8 17 24
2
9 16
1
3
elsflr13.seq
2.11
elsflr2.seq
2.11
elslfc13.seq
1.42e-7
elslfc2.seq
8.98e-7
```

```
elscso24.out
2
2
4
1 8 17 24
2
9 16
24
3
elsflr13.seq
2.11
elsflr2.seq
2.11
elslfc13.seq
1.42e-7
elslfc2.seq
8.98e-7
```

```
elscso3.out
2
2
4
1 8 17 24
2
9 16
3
3
elsflr13.seq
2.11
elsflr2.seq
2.11
elslfc13.seq
1.42e-7
elslfc2.seq
8.98e-7
```

```
elssoann.out
3
2
4
1 8 17 24
2
9 16
8760
3
elsflr13.seq
2.11
elsflr2.seq
2.11
elslfc13.seq
1.42e-7
elslfc2.seq
8.98e-7
elsanc13.seq
0.00
elsanc2.seq
0.00
```

APPENDIX E

HEALTH RISK ANALYSIS

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APPENDIX E
HEALTH RISK ANALYSIS

1.0 INTRODUCTION

This screening health risk assessment has been performed to support the EIS/EIR for the proposed ESWMF. The assessment evaluates the risk, through the inhalation pathway, of various air toxics substances which may be emitted from proposed facility during the operation phase of the project. The risk assessment provides an upper-bound estimate of risk using health-conservative exposure assumptions.

Section 2.0 of this appendix presents a hazard identification, which includes a list of toxic substances emitted from the proposed facility and identifies those substances as either carcinogens or non-carcinogens (health risks are assessed differently for substances depending upon whether they are identified as either carcinogenic or non-carcinogenic).

Section 3.0 presents an exposure assessment, which describes the estimation of emissions (i.e., amount of each substance released into the air) from the proposed project, and the air dispersion modeling methodology used to estimate the concentrations in air of toxic air contaminants at ground-level receptor locations.

In Section 4.0, health risks with the estimated concentrations in air of the toxic air contaminants were characterized using toxicity values provided by the State of California. The risk characterization presented numerical estimates of the increased lifetime carcinogenic risk associated with inhalation of carcinogenic air contaminants. The potential for adverse health effects from non-carcinogenic pollutants was characterized by comparing estimated concentrations in air with acceptable exposure levels.

2.0 HAZARD IDENTIFICATION

Toxic air contaminants associated with the proposed project would be emitted from landfill gas flares, a fueling area, the surface of the landfill and from permanent mobile sources operating on the landfill (i.e., caterpillar tractor trucks, etc.). Initially, two flares would be installed, increasing to a total potential of ten flares to accommodate increased landfill gas production over time. For purposes of air dispersion modeling (discussed further in Section 3.0), the flares have been co-located as a single point source. The fueling area was represented in the air dispersion model as an area source, the landfill was modeled as 33 area sources, and mobile source emissions were included in 11 of those area sources. A brief description of each source and location is summarized in Table 1.

Toxic air contaminants evaluated in the health risk assessment were identified from the list of toxics presented in Appendix B-1 of the CAPCOA Air Toxics "Hot Spots" Program Risk Assessments Guidelines (CAPCOA, 1992). These substances are listed in Table 2. Table 3 lists all carcinogens that are emitted by the proposed landfill and related sources, and the total annual amount emitted in pounds per year (lbs/yr). Table 4 lists all substances to be evaluated for non-carcinogenic chronic effects, their sources and the total amount emitted in lbs/yr. Table 5 lists all substances evaluated for non-carcinogenic acute effects (lbs/hr).

3.0 EXPOSURE ASSESSMENT

Exposure is the potential contact of an individual to a substance. Exposure assessment consists of the estimation of the magnitude, frequency, duration, and routes of exposure to a chemical. Human exposure to substance is typically evaluated by estimating the amount that could come into contact with the lungs, gastrointestinal tract, or skin during a specified period of time. This exposure assessment is based on scenarios that define human populations that may be exposed to toxic air contaminants potentially emitted from the proposed project.

The exposure assessment for the proposed landfill addresses inhalation exposure of toxic air contaminants emitted from the proposed project using emissions estimation techniques and air dispersion model algorithms recommended for use in health risk assessments prepared under the Air Toxic's "Hot Spots" Program (CAPCOA, 1992) and the South Coast Air Quality Management District. The steps used in the exposure assessment were:

- Quantification of emissions to the air from the project, using worst case assumptions of maximum emission rates;

- Modeling the dispersion of the emitted toxic air contaminants; and

- Estimating concentrations in air of toxic air contaminants at specific receptors (i.e. locations of human habitations).

The exposure assessment was then used to estimate the potential risks using these steps:

- Using toxicity values for each chemical to estimate the risks attributed to the concentration of that chemical.

- Combining all calculated risks into total estimates and comparing these to the significance criteria.

3.1 EMISSIONS ESTIMATION

3.1.1 LANDFILL GAS EMISSIONS

The Landfill Air Emissions Estimation Model (LAEEM) Version 1.1, written by the U.S. EPA, provides landfill gas generation rates for methane, carbon dioxide, non-methane organic compounds (NMOC) and selected toxic pollutants. The LAEEM was used to estimate toxic emissions from the proposed landfill. Unlike conventional emission factors which yield constant emissions over the life of a landfill, the LAEEM takes the age and volume of waste contained in the landfill, along with several other site-specific variables, and calculates a emission output over time. The LAEEM predicted that the highest emissions of landfill gas for the proposed project would occur in the final year of landfill operation (year 32).

Selections of model parameters were based on U.S. EPA recommendations that are used (Radian, 1992) in the application of the landfill model for the preparation of State Implementation Plans (SIPs). The values used assumed that the proposed landfill waste would be primarily residential and that rainfall at the site was moderate. The values for toxic landfill gas constituent concentrations were obtained from the California Air Resources Board (CARB, 1990).

Toxic pollutant emissions from both the landfill gas (fugitive emissions) and the landfill gas flare (flare emissions) are presented in Tables 6 and 7. Fugitive emissions from the landfill were calculated by assuming that 70% of the landfill gas generated, as calculated by the LAEEM, would be collected by the landfill gas recovery system and 30% of the landfill gas generated, as calculated by the LAEEM, would be lost as fugitives. This is a conservative estimate since SCAQMD Rule 1150.1 regulates the quantity of surface concentrations of landfill gas compounds and the landfill cover is monitored for fugitive leaks. The equation used to determine fugitive emissions is presented below:

$$Emissions\ (lb/hr) = \frac{LAEEM\ output,\ 32nd\ year,\ Mg}{yr} \times \frac{10^6\ g}{Mg} \times \frac{lb}{453.6\ g} \times \frac{yr}{8760\ hr} \times 0.3$$

Toxic emissions from the flare were calculated in a similar fashion. The LAEEM output was multiplied by 0.7, assuming that the landfill gas recovery system will collect 70% of the landfill gas. A destruction efficiency of 99% was assumed for all toxic compounds incinerated in the flare (Chen, SCAQMD, 1992). The following equation was used to assess toxic emissions from the flare:

$$Emissions\ (lb/hr) = \frac{LAEEM\ output,\ 32nd\ year,\ Mg}{yr} \times \frac{10^6\ g}{Mg} \times \frac{lb}{453.6\ g} \times \frac{yr}{8760\ hr} \times 0.7 \times (1-99\%)$$

The emissions that are predicted to occur during the maximum gas generation year were used as a worst case basis for the health risk analysis. This was done to assure that the risk estimates would be conservative.

3.1.2 EMISSIONS FROM DIESEL AND GASOLINE FUELING OPERATIONS

10,000 Gallon Gasoline Storage Tank

Reactive organic compound (ROC) emissions may result from storage tank operations. Emission factors and equations from Section 4 of the U.S. EPA's Compilation of Air Pollutant Emission Factors (1985) were used in the air quality section of this document to determine total ROC emissions. Worst case daily emissions of ROCs represent emissions expressed in pounds per hour on a day when the entire tank is loaded. Annual emissions represent a yearly average value expressed in tons per year based on the throughput of the gasoline. Columns 3 and 5 of Table 8 present the values in pounds per hour and tons per year, respectively, taken from the air quality section of this document.

Emission factors for toxic constituents in gasoline were taken from the CARB Identification of Volatile Organic Compound Species Profiles, profile #721, for liquid gas, unleaded regular, winter profile (1989). Emissions quantification was limited to those constituents which are considered toxic under SCAQMD Rule 1401 (SCAQMD, 1990). Table 7 presents the emissions for toxic compounds in pounds per hour and in tons per year. The equations used to calculate these emissions are indicated below:

$$Emissions\ (lb/hr) = \frac{ROG\ emissions,\ lb}{hour} \times weight\ fraction\ of\ toxic\ constituent$$

$$Emissions\ (ton/yr) = \frac{ROG\ emissions,\ ton}{year} \times weight\ fraction\ of\ toxic\ constituent$$

50,000 Gallon Diesel Fuel Storage Tank

Reactive organic compound (ROC) emissions may result from storage tank operations. Emission factors and equations from Section 4 of the U.S. EPA's Compilation of Air Pollutant Emission Factors (1985) were used in the air quality section of this document to determine total ROC emissions. Worst case daily emissions of ROCs represent emissions expressed in pounds per hour on a day when the entire tank is loaded. Annual emissions represent a yearly average value expressed in tons per year based on the throughput of the diesel fuel. Columns 3 and 5 of Table 8 present the values in pounds per hour and tons per year, respectively, taken from the air quality section of this document.

Due to the low volatility of diesel fuel, there are fewer reference emission factors for its toxic constituents. Emission factors for toxic constituents in diesel fuel were therefore taken from two different sources. Emissions quantification was limited to those constituents which are considered toxic under SCAQMD Rule 1401 (SCAQMD, 1990). The weight fraction for benzene in diesel fuel was taken from an actual source test done on a typical diesel fuel storage tank (BTC Environmental Inc., 1990). The weight fraction data for benzo(a)pyrene comes from the California State Regional Water Resources Control Board (1986). Table 8 presents the emissions for toxic compounds in pounds per hour and in tons per year. The equations listed above for the 10,000 gallon gasoline storage tank were also used to calculate emissions from the 50,000 diesel fuel storage tank.

Mobile Landfill Equipment Emissions

Landfill operating equipment are exempt from SCAQMD permitting requirements as mobile sources (Rule 219). Mobile source emissions are also not currently considered in the AB 2588 Air Toxic "Hot Spots" Risk Assessments of existing landfills (LA County Sanitation District, 1993). However, since diesel exhaust contains toxic air contaminants, the mobil sources proposed for the project were evaluated for the potential to create impacts on public health. The emissions were quantified using emission factors from the SCAQMD and the quantities of diesel fuel that would be required to operate the proposed landfill equipment. The calculations are presented in the tables at the end of this appendix.

3.2 AIR DISPERSION MODELING

Air dispersion modeling was performed to simulate the transport of the emissions and to calculate concentrations in air near the facility. The air dispersion modeling methodology follows guidelines outlined by the Air Toxics "Hot Spots" Program (CAPCOA, 1992) and discussions with the South Coast Air Quality Management District (SCAQMD) in June and October 1992 and June of 1993 (SCAQMD, 1992).

The Integrated Guassian Model (IGM) has incorporated the EPA-approved Industrial Source Complex - Short Term 2 (ISC2) and COMPLEX I model algorithms and was used to perform dispersion modeling. Both of the model algorithms are recommended by EPA for analysis of air quality impacts, and are also recommended for use in health risk assessments (EPA, 1986; CAPCOA, 1992). The ISC2 algorithm is suitable for estimating concentrations in flat terrain (i.e., terrain elevation that is equal to or lower than the emission sources) while the COMPLEX I algorithm is suitable for estimating concentrations in hilly or complex terrain (terrain elevation that is higher than the emission sources).

The model was used to calculate ambient air concentrations of toxic air emissions. Toxic air pollutants would be emitted from a flare, the fugitive landfill gas emissions, a gasoline and diesel fueling area, and mobile sources on the landfill. Emissions from the flares were modeled as a single point source. Emissions from the refueling area, the landfill and mobile sources were modeled as area sources. The landfill was divided into 33 area sources and the mobile sources were included into 11 of the 33 area sources representing the last phase of the landfill operation. A total of 35 sources (one point source and 34 area sources) were modeled.

Tables 9 and 10 identify each source and lists the source parameters that were used in the dispersion modeling. Source parameters used in modeling include source locations (by UTM coordinates), elevation, emission height, stack diameter, gas temperature, exit velocity and area (for area sources).

The terrain within the modeling region (i.e., a 5 km receptor grid extending from the property boundary) is hilly with elevations above and below that of the facility. The simple terrain model ISC2 and the complex terrain model COMPLEX I algorithms were used to calculate health hazards at all receptors. The health effects at receptors with terrain elevations at or below the height of the flare (point source) were calculated using the ISC2 algorithm. Health effects at receptors with terrain elevations greater than the height of the flare and equal to or below the final plume centerline (plume height of the centerline was obtained calculated using the SCREEN air dispersion model) were calculated using both ISC2 and COMPLEX I algorithms; the greater of the two model results were used in the health risk assessment. Receptors with elevations greater than the height of the final plume centerline were modeled with the COMPLEX I algorithm.[1] The surrounding area can be characterized as rural; therefore, the region was represented as rural in the dispersion models.

The IGM model requires hourly average wind direction, wind speed, ambient temperature, and mixing heights. The 1981 meteorological data used in the modeling analysis was supplied by the SCAQMD. The most representative data set for the proposed landfill is derived from Newhall wind data, Burbank surface data and Ontario mixing height data. The Newhall station is located approximately 7 km west-northwest of the proposed site, Burbank is located approximately 30 km south, and Ontario is located approximately 90 km southeast of the proposed landfill location. The combined surface and upper air data were formatted to be compatible with the IGM model using an EPA-developed meteorological pre-processing program.

The Maximum Exposed Individual (MEI) locations were determined using a combination of a fine receptor grid with 100-meter spacing along the property boundary and a coarse Cartesian grid with 500-meter spaces extending approximately 2 km from the plant's boundary. Once the MEIs were located, normalized emission rates of 1 gram/second were used as input to the models. The locations of the special receptors were also input to the model. The models were then instructed to output the normalized concentration from each source for each MEI and special receptor. Normalized concentrations were multiplied by each source's pollutant-specific emission rate (Tables 14 and 15) to obtain pollutant-specific concentrations. These specific concentrations from each of the 35 sources are summed for each MEI and special receptor to obtain the ambient concentration of each pollutant at each receptor location.

The air quality modeling procedure used for this health risk assessment consisted of the following steps:

- Step 1 is to calculate carcinogenic, chronic non-carcinogenic, and acute non-carcinogenic emission potency. The emission potency for carcinogens from each source is the sum of the products of emission rates times unit risk values (URV). For non-carcinogens the emission potency for each source is the sum of the quotient of emission rates divided by acceptable exposure levels (AEL). Tables 11 and 12 present the annual-average and the maximum hourly (respectively) emission rates of each substance from each source. Emission potency values for

[1] Please note that COMPLEX I algorithm cannot simulate releases from area sources, therefore results from the ISC2 model algorithm were calculated and used.

carcinogens, chronic non-carcinogens, and acute non-carcinogens are presented in Tables 13, 14, and 15.

- Step 2 is to input the emission potency values for each of the sources to the IGM dispersion model and to calculate receptor risk values at various receptor locations.

- Step 3 is the identification of the maximum exposed individual (MEI) for carcinogens, chronic non-carcinogens, and acute non-carcinogens.

- Step 4 includes the calculation of individual substance concentrations at each of the key receptor locations.

The results are discussed below in Section 4.0.

3.3 EXPOSURE ESTIMATION

Concentrations in the air were modeled for the MEIs, residential and sensitive (special receptors) receptors. The MEI is a hypothetical individual assumed to be located at the point where the highest concentrations in the air are expected to be found (regardless of the land use surrounding the proposed landfill).[2] The Special Receptors were chosen as the seven nearest residences, Juvenile Hall and Olive View Hospital.

The MEI (carcinogenic risk) location was identified by determining the location of maximum carcinogenic risk. The location of the greatest chronic non-carcinogenic health effect (chronic MEI) was identified as the location of the greatest chronic hazard index. Similarly, the location of the greatest acute non-carcinogenic health effect (acute MEI) was identified as the location of greatest acute hazard index. In this approach the pollutant-specific emission rates were multiplied by the pollutant-specific unit risk values, summed and used as input to the dispersion models (see Table 11). The modeling results were in terms of risk, not concentration. The receptor with the greatest model-predicted carcinogenic risk was designated as the

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[2]The rationale for evaluating health risks for an MEI is that estimated risks to all other individuals will be lower; health risks considered acceptable at the MEI will likely be acceptable at all other receptors. The health risk assessment assumes that the MEI lives continuously for a lifetime (70 years) at the point of highest concentration in air estimated by dispersion modeling and is exposed through inhalation. The assumption of lifetime, continuous exposure is health-protective but is consistent with the numerical indicators of toxicity used in the health risk assessment. These numerical indicators also assume continuous lifetime exposure.

carcinogenic MEI. Similarly, the chronic and acute MEIs were located by dividing the pollutant-specific chronic and acute AELs, summing and using them as input to the dispersion models to predict results in terms of chronic and acute hazard indices, not concentrations. The receptors with the highest chronic and acute hazard index were designated the chronic and acute non-carcinogenic MEIs.

4.0 RISK CHARACTERIZATION

Health risks associated with emissions from the landfill are characterized in this section. This involves evaluating the exposure data developed in Section 3.0 in terms of carcinogenic risk and the potential for acute or chronic non-carcinogenic health effects. Health risks were characterized using numerical values of toxicity recommended for the Air Toxics "Hot Spots" Program health risk assessments (CAPCOA, 1992 and updates). Carcinogenic risks were estimated using unit risk values (for risk from inhalation exposure). Chronic and acute non-carcinogenic effects were evaluated by comparison of chemical concentrations in air (or exposure rates through inhalation) with Acceptable Exposure Levels (AELs) (CAPCOA, 1992 and updates).

4.1 CARCINOGENIC RISK ESTIMATES

Carcinogenic risks were characterized in terms of excess lifetime carcinogenic risk. Excess lifetime carcinogenic risk is an estimate of the increased carcinogenic risk an individual could expect from a 70-year lifetime of exposure to the predicted maximum worst case project emissions. Given the conservative assumptions used in the health risk assessment the calculated values are an upper bound estimate. Tables 16 and 17 list pollution concentrations and the carcinogenic risks based on the worst case year's emissions (by source and pollutant) attributable to inhalation at the MEI and the identified special receptor locations.

The maximum excess lifetime carcinogenic risk at the residential and occupational MEIs are predicted to be 2.6×10^{-6} and 2.1×10^{-6}, respectively, when the mobil source emissions are included. The risks associated with toxic air contaminant concentrations at the MEIs are well below 10×10^{-6} (for sources with T-BACT) risk criteria. Risks were also calculated at other receptors which were the locations of residences or other sensitive inhabited areas. Table 18 indicates the total risk from the proposed project at each of these receptors.

4.2 NON-CARCINOGENIC HEALTH EFFECTS

The Hazard Index (HI) is the calculated exposure level for each contaminant compared to the acceptable level for non-carcinogenic health effects, or a ratio of expected exposure to acceptable exposure. (A hazard index of less than 1.0 is considered to not present a threat of an adverse health effect). Exhaust from mobile sources where included when the following HI values were determined.

The maximum chronic hazard index is 0.21 and is located on the northern property boundary.

The maximum acute non-carcinogenic hazard index is 0.29. The acute non-carcinogenic MEI was located on the southern property boundary and is largely associated with emissions from mobile sources at the landfill.

4.3 REFERENCES

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TABLE 1

SOURCE IDENTIFICATION AND LOCATIONS

Modeling ID No.	Source Description	UTM COORDINATES (x) East (meters)	UTM COORDINATES (y) North (meters)	SOURCE TYPE
1	Flare	364960	3802066	Point
2	Fueling Area	362878	3801610	Area
3	Landfill Area #1	363250	3802375	Area
4	Landfill Area #2	363500	3802375	Area
5	Landfill Area #3	363750	3802375	Area
6	Landfill Area #4	364000	3802500	Area
7	Landfill Area #5	364125	3802500	Area
8	Landfill Area #6	364000	3802375	Area
9	Landfill Area #7	364125	3802375	Area
10	Landfill Area #8	364250	3802375	Area
11	Landfill Area #9	363000	3802125	Area
12	Landfill Area #10	363250	3802125	Area
13	Landfill Area #11	363500	3802125	Area
14	Landfill Area #12	363750	3802000	Area
15	Landfill Area #13	364125	3802000	Area
16	Landfill Area #14/Mobile Sources	362875	3801688	Area
17	Landfill Area #15	363313	3801688	Area
18	Landfill Area #16/Mobile Sources	363750	3801625	Area
19	Landfill Area #17	364125	3801625	Area
20	Landfill Area #18/Mobile Sources	364500	3801875	Area
21	Landfill Area #19	362875	3801250	Area
22	Landfill Area #20	363313	3801250	Area
23	Landfill Area #21/Mobile Sources	363750	3801250	Area
24	Landfill Area #22/Mobile Sources	364125	3801250	Area
25	Landfill Area #23	363000	3801000	Area
26	Landfill Area #24	363250	3801000	Area
27	Landfill Area #25/Mobile Sources	363500	3800875	Area
28	Landfill Area #26/Mobile Sources	363875	3801000	Area
29	Landfill Area #27	363115	3800865	Area
30	Landfill Area #28	362990	3800865	Area
31	Landfill Area #29	363250	3800875	Area
32	Landfill Area #30/Mobile Sources	363375	3800875	Area
33	Landfill Area #31/Mobile Sources	363250	3800750	Area
34	Landfill Area #32/Mobile Sources	363375	3800750	Area
35	Landfill Area #33/Mobile Sources	363500	3800675	Area

TABLE 2
TOXIC EMITTANTS FROM THE PROPOSED ELSMERE LANDFILL

Benzene	C, CNC
Carbon Tetrachloride	C, CNC, ANC
Chloroform	C, CNC
Ethylene Dichloride	C, CNC
Methylene Chloride	C, CNC, ANC
Perchloroethylene	C, CNC, ANC
Trichloroethylene	C, CNC
Vinyl Chloride	C, CNC
Formaldehyde	C, CNC, ANC
PAHs	C
Acetaldehyde	C, CNC
1,3 Butadiene	C
Beryllium	C, CNC
Cadmium	C, CNC
Hexavalent Chromium	C, CNC
Nickel	C, CNC, ANC
Naphthalene	CNC
Acrolein	CNC,ANC
Chlorobenzene	CNC
Toluene	CNC
Xylenes	CNC, ANC
Hydrogen Chloride	CNC, ANC
Arsenic	CNC
Copper	CNC, ANC
Lead	CNC
Manganese	CNC
Mercury	CNC, ANC
Selenium	CNC, ANC
Zinc	CNC

TABLE 3

ANNUAL AVERGE EMISSION RATES FOR CORCINOGENIC RISK

SUBSTANCE	ANNUAL EMISSION (lb/yr)
Benzene	333.97
Carbon Tetrachloride	2.60
Chloroform	1.34
Ethylene Dichloride	7.08
Methylene Chloride	42.14
Perchloroethylene	78.93
Trichloroethylene	49.32
Vinyl Chloride	89.70
Formaldehyde	2580.54
PAHs	38.50
Acetaldehyde	1005.35
1,3 Butadiene	4.24
Beryllium	1.99
Cadmium	3.36
Hexavalent Chlormium	0.38
Nickel	10.85

TABLE 4

ANNUAL AVERGE EMISSION RATES
FOR CHRONIC NON-CARCINOGENIC HEALTH EFFECTS

SUBSTANCE	ANNUAL EMISSION (lb/yr)
Benzene	333.97
Carbon Tetrachloride	2.60
Chloroform	1.34
Ethylene Dichloride	7.08
Methylene Chloride	42.14
Perchloroethylene	78.93
Trichloroethylene	49.32
Vinyl Chloride	89.70
Formaldehyde	2580.54
Napthalene	21.24
Acetaldehyde	1005.35
Acrolein	13.61
Chlorobenzene	0.61
Toluene	79.45
Xylenes	55.31
Hydrogen Chloride	557.98
Arsenic	1.99
Beryllium	1.99
Cadmium	3.36
Hexavalent Chlormium	0.38
Copper	11.30
Lead	19.70
Manganese	4.73
Mercury	0.46
Nickel	10.85
Selenium	1.22
Zinc	60.40

TABLE 5

ANNUAL AVERGE EMISSION RATES
FOR ACUTE NON–CARCINOGENIC HEALTH EFFECTS

SUBSTANCE	ANNUAL EMISSION (lb/hr)
Carbon Tetrachloride	0.00113
Methylene Chloride	3.14
Perchloroethylene	1.64
Formaldehyde	1.16
Acrolein	0.00598
Xylenes	0.024
Hydrogen Chloride	0.245
Copper	0.00498
Mercury	0.000202
Nickel	0.00477
Selenium	0.000539

TABLE 6

TOXIC EMISSIONS FROM ELSMERE LANDFILL (FUGITIVE AND FLARE EMISSIONS) (CHRONIC AND CANCER EFFECTS)

Pollutant	Total content in landfill gas (a) (Mg/yr)	Fugitive loss (30%)	Fugitive emissions lb/hr	Recovery efficiency (70%)	Flare destruction efficiency (b) (1−99%)	Flare emissions lb/hr
Benzene	2.14E−01	0.3	1.6E−02	0.7	0.01	3.8E−04
Carbon Tetrachloride	3.83E−03	0.3	2.9E−04	0.7	0.01	6.7E−06
Chloroform	1.98E−03	0.3	1.5E−04	0.7	0.01	3.5E−06
Ethylene Dichloride	1.05E−02	0.3	7.9E−04	0.7	0.01	1.8E−05
Methylene Chloride	6.16E−02	0.3	4.7E−03	0.7	0.01	1.1E−04
Perchloroethene	1.17E−01	0.3	8.8E−03	0.7	0.01	2.1E−04
Trichloroethene	7.35E−02	0.3	5.5E−03	0.7	0.01	1.3E−04
Vinyl Chloride	1.37E−01	0.3	1.0E−02	0.7	0.01	2.4E−04

(a) Data generated using EPA Landfill Air Emissions Estimation Model, data averaged over a 70 year period. Emission factors for toxic pollutants from CARB.
(b) Personal communication, Jay Chen, SCAQMD

TABLE 7

TOXIC EMISSIONS FROM ELSMERE LANDFILL (FUGITIVE AND FLARE EMISSIONS) (ACUTE EFFECTS)

Pollutant	Total content in landfill gas (a) (Mg/yr)	Fugitive loss (30%)	Fugitive emissions lb/hr	Recovery efficiency (70%)	Flare destruction efficiency (b) (1-99%)	Flare emissions lb/hr
Benzene	2.727E+00	0.3	2.1E-01	0.7	0.01	4.8E-03
Carbon Tetrachloride	1.396E-02	0.3	1.1E-03	0.7	0.01	2.5E-05
Chloroform	2.417E-02	0.3	1.8E-03	0.7	0.01	4.3E-05
Ethylene Dichloride	6.046E+00	0.3	4.6E-01	0.7	0.01	1.1E-02
Methylene Chloride	4.151E+01	0.3	3.1E+00	0.7	0.01	7.3E-02
Perchloroethene	2.142E+01	0.3	1.6E+00	0.7	0.01	3.8E-02
Trichloroethene	7.058E+00	0.3	5.3E-01	0.7	0.01	1.2E-02
Vinyl Chloride	1.156E+01	0.3	8.7E-01	0.7	0.01	2.0E-02
1,1-Dichloroethylene	6.091E-01	0.3	4.6E-02	0.7	0.01	1.1E-03

(a) Data generated using EPA Landfill Air Emissions Estimation Model, model default emission factors for toxics.
(b) Personal communication, Jay Chen, SCAQMD

TABLE 8

TOXIC EMISSIONS FROM FUELING OPERATIONS
DIESEL AND GASOLINE

Fuel type	Toxic constituent	Total ROG emissions (a) (lb/day) (worst case)	Total ROG emissions (lb/hr)	Total ROG emissions (a) (ton/yr) (average)	Weight fraction (dimensionless)	Toxic emissions (lb/hr)	Toxic emissions (ton/yr)
Gasoline							
	Benzene	6.0	0.25	0.57	1.80E−02 (b)	4.50E−03	1.02E−02
Diesel							
	Benzene	1.8	0.08	0.07	1.17E−04 (c)	8.77E−06	8.75E−06
	Benzo(a)pyrene	1.8	0.08	0.07	7.00E−08 (d)	5.25E−09	5.24E−09

(a) Taken from air quality impacts section
(b) CARB Identification of VOC Species Profiles, 1989
(c) BCI source test done on a typical diesel fuel storage tank
(d) CA State Regional Water Resources Control Board

TABLE 9

POINT SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	HEIGHT (meters)	GRADE ELEVATION (feet)	INTERNAL DIAMETER (meters)	TEMPERATURE (Kelvin)	EXIT VELOCITY (meters/second)
1	Flare	12.192	3121.0	2.44	1033.18	4.57

TABLE 10

AREA SOURCE CHARACTERISTICS

Modeling ID No.	Source Description	GRADE ELEVATION (feet)	LENGTH OF SIDE (meters)	AREA OF SOURCE (meters^2)	Effective Release Height (meters)
2	Fueling Operations	1975	44.98	2023.20	0.00
3	Landfill Area #1	2100	250.00	62500.00	0.00
4	Landfill Area #2	2200	250.00	62500.00	0.00
5	Landfill Area #3	2250	250.00	62500.00	0.00
6	Landfill Area #4	2200	125.00	15625.00	0.00
7	Landfill Area #5	2200	125.00	15625.00	0.00
8	Landfill Area #6	2350	125.00	15625.00	0.00
9	Landfill Area #7	2350	125.00	15625.00	0.00
10	Landfill Area #8	2350	125.00	15625.00	0.00
11	Landfill Area #9	2000	250.00	62500.00	0.00
12	Landfill Area #10	2250	250.00	62500.00	0.00
13	Landfill Area #11	2550	250.00	62500.00	0.00
14	Landfill Area #12	2600	375.00	140625.00	0.00
15	Landfill Area #13	2650	375.00	140625.00	0.00
16	Landfill Area #14/Mobile Sources	2100	437.50	191406.25	0.00
17	Landfill Area #15	2700	437.50	191406.25	0.00
18	Landfill Area #16/Mobile Sources	2950	375.00	140625.00	0.00
19	Landfill Area #17	3000	375.00	140625.00	0.00
20	Landfill Area #18/Mobile Sources	2825	375.00	140625.00	0.00
21	Landfill Area #19	2100	437.50	191406.25	0.00
22	Landfill Area #20	2700	437.50	191406.25	0.00
23	Landfill Area #21/Mobile Sources	2950	375.00	140625.00	0.00
24	Landfill Area #22/Mobile Sources	3000	375.00	140625.00	0.00
25	Landfill Area #23	2200	250.00	62500.00	0.00
26	Landfill Area #24	2500	250.00	62500.00	0.00
27	Landfill Area #25/Mobile Sources	2800	375.00	140625.00	0.00
28	Landfill Area #26/Mobile Sources	2850	250.00	62500.00	0.00
29	Landfill Area #27	2100	134.78	18165.65	0.00
30	Landfill Area #28	2350	125.00	15625.00	0.00
31	Landfill Area #29	2450	125.00	15625.00	0.00
32	Landfill Area #30/Mobile Sources	2600	125.00	15625.00	0.00
33	Landfill Area #31/Mobile Sources	2400	125.00	15625.00	0.00
34	Landfill Area #32/Mobile Sources	2500	125.00	15625.00	0.00
35	Landfill Area #33/Mobile Sources	2700	250.00	62500.00	0.00

TABLE 11
(page 1 of 3)
ANNUAL AVERAGE TOXIC EMISSION RATES

Source Description	Benzene (g/s)	Carbon Tetrachloride (g/s)	Chloroform (g/s)	Ethylene Dichloride (g/s)	Methylene Chloride (g/s)	Perchloro-ethylene (g/s)	Trichloro-ethylene (g/s)	Vinyl Chloride (g/s)	Formaldehyde (g/s)	PAHs (g/s)
Flare	4.79E−05	8.44E−07	4.42E−07	2.27E−06	1.39E−05	2.65E−05	1.64E−05	3.02E−05	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	1.20E−08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	7.49E−10	1.36E−11	7.03E−12	3.70E−11	2.20E−10	4.12E−10	2.58E−10	4.68E−10	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	7.49E−10	1.36E−11	7.03E−12	3.70E−11	2.20E−10	4.12E−10	2.58E−10	4.68E−10	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	7.49E−10	1.36E−11	7.03E−12	3.70E−11	2.20E−10	4.12E−10	2.58E−10	4.68E−10	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	1.91E−09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E−08	3.87E−10
Disposal Operations[1] (shift 2)	4.25E−09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.67E−08	8.62E−10
Disposal operations and landfill gas[1] (shifts 1&3)	2.66E−09	1.36E−11	7.03E−12	3.70E−11	2.20E−10	4.12E−10	2.58E−10	4.68E−10	2.65E−08	3.87E−10
Disposal operations and landfill gas[1] (shift 2)	5.00E−09	1.36E−11	7.03E−12	3.70E−11	2.20E−10	4.12E−10	2.58E−10	4.68E−10	5.67E−08	8.62E−10

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 11
(page 2 of 3)
ANNUAL AVERAGE TOXIC EMISSION RATES

SOURCE DESCRIPTION	Napthalene (g/s)	Acetaldehyde (g/s)	Acrolein (g/s)	1,3-Butadiene (g/s)	Chlorobenzene (g/s)	Toluene (g/s)	Xylenes (g/s)	Hydrogen chloride (g/s)	Arsenic (g/s)	Beryllium (g/s)
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-08	1.71E-09	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	2.13E-10	1.01E-08	1.37E-10	4.29E-11	6.16E-12	7.98E-10	5.56E-10	5.61E-09	2.00E-11	2.00E-11
Disposal Operations[1] (shift 2)	4.75E-10	2.25E-08	3.05E-10	9.57E-11	1.37E-11	1.78E-09	1.24E-09	1.25E-08	4.45E-11	4.45E-11
Disposal operations and landfill gas[1] (shifts 1&3)	2.13E-10	1.01E-08	1.37E-10	4.29E-11	6.16E-12	7.98E-10	5.56E-10	5.61E-09	2.00E-11	2.00E-11
Disposal operations and landfill gas[1] (shift 2)	4.75E-10	2.25E-08	3.05E-10	9.57E-11	1.37E-11	1.78E-09	1.24E-09	1.25E-08	4.45E-11	4.45E-11

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 11
(page 3 of 3)
ANNUAL AVERAGE TOXIC EMISSION RATES

SOURCE DESCRIPTION	Cadmium (g/s)	Hexavalent Chromium (g/s)	Copper (g/s)	Lead (g/s)	Manganese (g/s)	Mercury (g/s)	Nickel (g/s)	Selenium (g/s)	Zinc (g/s)
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	3.38E−11	3.84E−12	1.13E−10	1.98E−10	4.76E−11	4.59E−12	1.09E−10	1.23E−11	6.08E−10
Disposal Operations[1] (shift 2)	7.51E−11	8.57E−12	2.53E−10	4.41E−10	1.06E−10	1.03E−11	2.43E−10	2.73E−11	1.35E−09
Disposal operations and landfill gas[1] (shifts 1&3)	3.38E−11	3.84E−12	1.13E−10	1.98E−10	4.76E−11	4.59E−12	1.09E−10	1.23E−11	6.08E−10
Disposal operations and landfill gas[1] (shift 2)	7.51E−11	8.57E−12	2.53E−10	4.41E−10	1.06E−10	1.03E−11	2.43E−10	2.73E−11	1.35E−09

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 12
(page 1 of 3)
MAXIMUM HOURLY TOXIC EMISSION RATES

Source Description	Benzene (g/s)	Carbon Tetrachloride (g/s)	Chloroform (g/s)	Ethylene Dichloride (g/s)	Methylene Chloride (g/s)	Perchloro-ethylene (g/s)	Trichloro-ethylene (g/s)	Vinyl Chloride (g/s)	Formaldehyde (g/s)	PAHs (g/s)
Flare	6.05E−04	3.15E−06	5.42E−06	1.39E−03	9.20E−03	4.79E−03	1.51E−03	2.52E−03	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	1.20E−08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	9.84E−09	5.15E−11	8.43E−11	2.15E−08	1.45E−07	7.49E−08	2.48E−08	4.07E−08	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	9.84E−09	5.15E−11	8.43E−11	2.15E−08	1.45E−07	7.49E−08	2.48E−08	4.07E−08	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	9.84E−09	5.15E−11	8.43E−11	2.15E−08	1.45E−07	7.49E−08	2.48E−08	4.07E−08	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	4.47E−09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.33E−08	9.92E−10
Disposal Operations[1] (shift 2)	5.71E−09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.04E−08	1.24E−09
Disposal operations and landfill gas[1] (shifts 1&3)	1.43E−08	5.15E−11	8.43E−11	2.15E−08	1.45E−07	7.49E−08	2.48E−08	4.07E−08	6.33E−08	9.92E−10
Disposal operations and landfill gas[1] (shift 2)	1.55E−08	5.15E−11	8.43E−11	2.15E−08	1.45E−07	7.49E−08	2.48E−08	4.07E−08	8.04E−08	1.24E−09

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 12
(page 2 of 3)
MAXIMUM HOURLY TOXIC EMISSION RATES

SOURCE DESCRIPTION	Napthalene (g/s)	Acetaldehyde (g/s)	Acrolein (g/s)	1,3-Butadiene (g/s)	Chlorobenzene (g/s)	Toluene (g/s)	Xylenes (g/s)	Hydrogen chloride (g/s)	Arsenic (g/s)	Beryllium (g/s)
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.03E-08	1.71E-09	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	4.96E-10	2.41E-08	3.28E-10	1.03E-10	1.47E-11	1.98E-09	1.24E-09	1.34E-08	4.79E-11	4.79E-11
Disposal Operations[1] (shift 2)	6.20E-10	3.06E-08	4.15E-10	1.31E-10	1.86E-11	2.48E-09	1.74E-09	1.70E-08	6.07E-11	6.07E-11
Disposal operations and landfill gas[1] (shifts 1&3)	4.96E-10	2.41E-08	3.28E-10	1.03E-10	1.47E-11	1.98E-09	1.24E-09	1.34E-08	4.79E-11	4.79E-11
Disposal operations and landfill gas[1] (shift 2)	6.20E-10	3.06E-08	4.15E-10	1.31E-10	1.86E-11	2.48E-09	1.74E-09	1.70E-08	6.07E-11	6.07E-11

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 12
(page 3 of 3)
MAXIMUM HOURLY TOXIC EMISSION RATES

SOURCE DESCRIPTION	Cadmium (g/s)	Hexavalent Chromium (g/s)	Copper (g/s)	Lead (g/s)	Manganese (g/s)	Mercury (g/s)	Nickel (g/s)	Selenium (g/s)	Zinc (g/s)
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations[1] (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas[1] (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total[1] (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations[1] (shifts 1&3)	8.09E−11	9.18E−12	2.73E−10	4.74E−10	1.14E−10	1.10E−11	2.61E−10	2.95E−11	1.45E−09
Disposal Operations[1] (shift 2)	1.03E−10	1.17E−11	3.45E−10	6.02E−10	1.45E−10	1.40E−11	3.31E−10	3.73E−11	1.84E−09
Disposal operations and landfill gas[1] (shifts 1&3)	8.09E−11	9.18E−12	2.73E−10	4.74E−10	1.14E−10	1.10E−11	2.61E−10	2.95E−11	1.45E−09
Disposal operations and landfill gas[1] (shift 2)	1.03E−10	1.17E−11	3.45E−10	6.02E−10	1.45E−10	1.40E−11	3.31E−10	3.73E−11	1.84E−09

[1] Area sources emission rates are in terms of $g/s/m^2$.

TABLE 13
(page 1 of 3)
EMISSION INPUTS USED IN CARCINOGENIC RISK MODELING

Source Description	Benzene	Carbon Tetrachloride	Chloroform	Ethylene Dichloride	Methylene Chloride	Perchloro-ethylene	Trichloro-ethylene	Vinyl Chloride	Formaldehyde	PAHs
Flare	1.39E-09	3.55E-11	2.34E-12	4.55E-11	1.39E-11	1.56E-10	3.28E-11	2.36E-09	0.00E+00	0.00E+00
Fueling Operations (shift 2) (Diesel and Gasoline)	3.48E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total	2.17E-14	5.70E-16	3.72E-17	7.40E-16	2.20E-16	2.43E-15	5.15E-16	3.65E-14	0.00E+00	0.00E+00
Landfill Gas (shifts 1&3)	2.17E-14	5.70E-16	3.72E-17	7.40E-16	2.20E-16	2.43E-15	5.15E-16	3.65E-14	0.00E+00	0.00E+00
Landfill Gas Total (shift 2)	2.17E-14	5.70E-16	3.72E-17	7.40E-16	2.20E-16	2.43E-15	5.15E-16	3.65E-14	0.00E+00	0.00E+00
Disposal Operations (shifts 1&3)	5.54E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.59E-13	6.58E-13
Disposal Operations (shift 2)	1.23E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.40E-13	1.47E-12
Disposal operations and landfill gas (shifts 1&3)	7.71E-14	5.70E-16	3.72E-17	7.40E-16	2.20E-16	2.43E-15	5.15E-16	3.65E-14	1.59E-13	6.58E-13
Disposal operations and landfill gas (shift 2)	1.45E-13	5.70E-16	3.72E-17	7.40E-16	2.20E-16	2.43E-15	5.15E-16	3.65E-14	3.40E-13	1.47E-12

TABLE 13
(page 2 of 3)
EMISSION INPUTS USED IN CARCINOGENIC RISK MODELING

Source Description	Napthalene	Acetaldehyde	Acrolein	1,3-Butadiene	Chlorobenzene	Toluene	Xylenes	Hydrogen chloride	Arsenic	Beryllium
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations (shifts 1&3)	0.00E+00	2.73E-14	0.00E+00	7.29E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.59E-14	4.79E-14
Disposal Operations (shift 2)	0.00E+00	6.08E-14	0.00E+00	1.63E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-13	1.07E-13
Disposal operations and landfill gas (shifts 1&3)	0.00E+00	2.73E-14	0.00E+00	7.29E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.59E-14	4.79E-14
Disposal operations and landfill gas (shift 2)	0.00E+00	6.08E-14	0.00E+00	1.63E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-13	1.07E-13

TABLE 13
(page 3 of 3)
EMISSION INPUTS USED IN CARCINOGENIC RISK MODELING

Source Description	Cadmium	Hexavalent Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	Total Weighted Unit Risk Factor
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E−09
Fueling Operations (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.48E−13
Landfill Gas Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E−14
Landfill Gas (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E−14
Landfill Gas Total (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E−14
Disposal Operations (shifts 1&3)	1.42E−13	5.38E−13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E−14	0.00E+00	0.00E+00	1.73E−12
Disposal Operations (shift 2)	3.16E−13	1.20E−12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.31E−14	0.00E+00	0.00E+00	3.84E−12
Disposal operations and landfill gas (shifts 1&3)	1.42E−13	5.38E−13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.84E−14	0.00E+00	0.00E+00	1.79E−12
Disposal operations and landfill gas (shift 2)	3.16E−13	1.20E−12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.31E−14	0.00E+00	0.00E+00	3.90E−12

TABLE 14
(page 1 of 3)
EMISSION INPUTS USED FOR CHRONIC NON–CARCINOGENIC MODELING

Source Description	Benzene	Carbon Tetrachloride	Chloroform	Ethylene Dichloride	Methylene Chloride	Perchloro–ethylene	Trichloro–ethylene	Vinyl Chloride	Formaldehyde	PAHs
Flare	6.75E–07	3.52E–07	1.26E–08	2.39E–08	4.62E–09	7.56E–07	2.56E–08	1.16E–06	0.00E+00	---
Fueling Operations (shift 2) (Diesel and Gasoline)	1.69E–10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	---
Landfill Gas Total	1.06E–11	5.66E–12	2.01E–13	3.89E–13	7.34E–14	1.18E–11	4.03E–13	1.80E–11	0.00E+00	---
Landfill Gas (shifts 1&3)	1.06E–11	5.66E–12	2.01E–13	3.89E–13	7.34E–14	1.18E–11	4.03E–13	1.80E–11	0.00E+00	---
Landfill Gas Total (shift 2)	1.06E–11	5.66E–12	2.01E–13	3.89E–13	7.34E–14	1.18E–11	4.03E–13	1.80E–11	0.00E+00	---
Disposal Operations (shifts 1&3)	2.69E–11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.35E–09	---
Disposal Operations (shift 2)	5.99E–11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E–08	---
Disposal operations and landfill gas (shifts 1&3)	3.74E–11	5.66E–12	2.01E–13	3.89E–13	7.34E–14	1.18E–11	4.03E–13	1.80E–11	7.35E–09	---
Disposal operations and landfill gas (shift 2)	7.04E–11	5.66E–12	2.01E–13	3.89E–13	7.34E–14	1.18E–11	4.03E–13	1.80E–11	1.57E–08	---

TABLE 14
(page 2 of 3)
EMISSION INPUTS USED FOR CHRONIC NON–CARCINOGENIC MODELING

Source Description	Napthalene	Acetaldehyde	Acrolein	1,3–Butadiene	Chlorobenzene	Toluene	Xylenes	Hydrogen chloride	Arsenic	Beryllium
Flare	0.00E+00	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fueling Operations (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	---	0.00E+00	5.14E–11	5.71E–12	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total	0.00E+00	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Landfill Gas Total (shift 2)	0.00E+00	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Disposal Operations (shifts 1&3)	1.52E–11	1.12E–09	6.84E–09	---	8.80E–14	3.99E–12	1.85E–12	8.01E–10	3.99E–11	4.16E–09
Disposal Operations (shift 2)	3.40E–11	2.50E–09	1.52E–08	---	1.96E–13	8.89E–12	4.13E–12	1.78E–09	8.90E–11	9.27E–09
Disposal operations and landfill gas (shifts 1&3)	1.52E–11	1.12E–09	6.84E–09	---	8.80E–14	3.99E–12	1.85E–12	8.01E–10	3.99E–11	4.16E–09
Disposal operations and landfill gas (shift 2)	3.40E–11	2.50E–09	1.52E–08	---	1.96E–13	8.89E–12	4.13E–12	1.78E–09	8.90E–11	9.27E–09

TABLE 14
(page 3 of 3)
EMISSION INPUTS USED FOR CHRONIC NON–CARCINOGENIC MODELING

Source Description	Cadmium	Hexavalent Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	Total Weighted Acceptable Exposure Level
Flare	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E–06
Fueling Operations (shift 2) (Diesel and Gasoline)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E–10
Landfill Gas Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E–11
Landfill Gas (shifts 1&3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E–11
Landfill Gas Total (shift 2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.71E–11
Disposal Operations (shifts 1&3)	9.65E–12	1.92E–09	4.73E–11	1.32E–10	1.19E–10	1.53E–11	4.55E–10	2.46E–11	1.74E–11	2.31E–08
Disposal Operations (shift 2)	2.15E–11	4.28E–09	1.06E–10	2.94E–10	2.65E–10	3.42E–11	1.01E–09	5.47E–11	3.86E–11	5.08E–08
Disposal operations and landfill gas (shifts 1&3)	9.65E–12	1.92E–09	4.73E–11	1.32E–10	1.19E–10	1.53E–11	4.55E–10	2.46E–11	1.74E–11	2.32E–08
Disposal operations and landfill gas (shift 2)	2.15E–11	4.28E–09	1.06E–10	2.94E–10	2.65E–10	3.42E–11	1.01E–09	5.47E–11	3.86E–11	5.09E–08

TABLE 15
(page 1 of 3)
EMISSION INPUTS USED FOR ACUTE NON–CARCINOGENIC MODELING

Source Description	Benzene	Carbon Tetrachloride	Chloroform	Ethylene Dichloride	Methylene Chloride	Perchloro–ethylene	Trichloro–ethylene	Vinyl Chloride	Formaldehyde	PAHs
Flare	---	1.66E–08	---	---	2.63E–06	7.04E–07	---	---	0.00E+00	---
Fueling Operations (shift 2) (Diesel and Gasoline)	---	0.00E+00	---	---	0.00E+00	0.00E+00	---	---	0.00E+00	---
Landfill Gas Total	---	2.71E–13	---	---	4.15E–11	1.10E–11	---	---	0.00E+00	---
Landfill Gas (shifts 1&3)	---	2.71E–13	---	---	4.15E–11	1.10E–11	---	---	0.00E+00	---
Landfill Gas Total (shift 2)	---	2.71E–13	---	---	4.15E–11	1.10E–11	---	---	0.00E+00	---
Disposal Operations (shifts 1&3)	---	0.00E+00	---	---	0.00E+00	0.00E+00	---	---	1.71E–10	---
Disposal Operations (shift 2)	---	0.00E+00	---	---	0.00E+00	0.00E+00	---	---	2.17E–10	---
Disposal operations and landfill gas (shifts 1&3)	---	2.71E–13	---	---	4.15E–11	1.10E–11	---	---	1.71E–10	---
Disposal operations and landfill gas (shift 2)	---	2.71E–13	---	---	4.15E–11	1.10E–11	---	---	2.17E–10	---

TABLE 15
(page 2 of 3)
EMISSION INPUTS USED FOR ACUTE NON-CARCINOGENIC MODELING

Source Description	Napthalene	Acetaldehyde	Acrolein	1,3-Butadiene	Chlorobenzene	Toluene	Xylenes	Hydrogen chloride	Arsenic	Beryllium
Flare	---	---	0.00E+00	---	---	---	0.00E+00	0.00E+00	---	---
Fueling Operations (shift 2) (Diesel and Gasoline)	---	---	0.00E+00	---	---	---	3.89E-13	0.00E+00	---	---
Landfill Gas Total	---	---	0.00E+00	---	---	---	0.00E+00	0.00E+00	---	---
Landfill Gas (shifts 1&3)	---	---	0.00E+00	---	---	---	0.00E+00	0.00E+00	---	---
Landfill Gas Total (shift 2)	---	---	0.00E+00	---	---	---	0.00E+00	0.00E+00	---	---
Disposal Operations (shifts 1&3)	---	---	1.31E-10	---	---	---	2.82E-13	4.47E-12	---	---
Disposal Operations (shift 2)	---	---	1.66E-10	---	---	---	3.95E-13	5.67E-12	---	---
Disposal operations and landfill gas (shifts 1&3)	---	---	1.31E-10	---	---	---	2.82E-13	4.47E-12	---	---
Disposal operations and landfill gas (shift 2)	---	---	1.66E-10	---	---	---	3.95E-13	5.67E-12	---	---

TABLE 15
(page 3 of 3)
EMISSION INPUTS USED FOR ACUTE NON-CARCINOGENIC MODELING

Source Description	Cadmium	Hexavalent Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	Total Weighted Acceptable Exposure Level
Flare	---	---	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	---	3.35E-06
Fueling Operations (shift 2) (Diesel and Gasoline)	---	---	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	---	3.89E-13
Landfill Gas Total	---	---	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	---	5.28E-11
Landfill Gas (shifts 1&3)	---	---	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	---	5.28E-11
Landfill Gas Total (shift 2)	---	---	0.00E+00	0.00E+00	---	0.00E+00	0.00E+00	0.00E+00	---	5.28E-11
Disposal Operations (shifts 1&3)	---	---	2.73E-11	3.16E-10	---	3.67E-13	2.61E-10	1.48E-11	---	9.26E-10
Disposal Operations (shift 2)	---	---	3.45E-11	4.01E-10	---	4.66E-13	3.31E-10	1.87E-11	---	1.18E-09
Disposal operations and landfill gas (shifts 1&3)	---	---	2.73E-11	3.16E-10	---	3.67E-13	2.61E-10	1.48E-11	---	9.78E-10
Disposal operations and landfill gas (shift 2)	---	---	3.45E-11	4.01E-10	---	4.66E-13	3.31E-10	1.87E-11	---	1.23E-09

TABLE 16

ANNUAL TOXIC CONCENTRATIONS
(page 1 of 3)

Receptor Description	Benzene (ug/m^3)	Carbon Tetrachloride (ug/m^3)	Chloroform (ug/m^3)	Ethylene Dichloride (ug/m^3)	Methylene Chloride (ug/m^3)	Perchloro-ethylene (ug/m^3)	Trichloro-ethylene (ug/m^3)	Vinyl Chloride (ug/m^3)	Formaldehyde (ug/m^3)	PAHs (ug/m^3)
Carcinogenic MEI[1]	2.98E−02	2.60E−04	1.30E−04	7.00E−04	4.16E−03	7.79E−03	4.88E−03	8.85E−03	2.15E−01	3.17E−03
Chronic non−carcinogenic MEI[2]	2.65E−02	2.10E−04	1.10E−04	5.80E−04	3.42E−03	6.41E−03	4.02E−03	7.28E−03	2.04E−01	3.01E−03
Residence #A[3]	4.78E−03	4.00E−05	2.00E−05	1.10E−04	6.40E−04	1.21E−03	7.50E−04	1.37E−03	3.57E−02	5.20E−04
Residence #B[4]	3.15E−03	2.00E−05	1.00E−05	7.00E−05	4.00E−04	7.50E−04	4.70E−04	8.50E−04	2.46E−02	3.60E−04
Residence #C[5]	3.44E−03	3.00E−05	2.00E−05	8.00E−05	5.00E−04	9.30E−04	5.80E−04	1.06E−03	2.40E−02	3.50E−04
Residence #D[6]	5.57E−03	6.00E−05	3.00E−05	1.50E−04	9.10E−04	1.70E−03	1.06E−03	1.93E−03	3.43E−02	5.00E−04
Residence #E[7]	3.28E−03	3.00E−05	2.00E−05	9.00E−05	5.10E−04	9.50E−04	5.90E−04	1.08E−03	2.16E−02	3.20E−04
Residence #F[8]	4.34E−03	4.00E−05	2.00E−05	1.10E−04	6.60E−04	1.24E−03	7.80E−04	1.41E−03	2.85E−02	4.20E−04
Residence #G[9]	4.67E−03	4.00E−05	2.00E−05	1.10E−04	6.70E−04	1.25E−03	7.80E−04	1.42E−03	3.30E−02	4.80E−04
Juvinile Hall[10]	2.94E−03	3.00E−05	1.00E−05	7.00E−05	4.30E−04	8.00E−04	5.00E−04	9.10E−04	2.05E−02	3.00E−04
Olive View Hospital[11]	3.15E−03	2.00E−05	1.00E−05	7.00E−05	4.00E−04	7.50E−04	4.70E−04	8.50E−04	2.46E−02	3.60E−04

1 Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
2 Receptor UTM Coordinates; East (x) 364146 meters, North (y) 3802740 meters.
3 Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
4 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
5 Receptor UTM Coordinates; East (x) 363268 meters, North (y) 3805244 meters.
6 Receptor UTM Coordinates; East (x) 361610 meters, North (y) 3801854 meters.
7 Receptor UTM Coordinates; East (x) 362220 meters, North (y) 3799805 meters.
8 Receptor UTM Coordinates; East (x) 363098 meters, North (y) 3799390 meters.
9 Receptor UTM Coordinates; East (x) 362585 meters, North (y) 3804878 meters.
10 Receptor UTM Coordinates; East (x) 363500 meters, North (y) 3798122 meters.
11 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.

TABLE 16

ANNUAL TOXIC CONCENTRATIONS
(page 2 of 3)

Receptor Description	Napthalene (ug/m³)	Acetaldehyde (ug/m³)	Acrolein (ug/m³)	1,3-Butadiene (ug/m³)	Chlorobenzene (ug/m³)	Toluene (ug/m³)	Xylenes (ug/m³)	Hydrogen chloride (ug/m³)	Arsenic (ug/m³)	Beryllium (ug/m³)
Carcinogenic MEI[1]	1.74E-03	8.26E-02	1.12E-03	3.50E-04	5.04E-05	6.53E-03	4.55E-03	4.59E-02	1.60E-04	1.60E-04
Chronic non-carcinogenic MEI[2]	1.66E-03	7.85E-02	1.07E-03	3.30E-04	4.79E-05	6.21E-03	4.32E-03	4.36E-02	1.60E-04	1.60E-04
Residence #A[3]	2.90E-04	1.37E-02	1.90E-04	6.00E-05	8.30E-06	1.08E-03	7.50E-04	7.60E-03	3.00E-05	3.00E-05
Residence #B[4]	2.00E-04	9.45E-03	1.30E-04	4.00E-05	5.80E-06	7.50E-04	5.20E-04	5.25E-03	2.00E-05	2.00E-05
Residence #C[5]	1.90E-04	9.23E-03	1.30E-04	4.00E-05	5.60E-06	7.30E-04	5.10E-04	5.12E-03	2.00E-05	2.00E-05
Residence #D[6]	2.80E-04	1.31E-02	1.80E-04	6.00E-05	8.00E-06	1.04E-03	7.00E-04	7.27E-03	3.00E-05	3.00E-05
Residence #E[7]	1.70E-04	8.24E-03	1.10E-04	4.00E-05	5.00E-06	6.50E-04	4.50E-04	4.58E-03	2.00E-05	2.00E-05
Residence #F[8]	2.30E-04	1.10E-02	1.50E-04	5.00E-05	6.70E-06	8.70E-04	6.00E-04	6.08E-03	2.00E-05	2.00E-05
Residence #G[9]	2.70E-04	1.26E-02	1.70E-04	5.00E-05	7.70E-06	1.00E-03	7.00E-04	7.02E-03	3.00E-05	3.00E-05
Juvinile Hall[10]	1.70E-04	7.85E-03	1.10E-04	3.00E-05	4.80E-06	6.20E-04	4.30E-04	4.36E-03	2.00E-05	2.00E-05
Olive View Hospital[11]	2.00E-04	9.45E-03	1.30E-04	4.00E-05	5.80E-06	7.50E-04	5.20E-04	5.25E-03	2.00E-05	2.00E-05

1 Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
2 Receptor UTM Coordinates; East (x) 364146 meters, North (y) 3802740 meters.
3 Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
4 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
5 Receptor UTM Coordinates; East (x) 363268 meters, North (y) 3805244 meters.
6 Receptor UTM Coordinates; East (x) 361610 meters, North (y) 3801854 meters.
7 Receptor UTM Coordinates; East (x) 362220 meters, North (y) 3799805 meters.
8 Receptor UTM Coordinates; East (x) 363098 meters, North (y) 3799390 meters.
9 Receptor UTM Coordinates; East (x) 362585 meters, North (y) 3804878 meters.
10 Receptor UTM Coordinates; East (x) 363500 meters, North (y) 3798122 meters.
11 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.

TABLE 16

ANNUAL TOXIC CONCENTRATIONS
(page 3 of 3)

Receptor Description	Cadmium (ug/m^3)	Hexavalent Chromium (ug/m^3)	Copper (ug/m^3)	Lead (ug/m^3)	Manganese (ug/m^3)	Mercury (ug/m^3)	Nickel (ug/m^3)	Selenium (ug/m^3)	Zinc (ug/m^3)
Carcinogenic MEI[1]	2.80E-04	3.14E-05	9.30E-04	1.62E-03	3.90E-04	3.76E-05	8.90E-04	1.00E-04	4.97E-03
Chronic non-carcinogenic MEI[2]	2.60E-04	2.99E-05	8.80E-04	1.54E-03	3.70E-04	3.57E-05	8.50E-04	1.00E-04	4.72E-03
Residence #A[3]	5.00E-05	5.20E-06	1.50E-04	2.70E-04	6.00E-05	6.20E-06	1.50E-04	2.00E-05	8.20E-04
Residence #B[4]	3.00E-05	3.60E-06	1.10E-04	1.90E-04	4.00E-05	4.30E-06	1.00E-04	1.00E-05	5.70E-04
Residence #C[5]	3.00E-05	3.50E-06	1.00E-04	1.80E-04	4.00E-05	4.20E-06	1.00E-04	1.00E-05	5.50E-04
Residence #D[6]	4.00E-05	5.00E-06	1.50E-04	2.60E-04	6.00E-05	6.00E-06	1.40E-04	2.00E-05	7.90E-04
Residence #E[7]	3.00E-05	3.10E-06	9.00E-05	1.60E-04	4.00E-05	3.70E-06	9.00E-05	1.00E-05	5.00E-04
Residence #F[8]	4.00E-05	4.20E-06	1.20E-04	2.10E-04	5.00E-05	5.00E-06	1.20E-04	1.00E-05	6.60E-04
Residence #G[9]	4.00E-05	4.80E-06	1.40E-04	2.50E-04	6.00E-05	5.80E-06	1.40E-04	2.00E-05	7.60E-04
Juvinile Hall[10]	3.00E-05	3.00E-06	9.00E-05	1.50E-04	4.00E-05	3.60E-06	8.00E-05	1.00E-05	4.70E-04
Olive View Hospital[11]	3.00E-05	3.60E-06	1.10E-04	1.90E-04	4.00E-05	4.30E-06	1.00E-04	1.00E-05	5.70E-04

[1] Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
[2] Receptor UTM Coordinates; East (x) 364146 meters, North (y) 3802740 meters.
[3] Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
[4] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
[5] Receptor UTM Coordinates; East (x) 363268 meters, North (y) 3805244 meters.
[6] Receptor UTM Coordinates; East (x) 361610 meters, North (y) 3801854 meters.
[7] Receptor UTM Coordinates; East (x) 362220 meters, North (y) 3799805 meters.
[8] Receptor UTM Coordinates; East (x) 363098 meters, North (y) 3799390 meters.
[9] Receptor UTM Coordinates; East (x) 362585 meters, North (y) 3804878 meters.
[10] Receptor UTM Coordinates; East (x) 363500 meters, North (y) 3798122 meters.
[11] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.

TABLE 17

CARCINOGENIC RISK AT RECEPTORS OF CONCERN
(page 1 of 3)

Receptor Description	Benzene	Carbon Tetrachloride	Chloroform	Ethylene Dichloride	Methylene Chloride	Perchloro-ethylene	Trichloro-ethylene	Vinyl Chloride	Formaldehyde	PAHs
Carcinogenic MEI[1]	8.64E−07	1.09E−08	6.89E−10	1.40E−08	4.16E−09	4.60E−08	9.76E−09	6.90E−07	1.29E−06	5.39E−06
Residence #A[2]	1.39E−07	1.68E−09	1.06E−10	2.20E−09	6.40E−10	7.14E−09	1.50E−09	1.07E−07	2.14E−07	8.84E−07
Residence #B[3]	9.14E−08	8.40E−10	5.30E−11	1.40E−09	4.00E−10	4.43E−09	9.40E−10	6.63E−08	1.48E−07	6.12E−07
Residence #C[4]	9.98E−08	1.26E−09	1.06E−10	1.60E−09	5.00E−10	5.49E−09	1.16E−09	8.27E−08	1.44E−07	5.95E−07
Residence #D[5]	1.62E−07	2.52E−09	1.59E−10	3.00E−09	9.10E−10	1.00E−08	2.12E−09	1.51E−07	2.06E−07	8.50E−07
Residence #E[6]	9.51E−08	1.26E−09	1.06E−10	1.80E−09	5.10E−10	5.61E−09	1.18E−09	8.42E−08	1.29E−07	5.44E−07
Residence #F[7]	1.26E−07	1.68E−09	1.06E−10	2.20E−09	6.60E−10	7.32E−09	1.56E−09	1.10E−07	1.71E−07	7.14E−07
Residence #G[8]	1.35E−07	1.68E−09	1.06E−10	2.20E−09	6.70E−10	7.38E−09	1.56E−09	1.11E−07	1.98E−07	8.16E−07
Juvinile Hall[9]	8.53E−08	1.26E−09	5.30E−11	1.40E−09	4.30E−10	4.72E−09	1.00E−09	7.10E−08	1.23E−07	5.10E−07
Olive View Hospital[10]	9.14E−08	8.40E−10	5.30E−11	1.40E−09	4.00E−10	4.43E−09	9.40E−10	6.63E−08	1.48E−07	6.12E−07

1 Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
2 Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
3 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
4 Receptor UTM Coordinates; East (x) 363268 meters, North (y) 3805244 meters.
5 Receptor UTM Coordinates; East (x) 361610 meters, North (y) 3801854 meters.
6 Receptor UTM Coordinates; East (x) 362220 meters, North (y) 3799805 meters.
7 Receptor UTM Coordinates; East (x) 363098 meters, North (y) 3799390 meters.
8 Receptor UTM Coordinates; East (x) 362585 meters, North (y) 3804878 meters.
9 Receptor UTM Coordinates; East (x) 363500 meters, North (y) 3798122 meters.
10 Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.

TABLE 17

CARCINOGENIC RISK AT RECEPTORS OF CONCERN
(page 2 of 3)

Receptor Description	Napthalene	Acetaldehyde	Acrolein	1,3–Butadiene	Chlorobenzene	Toluene	Xylenes	Hydrogen chloride	Arsenic	Beryllium
Carcinogenic MEI[1]	---	2.23E–07	---	5.95E–08	---	---	---	---	5.28E–07	3.84E–07
Residence #A[2]	---	3.69E–08	---	1.02E–08	---	---	---	---	9.90E–08	7.20E–08
Residence #B[3]	---	2.55E–08	---	6.80E–09	---	---	---	---	6.60E–08	4.80E–08
Residence #C[4]	---	2.49E–08	---	6.80E–09	---	---	---	---	6.60E–08	4.80E–08
Residence #D[5]	---	3.53E–08	---	1.02E–08	---	---	---	---	9.90E–08	7.20E–08
Residence #E[6]	---	2.22E–08	---	6.80E–09	---	---	---	---	6.60E–08	4.80E–08
Residence #F[7]	---	2.96E–08	---	8.50E–09	---	---	---	---	6.60E–08	4.80E–08
Residence #G[8]	---	3.41E–08	---	8.50E–09	---	---	---	---	9.90E–08	7.20E–08
Juvinile Hall[9]	---	2.12E–08	---	5.10E–09	---	---	---	---	6.60E–08	4.80E–08
Olive View Hospital[10]	---	2.55E–08	---	6.80E–09	---	---	---	---	6.60E–08	4.80E–08

[1] Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
[2] Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
[3] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
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[7] Receptor UTM Coordinates; East (x) 363098 meters, North (y) 3799390 meters.
[8] Receptor UTM Coordinates; East (x) 362585 meters, North (y) 3804878 meters.
[9] Receptor UTM Coordinates; East (x) 363500 meters, North (y) 3798122 meters.
[10] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.

TABLE 17

CARCINOGENIC RISK AT RECEPTORS OF CONCERN
(page 3 of 3)

Receptor Description	Cadmium	Hexavalent Chromium	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Zinc	Total
Carcinogenic MEI[1]	1.18E−06	4.40E−06	---	---	---	---	2.31E−07	---	---	1.53E−05 [11]
Residence #A[2]	2.10E−07	7.28E−07	---	---	---	---	3.90E−08	---	---	2.55E−06
Residence #B[3]	1.26E−07	5.04E−07	---	---	---	---	2.60E−08	---	---	1.73E−06
Residence #C[4]	1.26E−07	4.90E−07	---	---	---	---	2.60E−08	---	---	1.72E−06
Residence #D[5]	1.68E−07	7.00E−07	---	---	---	---	3.64E−08	---	---	2.51E−06
Residence #E[6]	1.26E−07	4.34E−07	---	---	---	---	2.34E−08	---	---	1.59E−06
Residence #F[7]	1.68E−07	5.88E−07	---	---	---	---	3.12E−08	---	---	2.07E−06
Residence #G[8]	1.68E−07	6.72E−07	---	---	---	---	3.64E−08	---	---	2.36E−06
Juvinile Hall[9]	1.26E−07	4.20E−07	---	---	---	---	2.08E−08	---	---	1.51E−06
Olive View Hospital[10]	1.26E−07	5.04E−07	---	---	---	---	2.60E−08	---	---	1.73E−06

[1] Receptor UTM Coordinates; East (x) 363049 meters, North (y) 3802744 meters.
[2] Receptor UTM Coordinates; East (x) 363780 meters, North (y) 3799049 meters.
[3] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
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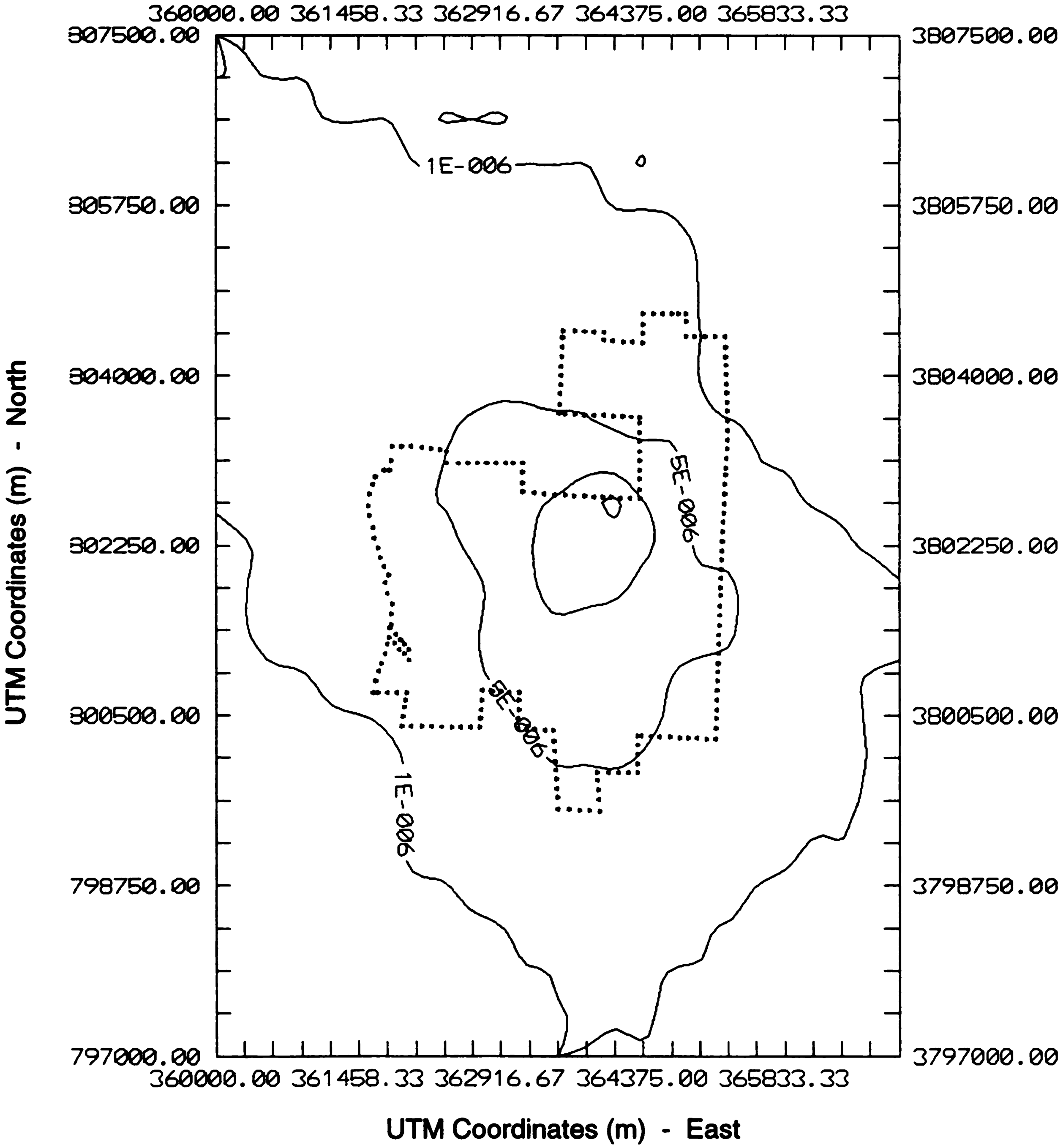
[10] Receptor UTM Coordinates; East (x) 365098 meters, North (y) 3799195 meters.
[11] This receceptor is located at the property boundary directly north of the landfill. It is unlikely that a residence would be located here. Therefore, carcinogenic risk should be calculated assuming an occupational exposure. CAPCOA guidelines suggest an assumption of a 46 year exposure, five days a week, eight hours per day. Using this assumption, a factor of 0.14 should be applied to the carcinogenic risk resulting in a maximum cancer risk of 2.14E−06.

TABLE 18

CARCINOGENIC RISK AT IDENTIFIED RECEPTORS

Receptor	Location from Proposed Facility	UTM Coordinates East (m)	UTM Coordinates North (m)	Carcinogenic Risk
MEI – Occupational	North	364049	3802744	2.14E–06
MEI – Residence #A	South	363780	3799049	2.55E–06
Residence #B	South southeast	365098	3798195	1.73E–06
Residence #C	North	363268	3805244	1.72E–06
Residence #D	West	361610	3801854	2.51E–06
Residence #E	South	362220	3799805	1.59E–06
Residence #F	South	363098	3799390	2.07E–06
Residence #G	Northwest	362585	3804878	2.36E–06
Juvinile Hall	South	363500	3798122	1.51E–06
Olive View Hospital	Southeast	365098	3799195	1.73E–06



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ELSMERE SWMF

Figure E-1

MAXIMUM INDIVIDUAL CANCER RISK IMPACTS

APPENDIX F

CUMULATIVE IMPACT PROJECTS

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APPENDIX F

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT Location	Description	Acres, if applicable
WITHIN THE ANGELES NATIONAL FOREST [1]		
OAK SPRINGS TRAILHEAD CONSTRUCTION T3N, R14W, Section 27	Parking facilities, access road, sanitary facilities, cooking facilities	< 1
PACOIMA PRESCRIBED BURN/VEGETATION MANIPULATION T3N, R12W; T3N, R13,14,15W; T4N, R12,13,14W	Prescribed burn as allowed under Land Management Plan	appx. 8,800
WEST SANTA CLARA FUEL BREAK MAINTENANCE T3N, R14W	Maintenance through hand burning and mechanical treatment	200
CENTRAL SANTA CLARA FUEL BREAK MAINTENANCE T4N, R13W	Maintenance through hand burning and mechanical treatment	200
BIG TUJUNGA MANAGEMENT PLAN T2N, R11W through T4N, R12W	Management Plan for entire Big Tujunga Drainage watershed, including multiple diverse projects for ecosystem management	appx. 2,000
TIMBER STAND IMPROVEMENT T3N, R14W; T4N, R13W	Improvement of timber stand through pruning, thinning	163
WILDLIFE HABITAT INVESTMENT STRUCTURE T4N, R14W	Repair pond in Soledad Canyon for protection of threatened and endangered species habitat	40
WEST END VEGETATIVE MANAGEMENT PROJECT T3N, R15W, Sections 1-5, 8-18, 20, 23, 24	Watershed protection and vegetative age class management over ten years through prescribed burning, mechanical treatment, planting, and thinning	appx. 2,400
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS WEATHER MODIFICATION PROJECT Iron Mountain (one of several stations within the ANF)	Installation of ground generators for cloud seed operations to increase water yield to the Los Angeles Basin	>1 per generator site

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

WITHIN THE UNINCORPORATED AREA OF LOS ANGELES COUNTY [2]			
PROJECT **Location**	**Description**	**Acres**	**Units**
WEST VALLEY CONVEYANCE PROJECT San Fernando Alternative: From Rinaldi/Devonshire area of Granada Hills to North Las Posas Basin in Ventura County Santa Clara River Alternative: From Santa Clarita along river to Las Posas Basin in Ventura County	Joint MWD of Southern California and Calleguas MWD venture; approximately 25 miles of eight-foot diameter water pipeline; tunnel through either Santa Susana or Oak Ridge Mountains; variable right-of-way	N/A	N/A
NORTH RIVER-SANTA FE PROJECT (TRACT 48823) Immediately north of Newhall Ranch Road; approximately three-quarters mile west of Bouquet Canyon Road, near Saugus	Single family attached	41.8	352
PROJECT NUMBER 86312-5 Sunshine Canyon; southwest of intersection of SR 14 and I-5	Landfill extension	542	N/A
PROJECT NUMBERS 87367 AND 86009 Haskell Canyon Road, Bouquet Canyon zone district	Single family, low and moderate income, and open space	118.2	919
PROJECT NUMBER 88422 Copperhill Drive, Bouquet Canyon zone district	Residential planned development	157	374
PROJECT NUMBER 88280 Boxwood Lane and Raintree Lane, Bouquet Canyon zone district	Single family	123	355
PROJECT NUMBER 081 (BEN JOHNSON'S FARMS) Bouquet and Vasquez Canyons, Bouquet Canyon zone district	UNK	1077	300
PROJECT NUMBER 88298 Vasquez Canyon Road, Bouquet Canyon zone district	Single family	93.2	292
PROJECT NUMBER 88082 Haskell Canyon Road, Bouquet Canyon zone district	Single family and commercial	223 SF; UNK C	63
PROJECT NUMBER 86441 South of Vasquez Canyon Road, west of Sierra Highway; Bouquet Canyon zone district	Single family and open space	360.3	205
PROJECT NUMBER 88044 Copperhill Drive and Haskell Canyon Road; Bouquet Canyon zone district	Single family	74	177

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 89130 North of Copperhill Road; Bouquet Canyon zone district	Single family and open space	86	177
PROJECT NUMBER 90210 Far Hills Road, Bouquet Canyon zone district	Single family	153.9	78
PROJECT NUMBER 88286 Hayfork Road, Bouquet Canyon zone district	Single family	41.4	38
PROJECT NUMBER 88596 Seco Canyon Road; Bouquet Canyon zone district	Residential planned development	205	317
PROJECT NUMBER 89394 110th Street West and Johnson Road South; Bouquet Canyon zone district	Residential planned development	78.4	UNK
PROJECT NUMBER 94021 North of Copperhill Drive; Bouquet Canyon zone district	Single family lots/hillside	79	194
PROJECT NUMBER 92074 West of San Francisquito Canyon Road, Castaic Canyon zone district	Single family	1738	3000
PROJECT NUMBER 85340 (LARWIN PROJECT) Old Road, Castaic Canyon zone district	Single family	213	1400
PROJECT NUMBER 89140 South of Newhall Ranch Road, Castaic Canyon zone district	Commercial and residential planned development	254.8	502
PROJECT NUMBER 86201 Lake Hughes Road and Old Ridge Route, Castaic Canyon zone district	Single family, condos, and multifamily	76.3	493
PROJECT NUMBER 86365 Northwest of Old Road and Backer Road, Castaic Canyon zone district	Single family, open space, and commercial	189	402
PROJECT NUMBER 86255 East of Sloan Canyon Road and Madloy Street, Castaic Canyon zone district	Single family	161.8	376
PROJECT NUMBER 87465 Newhall Ranch Road, Castaic Canyon zone district	Residential planned development and condos	44.9	352
PROJECT NUMBER 88027 West of Backer and north of Halsey Canyon Roads, Castaic Canyon zone district	Single family and open space	150.4	298

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 87539 Old Road, Castaic Canyon zone district	Single family and open space	400	297
PROJECT NUMBER 321 Camino del Valle, west of I-5, Castaic Canyon zone district	Single family and residential planned development	194.8	289
PROJECT NUMBER 88597 Newhall Ranch Road. Castaic Canyon zone district	Multifamily, open space, and residential planned development	36.2	288
PROJECT NUMBER 242 Lake Hughes Road, Castaic Canyon zone district	Single family, clustered	720	238
PROJECT NUMBER 89158 Sloan Canyon Road, Castaic Canyon zone district	Residential	133	233
PROJECT NUMBER 89153 South of Parker Road and Camino del Valle, Castaic Canyon zone district	Residential	129	226
PROJECT NUMBER 87178 West side Bouquet Canyon Road, Castaic Canyon zone district	Residential planned development and multifamily	12.6	192
PROJECT NUMBER 87331 Halsey Canyon and del Valle Roads, Castaic Canyon zone district	Mobile homes	123.3	184
PROJECT NUMBER 89293 Park Forest Road, Castaic Canyon zone district	UNK	78	167
PROJECT NUMBER 87287 North of Halsey Canyon and del Valle Roads, Castaic Canyon zone district	Single family	140	165
PROJECT NUMBER 88455 31657 Old Ridge Route, Castaic Canyon zone district	Apartments	3.4	93
PROJECT NUMBER 87303 Halsey Canyon Road, Castaic Canyon zone district	Single family	160	80
PROJECT NUMBER 89191 Sloan Canyon and Halsey Canyon Roads, Castaic Canyon zone district	Mobile home, community commercial, and open space	70.4	80
PROJECT NUMBER 89213 Romero Canyon Road, Castaic Canyon zone district	Single family	199.1	79

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 88556 27744 Parker Road, Castaic Canyon zone district	Multifamily and condos	5.4	76
PROJECT NUMBER 89259 Halsey Canyon Road, Castaic Canyon zone district	Single family	80	75
PROJECT NUMBER 91145 West side of I-5, Castaic Canyon zone district	Single family and open space	39.9	72
PROJECT NUMBER 87318 West of Halsey Canyon Road, Castaic Canyon zone district	UNK	139.5	61
PROJECT NUMBER 91201 West of Park Forest Road and Yosemite Drive, Castaic Canyon zone district	Single family	9.6	57
PROJECT NUMBER 86274 Old Ridge Route, Castaic Canyon zone district	Multifamily	1.3	33
PROJECT NUMBER 88524 North side Avenue D, Castaic Canyon zone district	Single family	155	30
PROJECT NUMBER 87015 Park Forest Road, Castaic Canyon zone district	Single family	5	21
PROJECT NUMBER 88309 West of Meadow Grass and Evergreen Lanes, Castaic Canyon zone district	Single family	9.4	19
PROJECT NUMBER 90225 28880 Sloan Canyon Road, Castaic Canyon zone district	Single family	30	18
PROJECT NUMBER 91317 Vaca Road, Castaic Canyon zone district	Single family	5	18
PROJECT NUMBER 87016 Green Hill Drive, Castaic Canyon zone district	Single family	263.9	14
PROJECT NUMBER 90048 South of Lancaster Road, Castaic Canyon zone district	Single family	239.2	12
PROJECT NUMBER 85608 30769 San Francisquito Canyon Road, Castaic Canyon zone district	Trap and skeet range, trailer, and club house	40	2

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 89085 Sloan Canyon Road, Castaic Canyon zone district	Senior citizen residence	40	UNK
PROJECT NUMBER 86134 31558 Castaic Road, Castaic Canyon zone district	Motel	2.7	142
PROJECT NUMBER 86239 Parker Road, Castaic Canyon zone district	Motel	0.8	50
PROJECT NUMBER 86484 Halsey Canyon Road, Castaic Canyon zone district	Industrial	49	16+
PROJECT NUMBER 87049 30459 Old Road, Castaic Canyon zone district	Industrial: trucking company offices, repair, storage, parking, and miscellaneous	3.9	UNK
PROJECT NUMBER 87150 Route 126, Castaic Canyon zone district	Industrial	31.4	12+
PROJECT NUMBER 87563 31333 Castaic Road, Castaic Canyon zone district	Truck stop and motel	5.4	UNK
PROJECT NUMBER 88073 East of I-5, Castaic Canyon zone district	Industrial buildings, gas station, and restaurant	297	29+
PROJECT NUMBER 89098 27353 San Martinez Canyon Road, Castaic Canyon zone district	Concrete mixing and batch plant	5	UNK
PROJECT NUMBER 89072 Old Road, Castaic Canyon zone district	Shopping center	10.9	UNK
PROJECT NUMBER 89484 31544 Castaic Road, Castaic Canyon zone district	Hotel development	1.9	UNK
PROJECT NUMBER 91070 32300 Old Ridge Route, Castaic Canyon zone district	Reclamation plant	100	UNK
PROJECT NUMBER 91290 Backer and Halsey Canyon Roads, Castaic Canyon zone district	Industrial	41.9	6+
PROJECT NUMBER 92243 Pine Canyon and Tweedy Lane Roads, Castaic Canyon zone district	Trailer park and camp ground	29	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 89345 Hasty Canyon Road off Old Road; Castaic Canyon Zone District	Residential planned development	36.9	71
PROJECT NUMBER 93081 East side of I-5, west of Castaic Creek; Castaic Canyon Zone District	Golf course, driving range and clubhouse	180	UNK
PROJECT NUMBER 94059 East of Interstate 5, east of Ridge Route Road; Castaic Canyon Zone District	Single and multifamily lots	520	UNK
PROJECT NUMBER 85024 Simi Freeway (118) and Topanga Canyon, Chatsworth zone district	Condos and town homes	UNK	570
PROJECT NUMBER 88072 South of Woolsey Canyon Road, Chatsworth zone district	Mobile homes	83	242
PROJECT NUMBER 150 Kittridge and Randiwood Lanes, Chatsworth zone district	Town homes and single family	58	46 MF; 68 SF
PROJECT NUMBER 90188 Randiwood and Welby Lanes, Chatsworth zone district	Single family	58	114
PROJECT NUMBER 86070 North west of Taima Avenue and Quilla Drive, Chatsworth zone district	Single family	338	72
PROJECT NUMBER 90100 North of Simi Freeway (118), Chatsworth zone district	Single family	53.2	63
PROJECT NUMBER 89348 Browns Canyon Road, Chatsworth zone district	Single family	160	30
PROJECT NUMBER 89387 North of Simi Freeway (118), Chatsworth zone district	Condos	2.8	19
PROJECT NUMBER 85395 Simi Freeway and Topanga Canyon Road, Chatsworth zone district	Office, retail, restaurant	UNK	UNK
PROJECT NUMBER 85622 Simi Freeway and Topanga Canyon Boulevard, Chatsworth zone district	Church	13.3	UNK
PROJECT NUMBER 87225 21523 San Fernando Mission Road, Chatsworth zone district	Youth camp and recreation club	7	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 88153 24303 Woolsey Canyon Road, Chatsworth zone district	Mobile homes	38.7	UNK
PROJECT NUMBER 93184 Woolsey Canyon Road; Chatsworth zone district	Mobile home park, condo conversion	38	UNK
PROJECT NUMBER 89113 Anthony Road, Mount Gleason zone district	Single family	230	42
PROJECT NUMBER 90410 12651 Little Tujunga Canyon Road, Mount Gleason zone district	Public shooting range	95	UNK
PROJECT NUMBER 93097 16000 Bailey Road; Mount Gleason zone district	Recovery camp	20	UNK
PROJECT NUMBER 87335 Pico Canyon Boulevard, Newhall zone district	Single family and other (unk)	3057.3	4378
PROJECT NUMBER 87222 West of Old Road, Newhall zone district	Single family, multifamily, open space, and recreation	757	1940
PROJECT NUMBER 85359 North east of Newhall Ranch Road and McBean Parkway extension, Newhall zone district	Single family, open space, park/recreation, and school	610	1801
PROJECT NUMBER 88362 North of Seco Canyon and Bouquet Canyon Roads, Newhall zone district	Single family	491	1665
PROJECT NUMBER 86257 West of Hemingway Avenue, Newhall zone district	Single family and residential planned development	690.7	1603
PROJECT NUMBER 92247 North of Copperhill Drive, Newhall zone district	Single family, park, school, fire station, other (unk)	743.3	1544
PROJECT NUMBER 177 Seco Canyon and Tupelo Ridge Roads, Newhall zone district	Single family, apartments, and residential planned development	491	1516
PROJECT NUMBER 88321 McBean Parkway extension, Newhall zone district	Single family, open space, commercial, multifamily, public facilities	361	1348
PROJECT NUMBER 89100 North of Magic Mountain Parkway, Newhall zone district	Commercial and residential planned development	81.1	1215

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 89436 West of I-5, Newhall zone district	Single family, condos, open space, commercial	860	1162
PROJECT NUMBER 88139 East of San Fernando Road and Antelope Valley Freeway, Newhall zone district	Single family, multifamily, open space, and commercial	527.2	1087
PROJECT NUMBER 205 Pico Canyon and Old Roads, Newhall zone district	Residential	132.2	936
PROJECT NUMBER 173 West of I-5 and north of Pico Canyon Road, Newhall zone district	Single family, condos, commercial, park, and open space	3057.3	882
PROJECT NUMBER 85388 West of I-5 and southwest of Pico Canyon Road, Newhall zone district	Multifamily (condos)	35	510
PROJECT NUMBER 153 Bouquet and Haskell Canyons, Newhall zone district	Single family	118	430
PROJECT NUMBER 86491 McBean Parkway extension, Newhall zone district	Duplexes	111	420
PROJECT NUMBER 89107 Copperhill Drive, Newhall zone district	Single family and commercial	143	380 SF; C UNK
PROJECT NUMBER 116 I-5 and Halsey Canyon Road, Newhall zone district	Residential planned development	143	359
PROJECT NUMBER 85007 West of I-5, south of Pico Canyon Road, Newhall zone district	Single family	258.3	337
PROJECT NUMBER 86466 West of I-5, east of Lyons Road, Newhall zone district	Single family, open space, and commercial	213	240
PROJECT NUMBER 110 Halsey Canyon and Old Roads, Newhall zone district	Single family, park, and water site	37.7	195
PROJECT NUMBER 86151 McBean Parkway and Hemingway Avenue, Newhall zone district	Condos	20.1	192
PROJECT NUMBER 87262 South of Newhall Ranch Road, Newhall zone district	Multifamily	20.5	180

PROJECT NUMBER 87494 Copperhill Drive and Seco Canyon Road, Newhall zone district	residential planned development	11.5	136
PROJECT NUMBER 88533 At Sagecrest Circle, Newhall zone district	Single family	67	108
PROJECT NUMBER 85360 24305 Lyons Avenue, Newhall zone district	Adult residential facility	UNK	90
PROJECT NUMBER 86179 Faulkner Avenue and Stanford Court, Newhall zone district	Single family	14.1	88
PROJECT NUMBER 85005 Halsey Canyon Road and Camino del Valle, Newhall zone district	Mobile homes	22.5	80
PROJECT NUMBER 86178 McBean Parkway and Stafford Court, Newhall zone district	Single family	14.8	75
PROJECT NUMBER 89445 South o f Pico Canyon Road, e\west of McBean Parkway and Old Road, Newhall zone district	Condos	22.6	69
PROJECT NUMBER 91086 22400 Old Road, Newhall zone district	Single family	157	68
PROJECT NUMBER 89393 Pico Canyon Road, Newhall zone district	Condos	20.1	59
PROJECT NUMBER 86182 Faulkner and Wilde Avenues, Newhall zone district	Single family and open space	5.7	45
PROJECT NUMBER 86177 Faulkner Avenue and Stafford Court, Newhall zone district	Condos and open space	6.9	42
PROJECT NUMBER 90010 Jackson and Monroe Streets, Newhall zone district	Single family	80	33
PROJECT NUMBER 90520 Gilmour Road, Newhall zone district	Single family	120	21
PROJECT NUMBER 88370 South of SR 126, Newhall zone district	Single family	9925	20

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 90196 Halsey Canyon Road, Newhall zone district	Single family	40.2	18
PROJECT NUMBER 85595 South of Rye Canyon Road and Scott Avenue, Newhall zone district	Industrial	47.2	18+
PROJECT NUMBER 86294 South of Pico Canyon and Old Roads, Newhall zone district	Hotel, restaurants, offices	17	UNK
PROJECT NUMBER 87239 Old Road, Newhall zone district	Commercial	15.8	14+
PROJECT NUMBER 87561 Magic Mountain Parkway, Newhall zone district	Commercial	27.1	10+
PROJECT NUMBER 88163 Tibbetts Avenue, Newhall zone district	Industrial	23.3	9+
PROJECT NUMBER 88223 East of Old Road, Newhall zone district	Hotel	5.4	UNK
PROJECT NUMBER 88312 23747 Old Road, Newhall zone district	Motion picture studio	10	UNK
PROJECT NUMBER 88320 Newhall Ranch Road, Newhall zone district	Commercial, industrial, and public facility	194	2+
PROJECT NUMBER 88376 West of I-5, Newhall zone district	Public golf course	195	UNK
PROJECT NUMBER 88587 Pico Canyon and Old Roads, Newhall zone district	Commercial	20.1	1+
PROJECT NUMBER 88595 22400 Old Road, Newhall zone district	Open storage for RVs	54	unk
PROJECT NUMBER 89081 29201 Henry Mayo Drive, Newhall zone district	Reclaim sanitary landfill	509	0
PROJECT NUMBER 89174 Commerce Center Drive, Newhall zone district	Industrial	134	24+

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 90189 Tibbetts Avenue, Newhall zone district	Industrial and open space	14.6	9+
PROJECT NUMBER 90352 Coltrane Avenue, Newhall zone district	Trailer park	95.6	UNK
PROJECT NUMBER 90445 South of Halsey Canyon Road, Newhall zone district	Single family and industrial	197	1 SF; 3+ I
PROJECT NUMBER 91106 Copperhill Drive, Newhall zone district	Church	24.4	1+
PROJECT NUMBER 92121 Magic Mountain Parkway, Newhall zone district	Multifamily (condos), commercial and open space	63.3	1215
PROJECT NUMBER 92153 22400 Old Road, Newhall zone district	Radio communication facilities	54	UNK
PROJECT NUMBER 92258 23110 Old Road, Newhall zone district	Equipment shelter, 106-foot steel monopole with antenna	141	1+
PROJECT NUMBER 88151 North of the Future McBean Parkway and Decoro Drive Intersection; Newhall zone district	Residential planned development	86.6	406
PROJECT NUMBER 87437 North of Magic Mountain Parkway, west of Seco Canyon Road; Newhall zone district	Residential planned development	2,730	44
PROJECT NUMBER 92014 Newhall Ranch Road and Bouquet Canyon Road; Newhall zone district	Residential planned development	20	UNK
PROJECT NUMBER 93156 25100 Rye Canyon Road; Newhall zone district	Subdivision to create 3 parcels	200	UNK
PROJECT NUMBER 93179 West of McBean Parkway between Decoro Drive and Copperhill Drive; Newhall zone district	Condos and single family residential planned development	99.9	UNK
PROJECT NUMBER 94087 SR 126, west of I-5, south to Santa Susanas, west to Ventura County lines; Newhall zone district	Residential and commercial planned development	11,958	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 85191 Sierra Highway and Antelope Valley Freeway, Sand Canyon zone district	Residential and other (unk)	988	5400
PROJECT NUMBER 85628 Plum Canyon Road extension, Sand Canyon zone district	Residential, shopping center, park, and fire station	603	2500+
PROJECT NUMBER 86343 West of Sand Canyon Road, between SR 14 and ANF, Sand Canyon zone district	Specific plan	1296	2131
PROJECT NUMBER 86237 Plum Canyon Road, Sand Canyon zone district	L.A County and Santa Clarita Valley Plan amendments	210	879
PROJECT NUMBER 86522 East of SR 14, west of Woodfall Road, south of Santa Clara River, Sand Canyon zone district	Multifamily	46.2	800
PROJECT NUMBER 287 Sierra Highway, Sand Canyon zone district	Condos	38.9	776
PROJECT NUMBER 86189 Plum Canyon Road, Sand Canyon zone district	Single family, multifamily, open space, public facility, and recreation	277.5	702
PROJECT NUMBER 89094 South of SR 14 and Via Princessa, Sand Canyon zone district	Single family, duplexes, multifamily, public facilities, and commercial	165	695
PROJECT NUMBER 87259 East of Sierra Highway, north of SR 14, south of the Santa Clara River, Sand Canyon zone district	Multifamily and open space	29.3	646
PROJECT NUMBER 87053 East of Sierra Highway, north of SR 14, south of the Santa Clara River, Sand Canyon zone district	Multifamily (clustered)	31.9	552
PROJECT NUMBER 87187 East of Sierra Highway, west of SR 14, south of the Santa Clara River, Sand Canyon zone district	Multifamily and open space	31.1	544
PROJECT NUMBER 86524 Bouquet Canyon and Vasquez Canyon Roads, Sand Canyon zone district	Single family, open space, and commercial	204	510

PROJECT NUMBER 87343 East of Sierra Highway, west of SR 14, south of the Santa Clara River, Sand Canyon zone district	Duplexes, multifamily, and commercial	27.8	464
PROJECT NUMBER 160 Soledad Canyon and San Canyon Roads, Sand Canyon zone district	Multifamily (condos), recreation	88.5	392
PROJECT NUMBER 85357 East of Sierra Highway, south of Via Princessa, Sand Canyon zone district	Multifamily and shopping center	19.4	362
PROJECT NUMBER 354 Bouquet Canyon Road, Sand Canyon zone district	Single family	89.6	283
PROJECT NUMBER 85209 Bouquet and Plum Canyons, Sand Canyon zone district	Single family, open space, and public facilities	179	241
PROJECT NUMBER 90002 Sierra Highway, Sand Canyon zone district	Single family	245.9	174
PROJECT NUMBER 90516 Vasquez Canyon Road, Sand Canyon zone district	Single family and open space	478.9	172
PROJECT NUMBER 89469 South of Santa Clara River, east of Sierra Highway, north of SR 14, Sand Canyon zone district	Multifamily (condos)	9.5	167
PROJECT NUMBER 182 Oak Springs Road and Circle G Drive, Sand Canyon zone district	Single family	345.5	136
PROJECT NUMBER 214 Oak Springs and Soledad Canyon Roads, Sand Canyon zone district	Multifamily (condos) and open space	20	120
PROJECT NUMBER 90264 Sierra Highway, Sand Canyon zone district	Multifamily (condos) and recreation	65	115
PROJECT NUMBER 89418 16274 Vasquez Canyon Road, Sand Canyon zone district	Mobile homes	13.8	101
PROJECT NUMBER 92235 Bledsoe Street, Sand Canyon zone district	Single family	245.6	97

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Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 90001 East of Vasquez Canyon Road, Sand Canyon zone district	Single family	55	84
PROJECT NUMBER 86259 16164 Sierra Highway, Sand Canyon zone district	Residential planned development, possibly low- and moderate-income	9.9	80
PROJECT NUMBER 88569 Sierra Highway, Sand Canyon zone district	Single family	65	75
PROJECT NUMBER 89493 Near Sierra Highway and Vasquez Canyon Road, Sand Canyon zone district	Single family	80	60
PROJECT NUMBER 90081 East of San Canyon and Lost Canyon Roads, south of Sr 14, Sand Canyon zone district	Single family	88.1	45
PROJECT NUMBER 87036 Vasquez Canyon Road, Sand Canyon zone district	Single family	86.2	43
PROJECT NUMBER 88342 Sierra Highway, Sand Canyon zone district	Single family	40	34
PROJECT NUMBER 85299 North of Wisteria Valley Road, East of San Canyon, Sand Canyon zone district	Single family	40	26
PROJECT NUMBER 91023 Wisteria Valley Road, Sand Canyon zone district	Single family	40	22
PROJECT NUMBER 87508 North of Caraway Lane, Sand Canyon zone district	Single family	40	20
PROJECT NUMBER 90433 Running Horse Road, Sand Canyon zone district	Single family and open space	93.4	14
PROJECT NUMBER 89189 Santa Clara River bed south of SR 14, east of Woodfall	Surface mining	32	UNK
PROJECT NUMBER 90528 North of Paxton Street, Sand Canyon zone district	Grading and equipment storage	42	UNK

PROJECT NUMBER 91077 15604 Norland Drive, Sand Canyon zone district	Industrial and manufacturing planned development	21.2	15+
PROJECT NUMBER 91110 South of Lost Canyon Road and Sr 14, Sand Canyon zone district	Industrial	14	4+
PROJECT NUMBER 91149 18181 Lost Creek Road, San Canyon zone district	Stables and boarding, caretaker facilities	15.3	UNK
PROJECT NUMBER 89017 North of Shadow Pines Boulevard, Soledad zone district	Single family	427	800
PROJECT NUMBER 90501 East of Agua Dulce Canyon Road, Soledad zone district	Single family and public facilities	1160	696
PROJECT NUMBER 357 East of Shadow Pines Boulevard, Soledad zone district	Single family, open space, and commercial	419	644
PROJECT NUMBER 87549 Soledad Canyon, Soledad zone district	Residential, possibly other (unk)	424.5	637
PROJECT NUMBER 87470 North of Valley Canyon Road and SR 14, Soledad zone district	Residential, possibly other (unk)	331.8	513
PROJECT NUMBER 410 Valley Canyon Road, Soledad zone district	Single family	340	115
PROJECT NUMBER 85207 Southeast of SR 14, north of Soledad Canyon, west of Agua Dulce, Soledad zone district	Single family and multifamily	178.5	403
PROJECT NUMBER 91053 Valley Sage Road, Soledad zone district	Single family and open space	908	372
PROJECT NUMBER 91252 Sierra Highway, Soledad zone district	Single family, multifamily (condos), and open space	510	360
PROJECT NUMBER 90115 13500 Valley Canyon Road, Soledad zone district	Single family and open space	202.3	243
PROJECT NUMBER 307 15112 Sierra Highway, Soledad zone district	Single family	148	126

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 86258 Jasmine Valley Drive and Snow Drop Court, Soledad zone district	Single family, open space, and public facility	43.1	70
PROJECT NUMBER 86153 Sierra Highway, Soledad zone district	Single family	168	61
PROJECT NUMBER 90158 Young Canyon, Soledad zone district	Single family	590	59
PROJECT NUMBER 90370 3927 Sierra Highway, Soledad zone district	Multifamily (condos) and commercial	4.3	48
PROJECT NUMBER 89589 Briarglen and Cedarcroft Roads, Soledad zone district	Single family	110	38
PROJECT NUMBER 88353 East of 42nd Street, west of Acklins, south of Banson, Soledad zone district	Single family	20	30
PROJECT NUMBER 91057 East of Big Springs Road, Soledad zone district	Single family	312	30
PROJECT NUMBER 85120 West of Agua Dulce, north of SR 14, Soledad zone district	Single family	160	16
PROJECT NUMBER 91804 South of Escondido Canyon Road, Soledad zone district	Single family	155	14
PROJECT NUMBER 85610 14212 Lang Station Road, Soledad zone district	Surface mining	93.3	UNK
PROJECT NUMBER 86096 9316 Soledad Canyon Road, Soledad zone district	Religious retreat	21.5	UNK
PROJECT NUMBER 86357 14320 Soledad Canyon Road, Soledad zone district	Surface mining	180	UNK
PROJECT NUMBER 86432 Valley Sage Road, Soledad zone district	Mobile relay building, 100-foot pole	12.4	1+
PROJECT NUMBER 86541 34348 Agua Dulce Canyon Road, Soledad zone district	Plant nursery and sales	7.2	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PROJECT NUMBER 89555 13200 Soledad Canyon Road, Soledad zone district	Surface mining	76	UNK
PROJECT NUMBER 89597 South of Sierra Highway, east of Agua Dulce Road, Soledad zone district	Waste water reclamation plant	UNK	UNK
PROJECT NUMBER 90016 ANF, south of Land Station, Soledad zone district	Surface Mining	13,580	UNK
PROJECT NUMBER 90381 8235 Soledad Canyon Road, Soledad zone district	RV park	22.5	UNK
PROJECT NUMBER 91165 12101 Soledad Canyon Road, Soledad zone district	Surface mining and batch plant	500	UNK
PROJECT NUMBER 91307 Agua Dulce Canyon Road, Soledad zone district	Surface mining	1183	UNK
PROJECT NUMBER 92154 Agua Dulce Canyon Road and SR 14, Soledad zone district	Radio communication facilities	40	UNK
PROJECT NUMBER 92256 Agua Dulce Canyon Road and SR 14, Soledad zone district	Radio equipment shelter and 100-foot steel monopole	20	1+
PROJECT NUMBER 93147 Soledad Canyon Road between SR 14 and Landgard Road; Soledad zone district	Mobile home park	501	981
PROJECT NUMBER 93145 32590 Agua Dulce Canyon Road; Soledad zone district	Residential and other	12	57
PROJECT NUMBER 92072 10111 Escondido Canyon Road; Soledad zone district	Mobile home park	5.7	15
PROJECT NUMBER 93066 Kobe Road and Agua Dulce Canyon Road; Soledad zone district	Single family residential	20	4
PROJECT NUMBER 93076 8237 Soledad Canyon Road; Soledad zone district	Campground	51	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

WITHIN THE CITY LIMITS OF LOS ANGELES [9]			
PROJECT **Location**	**Description**	**Acres**	**Units**
DWP ELECTRIC WORKER TRAINING FACILITY Intersection of San Fernando Road and I-5, Sylmar	Employee training center, including one two-story, 45,000 ft^2 building; 10-acre training yard; 150 parking spaces	40	1
DWP SERVICE CENTER 8901 Canoga Avenue, Canoga Park	Customer service and vehicle maintenance facility, including four buildings totalling 75,000 square feet; 66,000 ft^2, 240 space parking structure	7.7	5
DWP RINALDI-NORTHRIDGE TRANSMISSION LINE From Rinaldi Avenue/I-405 to Receiving Station J, Parthenia Street, Northridge	Single circuit, 230 kV transmission line in existing utility corridor	N/A	N/A
DWP SEPULVEDA BASIN PHASE II IMPROVEMENTS Within limits of the Sepulveda Basin	6,750 linear foot extension of reclaimed eight-, 12-, and 16-inch water line within an eight-foot permanent right-of-way	appx. 1.5	N/A
EAST VALLEY WATER RECLAMATION PROJECT From Sepulveda Basin to Tujunga Spreading Grounds - specific route currently unknown	Approximately 67,800 linear feet of 36- and 54-inch pipeline within an eight-foot permanent right-of-way, two pump stations, and a storage tank for recharge, industrial, and irrigation purposes	appx. 20	N/A
LOS ANGELES POLICE DEPARTMENT DRIVER TRAINING FACILITY In the San Fernando Valley (location to be determined)	Administration/classroom building; vehicle maintenance garage; forklift training area; parking lots; vehicle storage building; underground utilities training vault; and, paved driving skills network	UNK	3+
PROMENADE MALL EXPANSION 6100 Topanga Canyon Boulevard in Woodland Hills	585,000 ft^2 retail addition; 1.8 million ft^2 office in thee 26-story buildings; parking for 7,370 vehicles; demolition of 85,00 ft^2 retail and 8,900 ft^2 restaurant	34.1	4+
PARK SQUARE/WARNER CENTER 21555 Oxnard Street in Woodland Hills	Addition of 2.32 million ft^2 office space; 84,000 ft^2 of site-serving retail; 20,00 ft^2 of community facilities; three parking structures for 8,000 vehicles	32	UNK
VALLEY SAGE PARTNERS DEVELOPMENT Off Shady Lane Road north of Route 14 near Agua Dulce	Subdivision of bare land into low density single family detached residential, open space, water storage (three tanks) and a local	908	372

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

AMESTOY AVENUE STORM DRAIN Parthenia Street to Dearborn Street, near Northridge	Construction of a storm drain system within existing right-of-way for flood control	None	N/A
BALBOA BOULEVARD BRIDGE (EAST AND WEST ROADWAY) Across the Los Angeles River in the Sepulveda Dam area	Widen bridge from 24 (east) or 28 (west) to 40 feet to add sidewalk and bikeway within existing right-of-way	None	N/A
BALBOA BOULEVARD AND VAN OWEN STREET STORM DRAIN Near the Van Nuys Airport in Van Nuys	Construct storm drains and five catch basins; discharge to Bull Creek Channel; within existing right-of-way	None	N/A
BLEDSOE STREET San Fernando Road to Encinitas Avenue in San Fernando	Widen and construct curb, gutter sidewalks, landscaping, lighting, signals, and drainage facilities	UNK	N/A
BURBANK BOULEVARD Near Cahuenga Boulevard in North Hollywood	Widen from 50 to 80 feet; construct catch basins, house connection sewers, concrete curb and gutter, and sidewalks; install street lights and signals	UNK	N/A
CHANDLER BOULEVARD (NORTH AND SOUTH COUPLETS) Coldwater Canyon to Fulton Avenue; Whitsett to Coldwater Canyon Avenue in North Hollywood/Valley Village	Reconstruct and install concrete curb and gutter; remove excess crown; within existing right-of-way	None	N/A
CORBIN AVENUE 850 feet south of Wells Avenue to Rosita Avenue in Tarzana/Woodland Hills area	Widen from 20 to 30 feet; construct concrete curb and gutter, sidewalk, and retaining wall	UNK	N/A
DE SOTO AVENUE BRIDGE Over the Los Angeles River in Canoga Park	Widen from 50 to 80 feet; construct concrete curb and gutter, sidewalk, structure; install street lighting; within existing right-of-way	None	N/A
GREEN BUSH AVENUE AND ERWIN STREET STORM DRAIN From Oxnard to Erwin Street in Van Nuys	Construct storm drain, including underground RCP and catch basins in existing right-of-way	None	N/A
MAGNOLIA BOULEVARD Hollywood Freeway to Colfax Avenue in Valley Village	Widen from 50 to a minimum of 66 feet; construct concrete curb, gutter and sidewalk; install street lighting and traffic signals; within existing right-of-way	None	N/A
MOORPARK STREET AND SUNNYSLOPE AVENUE STORM DRAIN From Sunnyslope Avenue to the Los Angeles River in Sherman Oaks	Construct underground storm drain in existing right-of-way to discharge to the LA River	None	N/A
PETIT AVENUE AND LA MAIDA STREET STORM DRAIN LA County Flood Control Facility at Magnolia Boulevard to La Maida; Petit to South of Moorpark Street in Encino	Construct storm drain system and subdrain system in existing right-of-way	None	N/A

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

RESEDA BOULEVARD BRIDGE Over Los Angeles River north of Victory Boulevard in Reseda	Widen from 50 to 74 feet; construct reinforced concrete bridge additions, concrete curb and gutter, and sidewalk	UNK	N/A
VINELAND AVENUE AND MAGNOLIA BOULEVARD STORM DRAIN From Hesby Street to Magnolia Boulevard in North Hollywood	950 linear feet of storm drain system as a portion of a ten-year area drainage program; within existing right-of-way	None	N/A
WOODLAKE AVENUE STORM DRAIN Cohasset to Ingomar Street in Canoga Park	Construct storm drain system, including underground pipelines and culverts within existing right-of-way	None	N/A
LAURAL PLAZA RENOVATION/EXPANSION Laurel Canyon Boulevard, between Oxnard and Erwin Streets	Addition of 480,000 ft² retail in three department stores	UNK	3
WITHIN THE CITY LIMITS OF SAN FERNANDO [4]			
PROJECT **Location**	**Description**	**Acres**	**Units**
UNNAMED 1932 First Street	5,241 ft² industrial building	0.2	1
WITHIN THE CITY LIMITS OF SANTA CLARITA [5]			
PROJECT **Location**	**Description**	**Acres**	**Units**
PORTA BELLA South of Soledad Canyon Road, west of Redview Drive	Mixed use residential/commercial development	996	3,238
NORTH HILLS Intersection of Valencia Boulevard and Tournament Road	Mixed residential development	200	2,000
VALLEY GATEWAY PROJECT (TRACT 51044) Between Sierra Highway and Remsen	Mixed Commercial(one million ft²)/Multi-family development	UNK	15 MF
TRACT 46473 North of Fambrough Street	Single family detached	UNK	98
TRACT 47691 Greencrest Drive	Single family detached	UNK	114
TRACT 34582 Wildwood Canyon Road	Single family detached	UNK	27

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PP 89-091 City of Santa Clarita Planning Area I	31,000 ft^2 Industrial	UNK	UNK
CUP 90-026 Sierra Highway north of Remsen	167, 000 ft^2 Church	UNK	UNK
TRACT 46473 North of Fambrough Street	Single family detached	UNK	46
PP 92-001 Apple Street at Oakrun Lane	Multi-family addition	UNK	11
PP 92-018 Valley Street at Lyons Avenue	6,000 ft^2 Church addition; conference center and kindergarten	UNK	UNK
PARCEL 16051 NW quad Tourney Road and Valencia Boulevard	Division of commercial property	UNK	6 parcels
PARCEL 16050 Tourney Road north of Valencia Boulevard	Division of commercial property	UNK	4 parcels
TRACT 44374 Valencia Boulevard north of Rockwell Canyon Road	Mixed residential - Single family detached and Multi-family	UNK	314 SF 706 MF
TRACT 33746 Southeast quad Valencia Boulevard and Mc Bean Parkway	Division of commercial property	UNK	11 lots
PP 90-072 Tourney Road east of I-5	102,000 ft^2 six-story office building	UNK	UNK
PARCEL 22540 Anza Drive west of Hopkins Avenue	32,000 ft^2 Industrial	UNK	UNK
PP 90-075 Rye Canyon Road east of Crocker Avenue	46,000 ft^2 Industrial	UNK	UNK
PP 90-117 Stanford Avenue	30,000 ft^2 Industrial	UNK	UNK
PP 90-100 Stanford Avenue east of Scott Avenue	59,000 ft^2 Industrial	UNK	UNK

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PP 89-004 Stanford Avenue east of I-5	17,000 ft^2 Industrial	UNK	UNK
PP 89-11 Stanford Avenue east of I-5	48,000 ft^2 Industrial	UNK	UNK
PP 89-094 Del Monte Avenue	40,000 ft^2 Commercial	UNK	UNK
PP 90-082 Southeast quad Stanford Avenue and Rye Canyon Road	32,000 ft^2 Office	UNK	UNK
PP 89-127 Northeast quad Technology Drive and Hall Avenue	38,000 ft^2 Industrial	UNK	UNK
PP 91-014 Southwest quad Hall and Crocker Avenues	Four story office building	UNK	1
PP 89-119 Crocker Avenues south of Hall Avenue	57,000 ft^2 Industrial	UNK	UNK
PP 89-106 Tourney Road	42,000 ft^2 Industrial	UNK	UNK
PP 91-004 Hopkins Avenue north of Anza Drive	20,000 ft^2 Office	UNK	1
PP 90-065 Hopkins Avenue north of Anza Drive	126,000 ft^2 Industrial	UNK	UNK
PP 90-102 Stanford Avenue north of Scott Avenue	18,000 ft^2 Office	UNK	1
PP 91-030 Bouquet Canyon Road south of Valencia Boulevard	2,304 ft^2 fast food restaurant	UNK	1
PP 91-058 Tourney Road	58,000 ft^2 medical offices	UNK	1
PP 92-023 Southeast quad Valencia Boulevard and Santa Clara River	25,000 ft^2 office addition	UNK	1

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

TRACT 47863 Whites Canyon Road north of Nadal Street	Single family development	UNK	80
CUP 91-001 Seco Canyon Road at Paragon Drive	39,000 ft^2 Commercial	UNK	UNK
PP 90-067 Soledad Canyon Road east of Bouquet Canyon Road	111,000 ft^2 Commercial or industrial	UNK	UNK
TRACT 47320 Bouquet Canyon Road east of Sutter's Pointe	Mixed single family and multi-family/commercial	UNK	4 SF; 20 MF/C
CUP 90-032 Northeast quad Soledad Canyon Road and Lakemore Drive	36,000 ft^2 Commercial	UNK	UNK
PP 90-062 Soledad Canyon Road west of Shangri-la Drive	79,000 ft^2 Commercial	UNK	UNK
TRACT 46579 Felbridge Street at Springs Avenue	Single family detached	UNK	10
TRACT 50488 North of Roachelle Drive	Single family detached	UNK	47
TRACT 43589 South of Canterwood Drive	Single family detached	UNK	77
PP 92-017 Welhaven Street	1,944 ft^2 fast food restaurant	UNK	1
TRACT 49426 Oak Spring Canyon Road	Multi-family	UNK	24
TRACT 49334 Between Triumph Avenue and Sand Canyon	Single family detached	UNK	38
TRACT 47324 East of San Canyon Road	Single family detached	UNK	70
TRACT 48379 Sierra Highway	Multi-family	UNK	35

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

TRACT 48480 Sierra Highway	Multi-family	UNK	46
PP 89-081 Sierra Highway	Multi-family	UNK	35
TRACT 49771 Sierra Highway	Multi-family	UNK	37
TRACT 32519 San Canyon Road at Canyon Breeze Village	Single family	UNK	147
TRACT 49771A Adon Avenue	Multi-family	UNK	28
CUP 90-033 Sierra Highway	Motel	UNK	48
TRACT 47803 Northwest quad Soledad Canyon Road and Prairie Lane	Single family	UNK	140
TRACT 45416 Canvas Street	Single family	UNK	253
PP 89-146 Northeast quad Lost Canyon and San Canyon Roads	30,000 ft^2 Commercial	UNK	UNK
CUP 90-034 Stillmore Lane	50,000 ft^2 Commercial	UNK	UNK
TRACT 46353 City of Santa Clarita Planning Area IV	Multi-family	UNK	115
PP 90-112 Lost Canyon Road east of San Canyon Road	39,500 ft^2 Commercial	UNK	UNK
PP 91-028 Southeast of Sierra Highway	Apartments	UNK	12
PP 91-029 Southeast of Sierra Highway	Apartments	UNK	24

PP 91-044 Northwest quad Soledad Canyon Road and Shadow Pines Boulevard	19,000 ft^2 Commercial	UNK	UNK
TRACT 46005 Abelia Road	Single family detached	UNK	86
TRACT 44896 Barnhill Road south of Oakdale Canyon	Multi-family	UNK	182
TRACT 48117 Golden Valley Road	Single family detached	UNK	104
WATT-PARKER TRACT Sierra Highway at Sierra Estates Drive	Single family detached	UNK	82
TRACT 48108 Flowers Court	Single family detached/School	UNK	161 SF
CUP 90-021 City of Santa Clarita Planning Area V	113,000 ft^2 Commercial	UNK	UNK
CITY OF SANTA CLARITA Southeast quad Soledad Canyon Road and Bouquet Canyon Road	100,000 ft^2 Office	UNK	UNK
TRACT 48893 Mountain Pass Road	Single family detached	UNK	161
TRACT 44360 Isabella Parkway	Single family detached	UNK	99
TRACT 49549 Isabella Parkway	Single family detached	UNK	55
TRACT 49647 Isabella Parkway	Single family detached	UNK	29
TRACT 44359 Isabella Parkway	Single family detached	UNK	187
TRACT 48892 Sierra Highway	Single family detached	UNK	119

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PP 91-008 San Fernando Road	100,000 ft^2 Commercial	UNK	UNK
TRACT 46878 Placeritas Boulevard	Single family detached	UNK	16
CUP 90-021 Mandran Street	98,000 ft^2 Commercial	UNK	UNK
PP 30797 City of Santa Clarita Planning Area V	74,000 ft^2 Commercial	UNK	UNK
TRACT 45022 Sierra Highway	Single family detached	UNK	104
PP 91-052 Golden Valley Road	40,000 ft^2 Warehouse	UNK	UNK
PP 91-026 Redview Drive	24,550 ft^2 Office	UNK	1
PP 91-069 Circle Ranch Road	Single family detached	UNK	24
WITHIN THE UNINCORPORATED AREA OF VENTURA COUNTY (6)			
See Los Angeles County for West Valley Conveyance Project.			

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

WITHIN THE CITY LIMITS OF SIMI VALLEY [7]			
PROJECT **Location**	**Description**	**Acres**	**Units**
WHITEFACE SPECIFIC PLAN Big Sky Ranch, south of Whiteface escarpment, and approximately 5,000 feet north of SR-118	Three-canyon development, including three single family residential developments, three golf courses, and one neighborhood commercial development	2,686	1,492
PD-S-827; LD-S-527 Brandeis Avenue, 650 feet east of Tapo Canyon Road	Manufacturing facility including one two-story, 120,000 ft^2 structure	6.96	1
METROLINK COMMUTER RAIL STATION (SUP-S-402) South side of Los Angeles Avenue, 800 feet west of Stearns Street	Transit station, including 291,850 ft^2 station platform and parking	6.73	N/A
PD-S-727 Northeast corner of Sycamore Drive and Alamo Street	Two story, 18,440 ft^2 office building	1	1
CC-S-8 Northwest corner of Tapo Canyon Road and Alamo Street	67,000 ft^2 commercial office building 8,150 ft^2 restaurant	2.24	2
SP-S-17 Southwest corner of Tapo Canyon Road and Alamo Street	226,000 ft^2 retail center	18.3	UNK
PD-S-763 East side of Tapo Street, 200 feet south of Alamo Street	23,149 ft^2 office building	1.28	1
SUP-S-352; LD-S-420; V-S-20 South side of Los Angeles Avenue, 250 feet east of Yosemite Avenue	Commercial center, including bank and drive through restaurant; 29,700 total square feet	2.55	UNK
SUP-S-392; MACDONALD'S Northwest corner of SR118 and Yosemite Avenue	Restaurant with drive-trough, 5037 square feet	3.68	1
TRACT 4456 Presidio Drive, 800 feet east of Tapo Canyon Road	Single family detached	2.7	11
TRACT 4476 TE Stearns at Alamo Street	Single family detached	8.9	54
TRACT 4176 Kuehner Drive, north of Katherine Street	Single family detached	52	217

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

TRACT 4801 North of Presidio Drive, at Valencia Drive	Single family detached	2.6	26
TRACT 4491 Lemon Drive at Walnut Street	Single family detached	12.7	14
PD-S-526; RANCHO SIMI REC & PARK North of Los Angeles Ab\venue, west of Sterns Street	Park and recreation center	46	1
TRACT 4677 Yosemite Avenue, 250 feet north of Katherine Street	Single family detached	1.27	10
SUP-S-143; EVANGELICAL COVENANT CHURCH Alamo Street, 380 feet west of Kadota Street	Church	4.5	UNK
TPD-S-815 Los Angeles Avenue and Stow Street	Mobile homes	8.15	64
TRACT 4853 Los Angeles Avenue at Rory Lane	Multi-family	7.65	114
TRACT 2908 Kuehner Drive and State Route 118	Single family detached	83.7	24
LD-S-480 Barnard Street, west of Stearns Street	Single family detached	2	4
SUP-S-361 1792 Patricia Avenue	Senior congregate care, 120 beds	1.6	UNK
PD-S-29 Los Angeles Avenue, 570 feet west of Stearns Street	Single family detached	5.78	43
TRACT 4127 Apricot Road, 600 feet east of Tapo Street	Multi-family	1.4	22
PD-S-812; LD-S-500 Heywood Street, 1,00 feet west of Erringer Road	Apartments	4.1	75
TRACT 4689 Walnut at Felix Street	Single family detached	12.7	11

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

TRACT 4622 Yosemite Avenue, 1,000 feet north of East Katherine Street	Single family detached	2.5	12
PD-S-791 Yosemite Avenue, 700 feet north of Los Angeles Avenue	Apartment, senior and affordable	2.6	108
Tract 4807 Yosemite Avenue north of Flanagan Drive	Single family detached	22.22	97
TRACT 4808 Flanagan Drive, west of Yosemite Avenue	Single family detached	34.6	138
TRACT 4783 Tapo Canyon Road at Alamo Street	Single family detached	20	93
TRACT 4856 Rory Lane, 600 feet south of Los Angeles Avenue	Multi-family	3.77	70
PD-S-820 RANCHO SIMI OPEN SPACE AGENCY East terminus of Smith Road, 1800 feet east of Kuehner Drive	Park	196.1	N/A

WITHIN CALTRANS DISTRICT 7 ®

ROUTE Location	Description	Construction Year
I-5 (GOLDEN STATE FREEWAY) Osborne Street Interchange to 0.3 mile north, near Pacoima	Construct 0.3 mile of soundwall	1998/99
SR 101 (VENTURA FREEWAY) Postmile 11.6 though 12.6; SR-170 to Rothford Avenue, near North Hollywood	Construct 1.0 mile of soundwall	1995/96
SR 101 (VENTURA FREEWAY) Postmile 12.6 through 13.3; Rothford Avenue to Tujunga Wash, near Studio City	Construct 0.7 mile of soundwall	1994/95

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

SR 14 (ANTELOPE FREEWAY) Postmile 27.0 through 33.4; San Fernando Road to San Canyon Road, near Santa Clarita	Construct 6.4 miles of two HOV lanes	1994/95
SR 14 (ANTELOPE FREEWAY) Postmile 33.4 through 43.4; Sand Canyon Road to Escondido Canyon Road, near Santa Clarita	Construct 10.0 miles of two HOV lanes	1995/96
METROPOLITAN TRANSPORTATION AUTHORITY		
PROJECT **Location**	**Description**	
BLUE LINE EXTENSION City of Los Angeles, Union Station to the Burbank Airport	Extension of light rail service. 12 miles, 10 stations.	
VALLEY EAST-WEST LINE City of Los Angeles, either Universal City (Alt. #1) or North Hollywood (Alt #2) to Warner Center near Woodland Hills	Extension of heavy rail service. Alt #1: all aerial over the Ventura Freeway, 16 miles, 15 stations. Alt #2: nearly all subway, 14 miles, 10 stations.	
METROLINK, ANTELOPE VALLEY Majority within unincorporated Los Angeles County, from Santa Clarita to Lancaster.	Commuter rail utilizing mostly existing rail. 43 miles, 3 or 4 stations.	
LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS		
PROJECT **Location**	**Description**	
BURNET DRAIN City of Los Angeles, from Parthenia Street to Chatsworth Street	18,350 linear feet of storm drain RCP and RCB of varying sizes. Within existing rights-of-way.	
DEVONSHIRE DRAIN City of Los Angeles, from Plummer Street to just north of the Simi Valley Freeway	14,590 linear feet of storm drain RCP and RCB of varying size. Within existing rights-of-way.	
PROJECT 9250 City of Los Angeles, from Burbank Boulevard to Sheldon Street	Approximately 37,700 linear feet of storm drain RCP and RCB of varying size. Within existing rights-of-way.	

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

GOLDEN VALLEY ROAD City of Santa Clarita, Newhall Ranch Road to Green Mountain Drive	Acquire 80 feet of right-of-way and easements between Via Princessa and Sierra Highway and Newhall Ranch Road and Soledad Canyon Road. Widen and/or construct roadway, improve or construct drainage, construct bridge and levee improvements, construct grade separation overhead, signalization.
LOST CANYON ROAD Majority within Los Angeles County, Via Princessa to Sand Canyon Road	Acquire various amounts of right-of-way plus easement between Tentative tract map 45023 and San Canyon Road, construct roadway, drainage improvements, structures, levees, signalization.
SR 126 City of Santa Clarita, I-5 to SR 14	Acquire 120 feet of right-of-way plus easements between Golden Valley Road and Sierra Highway, widen to four lanes, improve drainage, structures, upgrade from two to four lanes.
SAND CANYON ROAD City of Santa Clarita, at SR 14 and at Santa Clara River	Widen bridges and approaches, improve drainage, modify ramps.
SOLEDAD CANYON ROAD Santa Clarita, Sand Canyon Road to Oak Springs Canyon Road	Acquire right-of-way plus easements to construct 100-foot wide highway, drainage improvements, signalization.
WHITES CANYON ROAD City of Santa Clarita, Via Princessa to Sierra Highway	Acquire right-of-way, construct roadway and drainage, widen structure.
RIO VISTA ROAD City of Santa Clarita, Bouquet Canyon Road to Soledad Canyon Road	Acquire various amounts of right-of-way plus easements. Construct roadway, construct drainage improvements, construct bridge.
PLUM CANYON ROAD Majority within Los Angeles County, easterly terminus of existing to northerly terminus of Whites Canyon Road	Construct two lanes and appurtenant improvements.
NEWHALL RANCH ROAD City of Santa Clarita, Rio Vista Road to Golden Valley Road	Acquire 120 feet of right-of-way plus easements, construct two lanes, construct drainage improvements.

Reasonable foreseeable Development
Located Within 15 miles of the Proposed ESWMF

PARKER ROAD/1-5 INTERCHANGE Los Angeles County, northwest of Santa Clarita	Widen and upgrade interchange.
BACKER ROAD/I-5 INTERCHANGE Los Angeles County, northwest of Santa Clarita	Widen and upgrade interchange.
THE OLD ROAD Los Angeles County, McBean Parkway to Pico Canyon Road	Acquire 50 feet of right-of-way plus easements, construct drainage improvements, signalization, construct (add) two lanes.
PICO CANYON ROAD Los Angeles County, The Old Road to 4,400 feet west of The Old Road	Acquire right-of-way, construct drainage structure, widen.

Notes:
"UNK" = Unknown, information not available
"N/A" = Not applicable
"Reasonably foreseeable development" is generally that for which a development application has been made or approved, but whose construction is not yet complete. Projects included on the list are located within a 15-mile radius of the center of the project property.

(1)Reasonably foreseeable development for that portion of the Angeles National Forest within 15 miles of the proposed ESWMF. This area approximately extends from the western boundary of the Angeles National Forest (west) to Iron Mountain/Iron Canyon (east). Information regarding reasonably foreseeable development was extracted from a listing of pending projects provided by the Tujunga Ranger District of the Angeles National Forest; the USFS verified the extracted projects list.
(2)Reasonably foreseeable development for that portion of the unincorporated area of Los Angeles County within 15 miles of the proposed ESWMF. This area approximately extends to Castaic Lake (north), the northern limit of the City of Los Angeles (south), the Los Angeles/Ventura County line (west), and the western boundary of the Angeles National Forest (east). Information regarding reasonably foreseeable development was provided by the County of Los Angeles Department of Regional Planning, the Southern California Association of Governments (SCAG) and the Metropolitan Water District of Southern California (MWD).
(3)Reasonably foreseeable development for that portion of the City of Los Angeles within 15 miles of the proposed ESWMF. This area approximately extends to the northern City limit in the vicinity of Olive View (north), Encino/Tarzana/portions of North Hollywood (south), the western limit of the City in the vicinity of Orcutt Ranch (west), and the eastern City limit in the vicinity of Sunland/Tujunga (east). Information regarding reasonably foreseeable regional scale development was provided by SCAG, the City of Los Angeles Public Works Department, the Los Angeles Department of Water and Power, MWD, and the Metropolitan Transportation Authority.
(4)Reasonably foreseeable development for the City of San Fernando, located entirely within 15 miles of the proposed ESWMF. Information regarding reasonably foreseeable development was obtained from the City's Community Development Department.
(5)Reasonably foreseeable development for the City of Santa Clarita, located entirely within 15 miles of the proposed ESWMF. Information regarding reasonably foreseeable development was obtained from the City of Santa Clarita Community Development.
(6)Reasonably foreseeable development for that portion of the unincorporated area of Ventura County within 15 miles of the proposed ESWMF. This area of eastern Ventura County approximately extends from Tripas Canyon eastward to the Ventura/Los Angeles County line. Information regarding pending development was obtained from the Ventura County Planning Department.
(7)Reasonably foreseeable development for that portion of the City of Simi Valley located within 15 miles of the proposed ESWMF. This area of eastern Simi Valley extends approximately from Sequoia Avenue to the eastern city limit. Information regrading pending development was obtained from the Simi Valley Panning Department.
(8)Reasonably foreseeable State transportation projects for that portion of District 7 within 15 miles of the proposed ESWMF (District 7 encompasses all of the area of concern). Information regarding reasonably foreseeable projects from a listing of pending projects provided by District 7. Identified projects are funded for construction in fiscal year 1998/99, and represent a "most probable" scenario.

APPENDIX G

GEOLOGIC AND HYDROGEOLOGIC TECHNICAL REPORT

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GEOLOGIC AND HYDROGEOLOGIC TECHNICAL REPORT ELSMERE CANYON SOLID WASTE MANAGEMENT FACILITY FOR U.S. FOREST SERVICE

Job No. 21351-006-128
February 1994

GEOLOGIC AND HYDROGEOLOGIC
TECHNICAL REPORT
ELSMERE CANYON
SOLID WASTE MANAGEMENT FACILITY
FOR U.S. FOREST SERVICE

Job No. 21351-006-128
February 1994

Prepared by:

DAMES & MOORE

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EXECUTIVE SUMMARY

A Class III solid waste management facility has been proposed at Elsmere Canyon, located approximately one-half mile east of State Route 14 near San Fernando Pass. The solid waste management facility will consist of a landfill disposal area (herein referred to as "landfill footprint") and support elements located elsewhere on the property under consideration (herein referred to as "project property"). The project property encompasses approximately 2,768 acres within an uninhabited and largely undeveloped area of Los Angeles County, California. Approximately 1,719 acres within the project boundary lies within the Angeles National Forest, with the balance of 1,048 acres consisting of private land. The landfill footprint will occupy approximately 898 acres of the project property.

This technical report describes existing regional and local geologic and hydrogeologic conditions relevant to the proposed project, and provides conclusions and interpretations which can be used in evaluation of geologic and hydrogeologic impacts. Data resources include available published and unpublished technical reports and maps, contacts with technical experts, and site-specific data obtained during investigation of the project property. Detailed 1991 information is contained in a separate report which presents data collected to approximately September 1991. Additional geologic and hydrogeologic data collected in 1992 are contained in appendices to this report. This report integrates the data sets for the two years.

Elsmere Canyon is located within the Transverse Ranges Geomorphic Province of California, characterized by east-west trending mountain ranges. The project property lies near the western end of the San Gabriel Mountains, the most prominent of these ranges which have been formed from uplifted basement rocks lying to the southwest of the San Andreas fault. Topography of the project property is characterized by steep-walled canyons and grass and chaparral-covered ridges. An unnamed ridge, which ranges in elevation from approximately 2,350 feet to greater than 3,200 feet msl, forms the southwestern, southern, and eastern boundaries of the proposed landfill footprint within the confines of the project property.

The eastern portion of the project property is part of the Angeles National Forest and is currently undeveloped. The western portion is privately owned and has been used in the past for oil production. Two former oil-producing areas of the Newhall Oil Field, the Elsmere area and the Tunnel area, are located at the project property. Oil exploration began in the property in 1889 and continued through the 1930s, but no production currently exists onsite. Secondary land usages in western part of the property include cattle grazing, beekeeping, and right-of-way for electrical transmission lines and the Los Angeles aqueduct. The majority of land to the north, east, and south of the eastern portion of the property boundary is undeveloped land within Angeles National Forest. Privately-owned land surrounding other portions of the project property is used for a variety of purposes, including oil production facilities, transportation corridors, businesses, and some minor residential use. The landfill footprint will be located a minimum of one mile from any currently developed areas.

The regional geologic setting of the western portion of the Transverse Ranges is characterized by a pre-Tertiary-age complex assemblage of igneous and metamorphic crystalline basement rocks, and a Tertiary or Cenozoic-age overlying sequence of sedimentary deposits primarily deposited within the Ventura Basin region to the west. Basement rocks of the San Gabriel Mountains are primarily Precambrian to Cretaceous in age, separated into an upper plate and lower plate by the Vincent thrust. Upper plate basement rocks, comprising the majority of outcrops, are predominantly a Precambrian igneous and metamorphic complex which has been intruded by Permo-Triassic and Cretaceous-age igneous rocks. Lower plate basement rocks consist of the Pelona Schist, exposed primarily in the eastern Vincent thrust area and the Sierra Pelona area.

The regional sedimentary section of the western portion of the Transverse Ranges Province includes marine and nonmarine rocks deposited within the Ventura Basin, a major depocenter of the region. Although Cretaceous to Eocene-age rocks are present, a substantial portion of the Ventura Basin sequence is Miocene to Plio-Pleistocene in age, and the central trough area contains a maximum thickness of at least 40,000 feet of these strata. The eastern Ventura Basin contains a lesser thickness of Tertiary-age sediments in the Newhall area, a few miles west of the project property. In this region, the Miocene to early Pliocene-age sediments are represented by the Topanga, Modelo, and Towsley Formations. Of these, only the Towsley Formation, represented by a thin section of shallow to nearshore marine siltstone and sandstone, is present at the project property.

In the central Ventura Basin, the mid-to-late Pliocene-age and early Pleistocene-age Pico Formation consists of 10,000 to 13,000 feet of deep-water siltstone, interbedded sandstone, and mudstone deposited during a period of rapid basin subsidence. In the eastern portion of the Ventura Basin, the Pico is thinner and is indicative of transition from deep to shallow water conditions. Overlying the Pico Formation is the Saugus Formation, which is widely exposed in the Newhall area of the eastern Ventura Basin and also north of the San Gabriel fault in the Soledad Basin. Younger deposits in the area consist of the mid-Pleistocene-age Pacoima Formation, Quaternary terrace deposits and Holocene alluvium.

Within the past several million years in the Transverse Ranges, uplift of the San Gabriel Mountains occurred as a result of compression developed along the bend in the San Andreas fault. The uplift continues to present and is primarily accomplished by south-directed reverse faulting along the southern range margin, broad arching across the interior and uplift extending across the San Andreas fault. The San Gabriel fault, once a major structural element in this system, now apparently is not directly involved in regional right-lateral displacement. Transverse Ranges faults accommodating much of the regional compressive stress are generally east-west oriented, with reverse or reverse-oblique sense of displacement accompanied by uplift of the mountainous terrain of the Transverse Ranges.

The local geologic setting is characterized by highland areas of crystalline basement rocks overlain by a sedimentary section of Eocene and late Miocene to late Pliocene-age sedimentary strata, and young alluvium in the lower reaches of the property. Approximately 1,000 acres of the Elsmere Canyon project property is underlain by igneous and metamorphic crystalline basement, and most of the proposed landfill footprint will overlie these rocks. Crystalline basement rocks, collectively mapped as the San Gabriel Formation at the project property, are characterized by extremely varied assemblages of rocks occurring in highly deformed outcrops. Primary rock units include granite, diorite, schist, quartzite, and undifferentiated metasediments. A variety of intrusive, cross-cutting and deformational relationships occur among these rock assemblages, and they are typically moderately to intensely fractured.

Eocene rocks comprise the oldest sedimentary strata at the project property, exposed in a limited outcrop belt along the lower drainage areas of Elsmere Canyon. Eocene rocks are truncated against the Whitney Canyon fault and do not crop out east of the fault trace. Most of the section is comprised of thick, well-indurated, medium to coarse-grained sandstone and conglomerate with minor siltstone interbeds. Eocene rocks generally strike to the northwest and dip at about 40° to the southwest.

The Towsley Formation in the Elsmere Canyon area consists of siltstone, silty sandstone, and very fine-grained sandstone. The unit unconformably overlies Eocene rocks in the western part of the project property, and to the east, onlaps basement complex where it thins and pinches out against the basement surface. The formation is approximately 300 to 400 feet thick in the western portion of the project property. The Towsley Formation includes a lower and upper member, the latter of which can be further divided into three mappable units. The lower member is typically a massive bedded, fine to medium-grained, well-indurated sandstone. In many areas of the project property, this unit is highly petroliferous with numerous associated tar seeps, and was the target for oil production in the Elsmere area in the 1930s. The upper member of the Towsley is about 200 to 220 feet thick and is dominated by siltstone, although the middle unit of the upper member is a medium to coarse-grained sandstone.

The Pico Formation overlies the Towsley Formation in the west part of the project property, and surface exposures extend beyond the project boundary to the north, south and west. The contact with underlying Towsley deposits has been mapped at the contact of the highest siltstone beds of the Towsley and overlying coarser-grained beds of the Pico. The lower member is a very poorly indurated, medium to coarse-grained sandstone with interlayered pebble conglomerate. The upper member consists of similar lithologies but is generally darker in color, contains more silt and is more indurated.

Younger deposits at the project property consist of the Saugus Formation and surficial deposits, comprised of alluvium, landslides and minor colluvium. The Saugus occurs only in the extreme northwest corner of the property. Mappable alluvial deposits are found within primary drainages in Elsmere Canyon. Numerous landslide deposits have been mapped in the sedimentary section in the western portion of the project property. The greatest number of landslides occurs in the Towsley Formation, especially in the uppermost siltstone member of this formation, with a few slides also present within the Pico Formation.

Structural elements at the project property consist of lineaments observable on aerial photographs, and faults, folds and fractures identified during geologic mapping. One predominant, and three less pervasive sets of lineaments were noted on aerial photographs. The most prominent set is oriented approximately northwest-southeast. The three less pervasive lineament sets are oriented north-south, northeast-southwest, and east-west, respectively. These features may be indicative of high-angle fracture zones and/or other geologic features, and appear to influence surficial drainage patterns and topography at the site.

Local faults identified at the project property occur predominantly within the sedimentary section in the western portion of the project property. These consist of the Whitney Canyon fault, Elsmere field faults A and B, Legion fault, Beacon fault, and Grapevine fault. In general, they are poorly exposed, have little, if any, geomorphic expression, and can only be located in a few scattered outcrops or inferred by bedding attitudes and relationships among geologic units. Earliest evidence of most of these local faults was based on subsurface oil field data, where several were postulated to form trapping structures for accumulations of oil. Within the project boundary, Elsmere field fault A is interpreted to be present in the Elsmere area, where the Legion fault appears to be the main trapping structure, and Elsmere Field fault B is interpreted to trap oil at the Tunnel area. The Legion and Beacon faults are south-dipping, reverse faults which are better exposed to the west of the property. The Legion fault extends southeast to nearly east-west across the property to the trace of the north-south trending Whitney Canyon fault. The north-dipping Grapevine reverse fault, which has been mapped along the southern boundary of the project property, is interpreted to be a structural element of frontal range thrust faults present along the southern margin of the San Gabriel Mountains. There is no evidence that suggests Holocene activity on local faults identified at the project property.

The Whitney Canyon fault (WCF) is a north-south trending, high-angle, west-dipping structure that has juxtaposed Eocene strata against crystalline basement rocks. A portion of the proposed landfill footprint will overlie the mapped trace of the Whitney Canyon fault, and additional field investigation, including trenching, was focused upon its mapped extent on the project property and extensions of the fault north and south of this area as mapped by others.

Some of the early information on the WCF is based on subsurface oil field data in which the WCF and other faults were postulated to explain local oil deposits in the Newhall region. Other information on the fault is from previous geologic studies which recognized Eocene rocks juxtaposed against Pliocene strata along the fault at Elsmere Canyon. These studies typically also mapped the fault as a relatively continuous, single north-south oriented structure south from Elsmere Canyon to the vicinity of the Grapevine fault and extending north to the San Gabriel fault. In general, however, the WCF is poorly exposed and has little geomorphic expression, which has led to differences and inconsistencies among previous workers in mapping of its trace.

Based on existing geologic information, two periods of activity have been inferred along the WCF. Several thousand feet of pre-Pliocene west-side-down displacement occurred juxtaposing Eocene rocks against basement complex rocks. A later episode activity resulting in apparent west-side- up vertical separation is inferred to have occurred during Pleistocene time affecting strata as young as mid-Pleistocene in age.

The project-specific fault investigation, which included aerial photograph interpretation, detailed mapping, and trenching/excavation at selected locations, confirmed the location and extent of the WCF on the project property. Trenching within Elsmere Canyon encountered the fault with apparent high-angle reverse, west-side up sense of separation at this location. Here, alluvial sediments of probable late Holocene age overlie and are not affected by the fault.

The investigation also evaluated areas north and south of the property where the fault and/or related fault splays have been depicted in previous geologic publications. While the mapped extent and attitude of the fault within the project property generally agrees with previous published mapping, the location and trend of the fault is less certain to the north and south of this area. In the northern direction, detailed project mapping does not support a single north to northeast oriented, relatively continuous fault trace as shown in previous studies. Instead, the WCF appears to separate into a number of northwest-striking splays, and there is substantial uncertainty as to the location, orientation, and continuity of the WCF north of Whitney Canyon.

Along the north flank of Placerita Canyon, excavation/surface scraping of a hillside where the WCF had been mapped in previous studies did not encounter the fault or any major fault traces, indicating that the WCF does not extend through this area. At a roadcut in Placerita Oil Field, an east-dipping fault which has been mapped in previous studies as the WCF, exhibits east-side up reverse sense of separation in contrast to west-side up sense of separation observed within the trench at Elsmere Canyon. As indicated above, absence of the WCF in the Placerita Canyon hillside scrape in combination with detailed geologic mapping and differing orientation/sense of separation relationships, casts considerable doubt on direct correlation of the WCF at the project property to the fault at Placerita Oil Field.

The most recent activity that can be inferred for the WCF is based on displacement of mid-Pleistocene-age Saugus Formation. Project-specific investigations did not yield data that conflict with this conclusion or provide more precise definition. Based on the information available, there is no evidence of active faulting on the WCF at the project property, and the fault is considered to be a Quaternary fault under the criteria adopted by the CDMG.

The distribution and concentration of fractures mapped at the project property appear to be dependent upon rock type, age and proximity to faulting. Fractures occur most frequently in basement complex rocks of the San Gabriel Formation, followed by the Towsley Formation and Eocene rocks. Basement rocks are extensively fractured in many outcrops, and fractures may be both open or healed with a variety of infillings. At the surface, most fractures are high-angle, with low-angle fractures occurring most frequently in weathered outcrops. In the subsurface, basement rocks are typically moderately to intensively fractured, as observed in drilling cores. Outcrops of sedimentary rocks of the Eocene section and Towsley Formation generally contain fewer number and density of fractures than crystalline basement, except near faults. Finally, no preferred orientation of fractures occurring in either crystalline or sedimentary rocks is evident from the available data.

Existing or potential geologic hazards identified at the project property consist of seismic hazards and geotechnical hazards. The primary seismic hazard would be strong ground motion generated by a moderate to large-size earthquake occurring on one of several regionally active or potentially active faults or fault zones in close proximity to the project property. Active and potentially active faults evaluated as potential seismogenic sources include: San Andreas fault; Garlock fault; San Gabriel fault; San Fernando-Sierra Madre fault zone; Santa Susana fault zone; Verdugo-Eagle Rock fault; Northridge Hills fault; Santa Monica fault zone; Newport-Inglewood fault zone; Oak Ridge fault; and San Cayetano fault. Of these, the San Gabriel fault, San Fernando-Sierra Madre fault zone, and Santa Susana fault zone are located less than 5 miles from the project property and would have greatest potential to generate strong ground motion at this location. A maximum credible or maximum probable earthquake on the San Fernando-Sierra Madre fault zone would most likely generate the strongest ground accelerations at the project property, followed by an event on the San Gabriel fault or the Santa Susana fault zone. Local faults at the project property are not considered to represent significant potential seismogenic sources. In addition, based on their short lengths and lack of demonstrated recent activity, these faults have very low surface rupture potential.

A secondary seismic hazard at the property would be ground lurching along existing steep slopes or future excavated cut-slopes. The sedimentary section, particularly the Towsley Formation, is most prone to effects of ground lurching. Moderate to steep slopes developed in sedimentary terrain in the western portion of the property would be most susceptible to strong ground shaking effects where a variety of unfavorable pre-existing soil and bedrock conditions have weakened these rocks. The Pico Formation is more cemented and less prone to ground lurching effects, but may be susceptible along steep slopes and ridges where beds may be moderately to highly fractured.

The predominant existing or potential geotechnical hazards at the project property include moderately expansive soils, slope erosion, and slope instability. In general, soils at the project property have low to moderate expansive characteristics and are moderately to highly susceptible to sheet and rill erosion.

Existing landslides mainly occur in sedimentary rock units of the Towsley and Pico Formations, and Eocene rocks. Many of the larger landslides identified on the property occur on large dip slopes and appear to have failed along bedding planes that dip out-of-slope at less than the slope angle. The uppermost siltstone member of the Towsley Formation appears to be the most susceptible to sliding due to unfavorable bedding structure and relatively weak bedrock strength. The greatest potential slope stability hazards would be expected in sedimentary formations, particularly the upper siltstone member of the Towsley Formation. The San Gabriel Formation is generally considered to be less prone to slope stability hazards or large-scale landsliding.

The project property and surrounding area lies within the mountainous portion of two major groundwater basins, consisting of the Santa Clara River Basin and the Los Angeles River Basin. Most of the property lies northwest of the major drainage divide separating these two basins and falls primarily within the mountainous land of the Santa Clara River Basin drainage area, with the smaller portion of the property southeast of the divide included within mountainous drainage area of the Los Angeles River Basin. Under the basin system nomenclature of the California Regional Water Quality Control Board, most of the project property and all of the landfill footprint lies within mountainous drainage area of the

Eastern Hydrographic Subarea of the Santa Clara River Basin. Regionally productive or potentially productive fresh water-bearing units within the Eastern Hydrologic Subarea consist of undifferentiated alluvial or valley fill deposits underlying the Santa Clara River and its tributaries, and partially consolidated, sediments of the Saugus Formation. Regional geologic formations that can be considered as aquitards include older Tertiary-age sedimentary deposits underlying the Saugus Formation, such as the Pico and Towsley Formations and Eocene section, and crystalline basement rocks exposed in the western San Gabriel Mountains. In the Eastern Hydrographic Subarea, groundwater flow direction also follows the river drainage, but varies according to topography and orientation of the various tributaries contributing to regional groundwater flow. In the Newhall-Saugus area, groundwater flows north-northwest following the drainage course of the South Fork of the Santa Clara River and its contributing drainages.

Groundwater within the region has existing beneficial uses, and is produced by several private and municipal purveyors primarily for agricultural, and to a lesser extent, municipal and industrial uses. Regional water quality ranges from a calcium-bicarbonate character within the eastern upgradient areas to a degraded sodium-sulfate character in western downgradient areas. Generally, west of the project property, increasing TDS (total dissolved solids) concentrations downgradient within the river valley are attributed to irrigation returns, evapotranspiration, and discharges of treated sewage effluent. Groundwater has also locally been impacted by shallow occurrences of oil and oil-related brines in some areas west of the project property.

Four principal hydrogeologic units occur at the project property, including the San Gabriel Formation, Eocene Rocks, Towsley Formation, and alluvial sediments. The Pico Formation, although a weakly to moderately-cemented coarse-grained deposit, does not contain significant quantities of groundwater at the property because of its topographic position above the local groundwater table. Groundwater occurs within secondary fracture porosity developed in the San Gabriel Formation, as the rock mass contains little or no primary porosity. The San Gabriel Formation is characterized by an interconnected fracture network of variable density and orientation. Hydraulic conductivities and transmissivities are relatively consistent and higher for the San Gabriel Formation than other formations at the property, suggesting that fractures are interconnected and capable of effectively transmitting groundwater. On a small scale within the fracture system, groundwater flow within saturated portion of the San Gabriel Formation likely occurs under heterogeneous, anisotropic conditions. On a larger scale that covers the area of the project property, groundwater flow within San Gabriel Formation rocks follows the relatively steep topography at the property, under hydraulic gradients exerted by this relief.

Eocene sedimentary rocks, although indurated and moderately cemented, contain groundwater within both primary intergranular porosity and secondary fracture porosity. Fracture density within these rocks increases in the vicinity of local faults. Hydraulic conductivities and transmissivities are similar to those of the San Gabriel Formation. Alluvium occurring within the Elsmere Canyon drainage is a shallow ephemeral aquifer that transmits appreciable quantities of water only during and after precipitation events.

The Towsley Formation, comprised predominantly of siltstone, claystone and fine-grained sandstone, has extremely low hydraulic conductivities based on in-situ packer testing. The upper member, dominantly a siltstone and claystone, is interpreted to be an aquitard. Groundwater occurring in the Towsley is either present as perched water within sandstone lenses and layers in the upper member, or within coarse-grained deposits of the lower member, which typically contains naturally occurring petroleum hydrocarbons. Overall, the formation, which occurs stratigraphically above both the San Gabriel Formation and Eocene rocks, may act as a barrier to any significant upward flow into overlying units at the project property. Because the coarse-grained lower member of the Towsley Formation is typically oil-bearing in the subsurface and tar-saturated in surface exposures, its inherently limited ability to efficiently transmit groundwater has been further reduced.

Local geology and topographic relief are the controlling factors in the occurrence and flow of groundwater in the project property. The combination of these two factors also influences recharge/discharge areas and conditions, hydraulic gradients, and hydraulic relationships among water-bearing rocks and aquitards at the property. The groundwater potentiometric surface generally appears to follow the overall topography of the ground surface. Groundwater flow direction at the property is predominantly to the northwest, from higher areas along East Firebreak Road ridgeline, a major groundwater divide, toward the lower portion of Elsmere Canyon. The groundwater gradient northwest and downslope of this divide is relatively uniform toward the northwest, but bends into a U-shaped configuration in the area of the north and south Elsmere Canyon confluence, generally following surface topography. In the southern portion of the project property, groundwater flow is more toward the west and southwest, separated from the main flow area by a broad groundwater divide roughly coinciding with a topographic west-trending ridgeline. A second U-shaped, southwest-directed groundwater flow configuration appears to be present at the property south of this divide.

Infiltration and recharge to local rock units is limited because of steep topographic gradients and thin soils developed over well-indurated bedrock with limited permeability. During moderate and heavy periods of precipitation, a substantial portion of the precipitation received within the Elsmere Canyon watershed leaves the property as surface flow. Most recharge to the local hydrologic system takes place in topographically elevated areas, and groundwater discharge occurs within the lower drainages of Elsmere Canyon. Under existing steep hydraulic gradients, the fracture network developed in the San Gabriel Formation, with its limited storage capacity, exhibits fairly responsive recharge and discharge to moderate and heavy precipitation events. Recharge and discharge occurs through complex fracture pathways under flow rates controlled by fracture size, density and interconnectivity, as well as hydraulic head. Groundwater recharge to Eocene rocks occurs both by direct infiltration of precipitation and by subsurface flow from the saturated portion of the San Gabriel Formation in hydraulic communication with these strata. Based on order of magnitude differences in hydraulic conductivities between Towsley deposits and San Gabriel Formation/Eocene rocks, there is likely very limited lateral flow of groundwater into Towsley strata. Discharge from saturated San Gabriel Formation and Eocene rocks occurs from springs and seeps in outcrops located within Elsmere Canyon and then flows into shallow alluvial deposits in the canyon drainage.

Groundwater flow within the vicinity of the Whitney Canyon fault likely follows through a locally complex path, given the increased degree of fracturing and presence/absence of fault gouge, which is partly a function of juxtaposed rock type. However, this flow may be expected to return to the general northwest flow pattern controlled by topographic conditions and the WCF is not believed to significantly impede overall groundwater flow or substantially alter flow direction.

Groundwater quality in the eastern portion of the project property occurring in San Gabriel Formation crystalline rocks is generally good and contains low total dissolved solids (TDS) concentrations. In contrast, groundwater occurring in sedimentary units within the west and northwest portions of the project property is higher in TDS and has been locally degraded by naturally occurring hydrocarbons. Groundwater has been impacted by crude oil and oil-related brine in the Elsmere and Tunnel areas, and in the vicinity of tar deposits and active oil seeps.

The majority of local groundwater flow is interpreted to occur in a northwest direction along the Elsmere Canyon watershed drainage and exit the project property at the northwest corner. This flow is part of the regional flow system within the Eastern Hydrographic Subarea of the Santa Clara Hydrologic Basin. Because the southern portion of the property straddles a major drainage divide, groundwater south-southeast of this divide flows south and southwest within the watershed of the Upper Los Angeles River area. Groundwater flow beneath the proposed landfill footprint including its southern portion, is primarily toward the west and northwest within the Eastern Hydrographic Subarea.

At the project property, the Towsley Formation is a fine-grained, laterally continuous deposit of very low hydraulic conductivity, and regional studies indicate that the Towsley is of similar lithology and thickens dramatically to the west. As such, the Towsley Formation constitutes a local and probably regional aquitard to westward flow of groundwater from water-bearing portions of San Gabriel Formation and Eocene rocks into regional aquifers of the Saugus Formation and thick alluvium within the Santa Clara River Basin.

The landfill footprint will overlie San Gabriel Formation and Eocene rocks, and landfilled material will be buttressed against Eocene rocks and Towsley Formation within Elsmere Canyon North and South. The landfill will not be in direct hydraulic communication with regionally important aquifers within Saugus Formation and thick alluvium in Santa Clara River valley further to the northwest. Since the Towsley Formation overlies local water-bearing rock units and underlies regional aquifers to the west, potential upward flow of locally-derived groundwater into regional aquifers is restricted. The pathway of local groundwater flow originating beneath the proposed landfill footprint would be limited to shallow subsurface flow in a northwest direction along the Elsmere Canyon drainage. This flow is interpreted to primarily occur through shallow stream bed alluvium, and to a lesser extent, may flow downward into Pico deposits in contact with stream bed alluvium in the lower reaches of Elsmere Canyon. After exiting the project property, local flow continues in a downgradient direction toward thicker alluvial sediments in the South Fork of the Santa Clara River drainage and possibly downward into Saugus Formation in contact with alluvium northwest of the property.

1.0 INTRODUCTION

Elsmere Corporation (proponent) proposes to construct and operate a Class III, management facility at Elsmere Canyon, located approximately ½ mile east of State Route (SR) 14 near San Fernando Pass. The solid waste management facility will consist of a landfill disposal area (herein referred to as "landfill footprint") and support elements located elsewhere on the property under consideration (herein referred to as "project property"). The project property encompasses 2,768 acres within an uninhabited and largely undeveloped area of Los Angeles County, California (Figure 1). Within the project boundary, 1,719 acres lie within the Angeles National Forest, with the balance of 1,049 acres consisting of private land.

Proposed land uses within the confines of the project property include: a waste disposal area (landfill footprint; Plate 1); an access road and highway interchange; onsite ancillary facilities; and, an equestrian/hiking trail. The access road would traverse the northwest and west-central portion of the project property, with ancillary facilities located on two pads constructed north and south of the road in the west-central part of the property, respectively. Borrow material for the landfill would be obtained from the footprint area and from material excavated for access road and construction of ancillary pads. The balance of land within the property boundary would remain as buffer area.

1.1 PURPOSE OF REPORT

An Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) will be prepared to assess various potential impacts that may result from the proposed project. This technical report serves as a primary reference for available regional and local geologic information at Elsmere Canyon and surrounding areas. It is intended to establish existing regional and local geologic and hydrogeologic conditions relevant to the proposed project, and provide information, conclusions, and interpretations that can be used to evaluate geologic and hydrogeologic impacts.

Data resources used in the preparation of this report include: available published and unpublished technical reports and documents; published and unpublished maps; personal and written contacts with knowledgeable technical personnel; and, reports, maps, studies, and other site-specific data prepared by consultants of the proponent. The report draws upon these sources of information in developing independent conclusions and interpretations concerning existing geologic conditions at the project area and project property.

1.2 PROJECT BACKGROUND

A geologic and hydrogeologic investigation at the project property was initiated by Moore & Taber in 1990. This work consisted of field mapping, drilling, and installation of a number of groundwater monitoring wells. Also during this time, a geophysical survey consisting of seismic refraction, seismic reflection and magnetometer profiles, was conducted by Ryland Associates. In November 1990, further geologic and hydrogeologic studies were conducted by Meredith/Boli & Associates (M/B&A) under the direction of Dr. Stephen Janes. A database report was prepared by Dr. Janes in November 1991, incorporating studies performed by M/B&A and other consultants up to that time (Janes, 1991). A large portion of the project property had been geologically mapped at a 1 inch equals 500 feet (1:6,000) scale. A total of 36 groundwater monitoring wells were completed and in-situ hydraulic conductivity tests (open-hole packer and well slug tests) were performed. In addition, several periods of water level measurements and one period of groundwater and surface spring sampling/chemical testing were completed. These data were presented in text, maps and appendices in the 1991 report (Janes, 1991).

Additional data collection was conducted from approximately March to August, 1992. The scope of additional geologic and hydrogeologic field studies was developed by Dames & Moore with input from Dr. Janes, and was approved by the U.S. Forest Service. Field activities were conducted by personnel of M/B&A, Dames & Moore, and Dr. Janes. The 1992 field investigation expanded upon the 1991 geologic database and included detailed mapping and trenching of the Whitney Canyon fault. Hydrogeologic investigation in 1992 included: mapping of springs and seeps to supplement 1991 data; installation of five additional groundwater monitoring wells; open-hole packer and well slug testing; water level monitoring on a bi-weekly and monthly basis; and two periods of groundwater/surface spring sampling and analytical testing. Data collected during 1992 are presented in appendices to this report.

The conclusions and interpretations developed by Dames & Moore and presented herein are a synthesis of investigations conducted in 1991, and the 1992 data appended to the report. Project geologic and hydrogeologic maps and data included were produced by

Dr. Janes or subconsultants. This information consists of geologic mapping data, fault investigation information, boring logs and well completion diagrams for the five additional wells, methods and results of packer and slug testing, water level measurements and well hydrographs. Analytical testing data for two periods of groundwater/springs sampling are presented elsewhere in two reports prepared by M/B&A (1992a; 1992b).

1.3 SUMMARY OF PREVIOUS STUDIES

There are numerous published reports on the geology of the eastern Ventura Basin and Western San Gabriel Mountains. However, only a few geologic investigations have specifically included mapping in Elsmere Canyon, and no work has been conducted on the hydrogeology of the canyon or adjacent canyon areas.

The earliest published geologic work in the area was conducted by the Geological Survey of California (Gabb, 1866-1869; Whitney, 1895). This work and several later studies investigated the stratigraphy of the area and the distribution of fossils in rocks exposed in the San Fernando Pass, the Tunnel Area, and Elsmere Canyon (Ashley, 1895; Watts, 1901; Arnold, 1907; English, 1914; Smith, 1919; Kew, 1924; Carson, 1926; and Grant and Gale, 1931). Early geologic maps of Elsmere Canyon were prepared by Arnold (1907) and Kew (1924). Detailed descriptions of the igneous and metamorphic rocks cropping out in the western San Gabriel Mountains and in the eastern part of Elsmere Canyon were included in Miller (1931 and 1934). Miller (1934) also included a geologic map of part of eastern Elsmere Canyon.

The first relatively comprehensive geologic map of Elsmere Canyon was included in the work of Oakeshott (1950), completed while preparing a geologic map of the San Fernando quadrangle. His map depicted a north-south trending fault bisecting Elsmere Canyon and juxtaposing Tertiary sedimentary rocks on the west against Cretaceous and pre-Cretaceous-age igneous and metamorphic rocks on the east. Subsurface correlations with oil-producing units in Placerita Oil Field were first proposed by Willis (1952). Winterer and Durham (1951 and 1954) also mapped Elsmere Canyon and formally described several units exposed in the canyon and in several other parts of the Ventura Basin.

The most recent surface geologic map of Elsmere Canyon was prepared by Kern (1973). He identified several lithofacies in the Towsley Formation, which he mapped as submembers, and described the fossil fauna of the formation. He did not study the igneous and metamorphic rocks exposed in the eastern part of the canyon. Correlations by Willis (1952) between surface units in the region and subsurface strata known from oil well logs were updated by Shields (1977) and Nelligan (1978).

2.0 LOCATION AND PHYSIOGRAPHIC SETTING

The Elsmere Canyon area is located within the Transverse Ranges Geomorphic Province of California (Norris and Webb, 1976) (Figure 2). Unlike other provinces in California, this province is characterized by east-west trending mountain ranges, including California's highest peaks south of the central Sierra Nevada, separated by intervening valleys. The province extends approximately 325 miles from Point Arguello and San Miguel Island on the west into Joshua Tree National Monument to the east. The northern boundary of the province occurs along the San Andreas fault from northwest Ventura County east to Cajon Pass. The southern boundary is delineated by an east-west trending chain of mountain ranges that include the San Bernardino Mountains, the San Gabriel-Verdugo Mountains, and the Santa Monica Mountains. The province reaches a maximum width of nearly 60 miles along the Ventura-Los Angeles County line, narrowing to about 40 miles at its western end.

2.1 PROJECT LOCATION

The project location lies near the western end of the San Gabriel Mountains, one of several individual ranges comprising the Transverse Ranges Geomorphic Province. The San Gabriel Mountains are an east-west trending range formed from basement rocks uplifted during the mid-to-late Quaternary. This mountain block, rising to over 10,000 feet in elevation at its eastern end, is up to 25 miles wide and extends over 60 miles from west to east (Norris and Webb, 1976). The San Gabriel Mountains are typified by steep, rugged topography and deeply incised canyon drainages, most of which are directed southward toward San Bernardino, San Gabriel and San Fernando valleys.

2.1.1 Elevation and Topographic Characteristics

Topographic coverage of the project property is provided by the U.S. Geological Survey (USGS) 7.5 Minute San Fernando, California Quadrangle map, scale 1:24,000 (1 inch equals 2,000 feet) (1966, photorevised in 1988). Topography of adjacent areas is provided by the USGS 7.5 Minute Oat Mountain, California Quadrangle (1952, photorevised in 1969), Newhall, California Quadrangle (1952, photorevised in 1988) and Mint Canyon, California Quadrangle (1966, photorevised in 1988; all scales 1:24,000).

Topography is characterized by steep-walled canyons and grass and chaparral-covered ridges. Elsmere Canyon proper begins near SR 14, where it joins Whitney Canyon at the upper drainage area of Newhall Creek (Figure 1). From SR 14, Elsmere Canyon extends to the southeast approximately one and one-quarter miles, where it divides into northern and southern branches, referred to as Elsmere Canyon North and South. Whitney Ridge, which ranges in elevation from approximately 1,800 feet to 2,700 feet above mean sea level (msl), bounds Elsmere Canyon to the north and northwest (Plate 1). An unnamed ridge, (referred herein as "East Firebreak Road Ridge") which ranges in elevation from approximately 2,350 feet to greater than 3,200 feet msl, trends in a northeast direction across the southeast portion of the project boundary (Figure 1). Total relief from the highest to the lowest point on the property is 1,473 feet.

2.1.2 Past Land Use

There is evidence that the San Gabriel Mountains have been occupied since prehistoric times by local Native American tribes, including the Gabrielino, Fernandeno, Tataviam, Ventureno Chumash Kitanemuk, and Serrano. The first recorded Spanish explorers traveled through this area in the late 1700s. Mining and homesteading were established in the San Gabriel Mountains beginning in the mid 1800s. The use of the mountains for recreation began in the 1880s and coincided with the real estate boom in the Cowlands (USDA, 1970). Oil exploration and development have occurred in the region and in Elsmere Canyon since 1889 (Winterer and Durham, 1962).

The eastern portion of the project property is part of the Angeles National Forest. Angeles National Forest was established in 1892 as the San Gabriel Timberland Reserve and was managed by the Department of Interior for watershed protection. In 1905, the Department of Agriculture obtained jurisdiction over the reserve, and in 1907 the Reserve was renamed as the San Gabriel National Forest. In 1908, it was renamed again as the Angeles National Forest (USDA, 1970). The land has been left undeveloped and used primarily for recreation and watershed protection.

The western portion of the project property is privately owned. Past land use has primarily involved oil exploration and development. Two oil-producing areas of the Newhall Oil Field are located at the project property and include the Elsmere area, located in the northern portion, and the Tunnel area, located in the southern portion. Oil exploration began in the Elsmere area in 1889 by Pacific Coast Oil Company, which drilled 20 wells in the area before being purchased in 1902 by Standard Oil Company of California (now Chevron). Several other oil lease holders developed wells in the Elsmere area between approximately 1900 and 1921, including Alpine Oil Company, Santa Ana Oil Company, E.A. and D.L. Clampitt, and Republican Petroleum Corporation. A total of 33 wells was developed in the Elsmere area. Production continued into the 1930s (Winterer and Durham, 1962). These wells have subsequently been abandoned in accordance with California Department of Conservation, Division of Oil and Gas (CDOG) regulations (Radian, 1992).

A jack power plant also was located in the Elsmere area. This was used as a central power plant for the Elsmere area wells. The power plant was decommissioned in the 1940s. (Radian, 1992).

The Tunnel area acquired its name from a former highway tunnel through San Fernando Pass. Oil exploration began in the Tunnel area in 1900 by E.A. Clampitt. Oil exploration continued in the area through 1943 by numerous companies including Southern California Drilling Company and York Smullin Oil Company. By 1943, thirty-one wells had been drilled in this area. In the early 1950s, several small operators, including Morton and Dolly drilled several shallow wells in the area (Winterer and Durham, 1962). Production continued into the 1950s; however, no production is continuing today, and Chevron has recently undertaken a well decommissioning program throughout the Elsmere area (Janes, 1991). The Tunnel area is also the site of the now decommissioned original Newhall Refinery (Walling, 1934).

Secondary land usages in the western portion of the project property include cattle grazing and beekeeping (Radian, 1992). In addition, portions of the First Los Angeles aqueduct and electrical transmission lines administered by the Los Angeles Department of Water and Power were constructed in the western portion of the property.

2.1.3 Present Land Use

The project property is currently largely undeveloped land within Los Angeles County. The eastern portion of the property is in the Tujunga Ranger District in Angeles National Forest and is designated for recreation and watershed protection. Access is limited to several dirt roads that are primarily used for fire control. The western portion of the property is privately owned, and there is currently no oil activity on former Chevron property. The former well locations have been graded (Radian, 1992). The First Los Angeles aqueduct and electrical transmission lines administered by the Los Angeles Department of Water and Power traverse north-south across the western portion of the project property. A pair of east-west trending transmission lines cross the south-central portion of the property. Cattle grazing and beekeeping also occur on this portion. The private portion of the property is designated as non-urban and hillside management in the Santa Clarita Valley Area Plan (City of Santa Clarita, 1991).

2.1.4 Proposed Land Use of Project Property

The proposed landfill footprint will cover approximately 898 acres of the east-central portion of the total of 2,768 acres under consideration. Other proposed land uses will be limited to the west-central and northwest portions of the project property consisting of two constructed facilities pad areas of about 45 acres, and access-road covering about 75 acres, including cut-slope areas. The remaining area will generally be left as undeveloped buffer space around project facilities, or will be designed for recreational (equestrian/hiking) use. The proposed landfill footprint will be a minimum of one mile from developed areas described below.

2.1.5 Adjacent Land Use

The majority of the area directly adjacent to the project property is undeveloped open space. Adjacent land to the north and east of the eastern portion of the property boundary is undeveloped land in Angeles National Forest. This land is also designated for recreation and watershed protection.

The majority of the area directly adjacent to the north and south of the western property boundary is either undeveloped or has been sparsely developed for a variety of uses, including residential, commercial, light-industrial, and public. The area north of Placerita Canyon Road and northwest of SR 14 is designated as mineral/oil conservation overlay. This designation identifies areas which have a mineral aggregate resource area and/or an oil field, and allows the continuation of mineral/oil usage while providing for development of the area (City of Santa Clarita, 1991). Several residential parcels exist about one mile north of the project property along Placerita Canyon Road, and approximately 1½ miles south of the project property between Foothill Boulevard and Angeles National Forest boundary. Placerita Canyon State Park and Disney's Golden Oak Ranch are located north and adjacent to the project property. Placerita Canyon State Park is utilized for recreation, including equestrian trails, and Disney's Golden Oak Ranch is a controlled access park used for a film set location.

West and adjacent to the project property is SR 14. Several liquid bulk storage tanks, pipelines, and facilities associated with Newhall Refinery (no longer operating) are located approximately one-half mile west of the property across SR 14. Several other businesses are located in the vicinity of Newhall Refinery, including a construction company, auto alarm installation shop, and Eternal Valley Cemetery (Radian, 1992).

A private parcel located south and adjacent to the project property is used as a "borrow area" to extract cover material for Sunshine Canyon Landfill. A 22-inch high pressure natural gas pipeline is located approximately 200 feet south of the access portion of the project property (Arimoto, 1991). The pipeline runs near Remsen Road and SR 14. AT&T also maintains an underground fiber optic cable near Remsen Road and SR 14. A Metropolitan Water District (MWD) filtration plant and the Los Angeles Reservoir are located approximately two miles south of the project property. An extensive residential area with interspersed commercial and institutional uses is located south of the project property in the Sylmar area.

3.0 CLIMATE

The climate of the study area is typified by warm, dry summers and mild winters with moderate precipitation. This climatic regime is consistent with the Mediterranean-type climate typical of most of southern California. Winds in the area are generally light to moderate in intensity. However, strong winds occur periodically, and depending on terrain, local wind speeds may reach 55 to 60 miles per hour (United States Department of Agriculture, 1970).

3.1 PRECIPITATION

Precipitation in southern California occurs mostly as rain, but during the winter snow falls at elevations above 5,000 feet are not uncommon. Weather patterns responsible for precipitation usually occur in the form of storms that move eastward and northeastward from the Pacific Ocean during the period between the winter months of November and April. Moisture laden air masses moving inland from the Pacific Ocean are slowed and elevated by mountain ranges, including the San Gabriel Mountains in the project region. These winter storms usually consist of one or more frontal systems that occasionally last four days or longer and account for about 90 percent of the region's precipitation. The remainder of the year is generally dry with infrequent thunder storms occurring during the summer months that contribute little to the total precipitation in the area. The dry season is not limited to the months between May and October, and drought periods recur intermittently (Lustig, 1956).

Typical mean seasonal precipitation in southern California can vary from 11 inches at the ocean, to 45 inches in some mountain areas, to less than 5 inches in the deserts. Based on a review of isohyetal data prepared by the State of California Department of Water Resources (CDWR) (1981) and the Los Angeles County Flood Control District (1982), the project property receives a mean annual precipitation of 16 to 20 inches, and could receive a maximum of 6 to 12 inches of precipitation in a 24-hour period. Additionally, based on a review of data prepared by the CDWR (1981), the maximum annual precipitation in the watershed encompassing the project property could total 19.79 inches.

Monthly precipitation data are available from the Placerita Canyon (No. 284) and Newhall (No. 32C) weather stations located near the project property. Data from these stations are maintained by the Los Angeles County Department of Public Works (LACDPW) and are available for a 65 year period from 1927 to 1992.

The Placerita Canyon station (No. 284) is located southwest of the City of Newhall and approximately 4 miles northeast from Elsmere Canyon, at an elevation of 1,485 feet above sea level. The average annual precipitation at this station during the 50 years between 1928 and 1978 was 20.09 inches. The extremes of precipitation recorded during this period ranged from a high of 40.84 inches in 1978 to a low of 8.71 inches in 1951. During this 50-year period, below average annual precipitation occurred during 31 years, and drought conditions of 11 inches or less annual precipitation occurred during 6 years. Above-average precipitation occurred during 18 years.

The Newhall station (No. 32C) is located in the City of Newhall approximately 6 miles northwest from Elsmere Canyon, at an elevation of 1,243 feet above sea level. The average annual precipitation at this station during the 65 years between 1928 and 1992 was 17.57 inches (Figure 3). The extremes of precipitation recorded during this period ranged from a high of 45.81 inches in 1978 to a low of 8.1 inches in 1951. During this period, below average annual precipitation occurred during 43 years, and drought conditions of 11 inches or less annual precipitation occurred during 15 years. Above-average precipitation occurred during 22 years.

3.2 EVAPORATION

Annual rates of evaporation from a standard 4-foot diameter pan are about 70 inches in coastal areas and 50 inches in mountains in the project region. Evaporation from lakes and reservoirs in coastal areas is typically about 75 percent of the pan figure. About 66 percent of annual evaporation in coastal areas occurs during the summer months of May through October. Potential annual evapotranspiration averages less than about 24 inches in the mountains. Potential evapotranspiration between the last freezing temperatures of spring and the first of fall are typically less than about 20 inches in the mountains. Actual annual evapotranspiration is about 10 to 12 inches in the mountains (United States Department of Agriculture, 1970).

Near the project property, monthly evaporation data were collected at the Newhall Weather station (No. 32C) described above. Data from this station are maintained by the LACDPW and available for 24 years between 1930 and 1969 when measurements were discontinued. Based on a review of data, the average annual evaporation at this station during the years that data are available was 63.95 inches. The extremes of annual evaporation recorded at this station range from a high of 77.76 inches during 1935-36 to a low of 48.85 inches during 1954-55.

3.3 INFILTRATION

Only general estimates of infiltration of precipitation for soils at the project property are available. Based on a review of documents prepared by the Los Angeles Flood Control District (1966), precipitation of 3 inches per hour could produce infiltration rates as great as 0.6 to 0.78 inches per hour, depending on soil type. However, the hourly average of the anticipated maximum 24-hour precipitation of 12 inches is only 0.5 inches. Infiltration at the project property resulting from rainfall of this intensity would range from 0.275 to 0.37 inches per hour, which appears to be a more likely indication of maximum infiltration rates for soils at the property. Much of the area of the proposed landfill is underlain by crystalline bedrock with thin (less than 1 foot) soil cover. Infiltration rates in this area are not known but likely would be much lower than where soil cover is deeper, such as areas underlain by sedimentary rocks.

3.4 SURFACE RUNOFF

Existing characteristics of the region and project property surface water runoff were assessed through a review of available existing reports, construction drawings, maps and data related to hydrology, drainage and flooding. Floodplain maps of Elsmere Canyon or upper Newhall Creek do not indicate that the project property lies within a 100-year floodplain area. Estimated flows and flood levels along the main watercourse for the 100-year storm event were modeled using the computer program HEC-1 (U.S. Army Corps of Engineers (USCOE), 1990). Cross-sections of the main watercourse were measured at specific locations using topographic information from maps, and flood water levels were estimated from the modeling.

3.4.1 Regional Setting

The project property includes the Elsmere Canyon watershed, which drains to the northwest in the western most part of the San Gabriel Mountains. Elsmere Creek in Elsmere Canyon and Whitney Canyon to the north form the headwaters for the main drainage into Newhall Creek. The single outlet from Elsmere Creek drains into Newhall Creek, approximately one mile west of the project property. Newhall Creek flows into the Santa Clara River six miles downstream of the Elsmere Creek confluence.

Elsmere Canyon is part of the Upper Santa Clara River watershed, defined as the watershed upstream of the Interstate 5 crossing of the Santa Clara River. The Upper Santa Clara River watershed has a drainage area measured to be 410.4 square miles (LACDPW, 1991). Elsmere Canyon has an area measured as 2.4 square miles, which represents about 0.6 percent of the Upper Santa Clara River watershed.

A sediment transport study of the Santa Clara River was conducted by the USGS (1979) which analyzed sediment data collected from 1928 to 1975. The particle size and volume of sediment were found to increase with the flow velocity of the river, and the sediment yield was found to vary along the river. The sediment yield for the Upper Santa Clara Basin was estimated to average approximately 900 tons per square mile (USGS, 1979).

3.4.2 Project Property

Watersheds of the project property include the southern portion of Elsmere Canyon, the eastern portion of Whitney Canyon, and the northern portion of Sombrero and Grapevine Canyons. Elsmere and Whitney Canyons drain into Newhall Creek; Sombrero and Grapevine Canyons drain into the San Fernando Valley. The landfill footprint will lie entirely within the Elsmere Canyon surface drainage.

Elsmere Canyon has relatively steep slopes, with the highest elevation at approximately 3,200 feet and the lowest elevation at about 1,400 feet where it passes under SR 14. The watercourse slopes steeply in the upper reaches, at over 0.35 feet horizontal to vertical (ft/ft), and decreases to a more gentle slope of 0.02 in the lower reaches. Upper reaches to the north and west have deeply incised V-shaped canyons, and in some cases nearly vertical walls. The length of Elsmere Creek is approximately 2.3 miles. Slope length and steepness are critical factors that control the velocity of runoff and contribute directly to the potential for erosion.

Aside from rainfall, surface flow in Elsmere Canyon emanates from natural springs at the project property. Flow from these springs appears to be highly variable and seasonal, including some seepage during the dry season from May through November, (Janes, 1991).

Creek flow is seasonally intermittent. Most rainfall occurs during December through April. A 100-year storm event over a 24-hour duration in Elsmere Canyon would produce about 12 inches of precipitation (CDWR, 1981; LACDPW, 1989). The base of the proposed landfill will be above the estimated 100-year flood level of Elsmere Creek.

The existing outlet from Elsmere Canyon is through a 14-foot high reinforced concrete arch culvert which curves horizontally under SR 14. Flow out of the culvert passes through a concrete rectangular channel and under SR 14 through a 11.5-foot diameter corrugated metal pipe into Newhall Creek.

The cross-section of Elsmere Creek varies in width over its course. This causes fluctuations in creek flow velocities. Where the channel is narrow, the flow velocities and depths increase; where the channel is wide, the velocities and depths decrease.

During storms in March 1991, when 6.36 inches of precipitation were recorded (LACDPW, 1991a) in nearby Newhall, runoff was observed to be flowing rapidly, and flows within a section of Elsmere Creek were estimated to have reached a depth of three feet and width of 15 feet. The runoff discharge was observed to decrease within a few days (Janes, 1991). Similar observations were made during site visits in January and March 1989.

During water year 1991-1992, the greatest precipitation occurred in February when 15.07 inches were recorded at Newhall Weather station No. 32C, followed by 7.66 inches recorded in March (LACDPW, 1992). Stream flow measurements were conducted at bi-weekly intervals at the project property from March 27 to June 5, 1992; these data are presented in Appendix A. Measurements were obtained at five stations located along the course of Elsmere Creek, from near its headwaters to the outlet of Elsmere Canyon near the northwest corner of the project property. The greatest volume of flow, up to 83.55 gal/sec (gallons per second), was measured during March when a total of 7.66 inches of precipitation was recorded at the Newhall Weather station. By early April, when only 0.15 inches of precipitation were gauged at Newhall station, the greatest volume of flow measured at the project property had declined to 23.71 gal/sec. No precipitation was recorded in Newhall during May, and by the early part of that month the maximum recorded volume at the project property had declined to 5.76 gal/sec. By late May, the greatest measured volume of flow had further declined to 2.92 gal/sec. In early June, flow measured near the outlet of Elsmere Creek had declined to only 1.27 gal/sec, but higher in the drainage, flow rates had increased from their previous measurements. Increased flow in the headwaters may have been in response to slight precipitation in early June when 0.1 inch was recorded at Newhall station. Low flow volumes in Elsmere Creek may be more readily apparent near its headwaters, where the channel is often in bedrock, than in its lower reaches, where shallow subsurface flow may occur within alluvium.

3.4.2.1 Methodology

The surface water hydrology for the project property was modeled using the HEC-1 computer program (USCOE, 1990). Watershed drainage characteristics included in the analysis were area, drainage paths and slopes, precipitation, soil conditions, vegetative cover, and initial and evapotranspiration losses.

For the surface water hydrologic assessment, the Elsmere Canyon watershed was divided into seven sub-basins. These sub-basins tend to be rounded and to have dendritic drainage patterns in areas of crystalline basement rock, and trellis type patterns in areas of sedimentary rock (Janes, 1991).

The moisture content of the soil appears to have a pronounced effect on runoff. The HEC-1 modeling assumed the ground to be saturated. Under this conservative scenario, initial losses were therefore considered negligible. Some losses were assumed on the basis of field measurements (LACDPW, 1989) for infiltration and evapotranspiration.

To estimate depths of flow, Manning's Formula for normal depth was applied at four nodal points, which are defined as where the sub-basin tributaries enter the main watercourses. The nodal points were designated A, B, C and D. Cross-sections were plotted at these locations. The typical upstream cross-section was found to be basically trapezoidal shaped with a narrow bed width of 10 to 20 feet and steep side slopes. The typical downstream cross-section was found to be trapezoidal shaped, but widened from 100 to 250 feet near the outlet from Elsmere Canyon, with much flatter side slopes. Channel slopes were estimated from mapping. Manning's roughness coefficient for the bed of the creek was estimated from field observations and standard tables to be 0.04 to 0.05 (Chow, 1959).

3.4.2.2 Results

Existing soils at the project property are typically fine to coarse-grained silty sand varying to sandy silt with locally exposed rock (discussion of soils is presented in Section 5.5). These types of materials, depending on slope steepness, length, and vegetation density, have a high potential for erodibility and are readily transported downstream with storm runoff. Elsmere Canyon and environs have steeply incised V-shaped drainages in an active state of erosion. As a result, during a major storm event, the suspended sediment volume, or bulking, could increase peak flow volume by approximately 70 percent. This bulking is considered in the calculations. Note that the bulking factor decreases with lower flow volumes (LACDPW, 1989). Results of hydrology calculations, including bulking factors, are tabulated below:

Sub-Basin or Node Designation	Sub-Basin Area (acres)	Cumulative 100-Year Clean Flow (cubic feet per second)	Velocity (feet per second)	Flow Depth in Creek (feet)	Flow Width in Creek (feet)
1	258				
node A		580	11	2	30
2	163				
3	303				
node B		1,610	16	7	20
4	79				
node C		2,360	11	3	105
5	261				
6	280				
7	167				
node D		3,250	2	6	390
TOTAL	1,511	3,250			

Based on results of this modeling, the watershed is very responsive to rainfall. Storm runoff and time to drain the watershed appear to be rapid. The velocity from the upper sections of the basin is estimated to be approximately 15 feet per second, which is considered high and erosive. As flows continue downstream where the creek widens and its slope reduces, the velocity is estimated to decrease to about one foot per second prior to passing through the outlet. Sedimentation is likely to occur in this area.

3.4.3 Landfill Footprint

The area of the landfill footprint and associated facilities is approximately 898 acres. This is nearly 70 percent of the Elsmere Canyon watershed area. Therefore, the surface water hydrology discussed above for the Elsmere Canyon watershed is a good representation of the hydrology of the landfill footprint.

Existing conditions within the proposed landfill footprint include steep terrain with ravines. Steep canyon slopes and channel gradients contribute to rapid runoff and concentrations of storm flow in this area. Detention and depression storage is relatively minor in this type of rugged terrain.

3.5 TEMPERATURE

Temperature in southern California is mild in winter and warm in summer. Typically, January and July are the coldest and warmest months, respectively. Winter generally becomes colder and summer warmer as distance from the ocean increases, while temperature decreases proportionally as topographic elevation increases. In the high mountains, summer temperatures average about 80° Fahrenheit (F), but can fluctuate between the 90's and low 50's. The Newhall area typically experiences an average January temperature of approximately 48°, but temperatures below 32° F are not uncommon; average temperature for July is approximately 77° F, but temperatures above 100° F are quite common (Oakeshott, 1958). Additionally, daily temperature extremes recorded during the past 44 years at the Dry Canyon Reservoir, located approximately 8.2 miles north-northwest of the property at an elevation of 1,460 feet MSL have ranged from a low of 15° F to a high of 113° F (Janes, 1991). Site-specific temperature data is not available. However, the property is situated at elevations significantly above Newhall and the Dry Canyon Reservoir, and temperatures there are anticipated to be generally cooler.

4.0 REGIONAL GEOLOGIC AND TECTONIC SETTING

The geologic history of the Transverse Ranges and surrounding adjacent provinces has been strongly dominated by the interaction of the North American and Pacific crustal plates along the San Andreas fault system. Typical of areas at or near plate margins, the regional structural geology is very complex due to a long history of tectonic interaction. Because of these complexities, it is useful to subdivide the region into segments to observe and interpret the structural geology. This information can then be synthesized into an overall regional and local tectonic framework and used to evaluate potential seismogenic sources.

The project property is located within the central Transverse Ranges. The regional geologic provinces within the area of the Transverse Ranges are summarized in subsections of Section 4.1. This is followed by a detailed discussion of the Transverse Ranges province in Section 4.2, since the project is located within this province. The geologic/structural evolution of the Transverse Ranges and adjacent areas is summarized in Section 4.3, including an overview of the contemporary structural framework of the project region. Discussion of regional seismicity and potential seismogenic sources, which draws upon regional geologic data in Section 4.0 and local geologic data in Sections 5.0 and 6.0, is presented in Section 7.0.

4.1 REGIONAL GEOLOGIC PROVINCES

California has historically been divided into several geomorphic provinces by earth scientists. Each province is characterized by a relatively unique physiography and geologic history. Since the geomorphology of a province is largely the result of its geology, the terms "geomorphic province" and "geologic province" are used interchangeably.

Geologic provinces that have regional significance in the structural evolution and contemporary tectonic framework of the Transverse Ranges include: 1) southern Coast Ranges; 2) Great Valley; 3) Sierra Nevada; 4) Mojave Desert; 5) Salton Trough; 6) Peninsular Ranges; and 7) Continental Borderland (Figure 2). The geology of these provinces is summarized below.

4.1.1 Southern Coast Ranges

The Coast Ranges extend for about 600 miles southward from the Klamath Mountains to approximately the Santa Ynez Mountains (Figure 2) and are arbitrarily divided into the northern and southern subprovinces at San Francisco Bay. The southern Coast Ranges province and the Transverse Ranges province to the south merge in a complex transition zone in the vicinity of the onshore and offshore Santa Maria Basin.

The southern Coast Ranges comprise several dissimilar rock assemblages that have been tectonically juxtaposed into their present position. These include the Franciscan subduction zone complex, the Great Valley forearc basin sequence, and crystalline igneous and metamorphic rocks comprising the Salinian block magmatic arc (Page, 1981). The Salinian Block has been displaced hundreds of miles from its original position and is tectonically flanked on both sides by the Franciscan Formation.

The Franciscan Formation has been interpreted to represent a subduction zone complex of deep-trench sedimentary deposits, oceanic crust material, and upper mantle rocks. The Great Valley sequence and its equivalents primarily consist of pre-Cenozoic clastic deposits occurring along the western flank of the southern Coast Ranges. The sequence is interpreted to have accumulated as deep-sea fan deposits within a forearc basin environment.

The Salinian block magmatic arc comprises a complex of granitic plutonic and metamorphic rocks that originated several hundred miles to the south of their present location (Page, 1981). Metamorphic host rocks are metasediments consisting of quartzofeldspathic gneiss, schist, quartzite, and metadolomite. These rocks have been tentatively correlated with other outcrops of metamorphic rocks in southern California (Wiebe, 1970; Ross, 1977), including the San Gabriel Mountains, but their affinities are not well defined. Late Cretaceous-age plutonic and metamorphic rocks are widespread and probably underlie much of the Salinian block. These vary from granodiorite and quartz monzonite to quartz diorite in composition, similar to that of the Sierra Nevada and Peninsular Ranges.

4.1.2 Great Valley

The Great Valley is a northwest-trending Cenozoic-age sedimentary basin located between the Sierra Nevada on the east and the Coast Ranges on the west (Figure 2), and extending northward from the San Andreas-Garlock fault intersection to the vicinity of Redding, California. The basin is asymmetric with its axis in the western part of the trough. Strata of the Great Valley are mildly deformed relative to surrounding geologic provinces, but contain a series of major folds along the steeper western flank parallel to the Coast Range-Great Valley boundary. The Great Valley was a marine environment adjacent to the ancestral Sierra Nevada during early Cenozoic time (Bartow, 1987). The basin contains over 25,000 feet of Cenozoic-age marine and nonmarine sediments that are indicative of upward transition from Sierran sediment sources to a mixed Sierran-Coast Range provenance.

The Great Valley is divided by the Stockton arch (and underlying Stockton fault) into the Sacramento Valley to the north and the San Joaquin Valley to the south. The Bakersfield arch further separates the San Joaquin Valley into the deep Maricopa-Tejon sub-basin at the south end adjacent to the Tehachapi-San Emigdio Mountains. The White Wolf fault, located under and south of the Bakersfield arch, has been responsible for the development of this structure (Bartow, 1987), and was the focus for the 1952 Arvin-Techachapi earthquake.

4.1.3 Sierra Nevada

The Sierra Nevada (Figure 2) comprises a large, mountainous, batholithic igneous and metamorphic complex extending in a north-northwest direction along eastern California for a distance of approximately 400 miles. At its southern end near the Transverse Ranges, the province merges with the Tehachapi Mountains and terminates along the Garlock fault zone. The mountain range consists of a complex series of igneous plutons intruded into rocks of pre-Jurassic age from a period of about 210 to 77 MYBP (million years before present) (Norris and Webb, 1976).

Pre-batholithic rocks consist of weakly to strongly deformed Paleozoic and Mesozoic-age strata (Bateman, 1981). These occur as wall rocks and roof pendants intruded by the crystalline plutonic sequence. Paleozoic country rocks exposed as roof pendants along the eastern margin of the batholith are predominantly carbonate, quartzite and pelitic rocks indicative of continental shelf and miogeoclinal depositional environments, whereas Paleozoic rocks occurring in the western metamorphic belt include metamorphosed volcanic strata, chert, and argillic rocks indicative of a former volcanic island arc environment. Mesozoic rocks include metasediments, volcanic deposits and volcanogenic sedimentary rocks that can be grouped into three distinct assemblages (Bateman, 1981). Mesozoic volcanic and volcanoclastic rocks in the central parts of the range occupy the core of the Nevadan synclinorium, interpreted to be an early Mesozoic Andean-type arc that was isoclinally folded prior to emplacement of the batholithic complex (Schweikert, 1981).

4.1.4 Mojave Desert

The Mojave Desert province is a wedge-shaped physiographic area that narrows westward toward the confluence of the San Andreas and Garlock fault zones (Figure 2). The province is bounded by numerous physiographic elements, including the Tehachapi Mountains-southern Sierra Nevada on the northwest, the Great Basin province on the north, and the San Gabriel and San Bernardino Mountains on the southwest and south, respectively. The eastern and southeastern boundaries are more arbitrary.

Precambrian-age crystalline rocks occur in widely scattered localities throughout the Mojave Desert province and include amphibolite-grade augen gneiss, quartzofeldspathic gneiss and schist of both igneous and sedimentary origin. These basement rocks are considered to be part of the North American Precambrian cratonic complex and appear to have developed in the same approximate position relative to surrounding, more mobile terrains (Ehlig, 1981). Overlying basement rocks is a late Precambrian to Paleozoic-age sedimentary sequence that consists of a variety of rock types, including quartzite, siltstone, shale, chert and carbonates. These sediments generally display an east to west transition from cratonic, continental rise/slope to basinal depositional environments. Mesozoic-age rocks, consisting chiefly of plutonic and volcanic rocks, were part of a shifting continental margin-type (Andean) magmatic arc (Burchfiel and Davis, 1981). These rocks trend northwestward across the Mojave Desert through pre-existing Precambrian and Paleozoic terrain.

The major structural features of the Mojave Desert are Mesozoic and Cenozoic in age, and developed at different times apparently somewhat in concert with magmatic activity. Burchfiel and Davis (1981) postulated that rocks of the western Mojave Desert region and adjacent area have been oroclinally bent in a clockwise sense occurring between latest Cretaceous and mid-Tertiary time.

4.1.5 Salton Trough

The Salton Trough lies at the southeast corner of the eastern Transverse Ranges and includes the Gulf of California (Figure 2). The central portion of this province is occupied by the Salton Sea, a manmade lake occurring at an elevation of 235 feet below sea level. The Salton Trough was formed in conjunction with the uplift and westward rotation of the Peninsular Ranges in Miocene time (approximately 20 million years before present (MYBP)) accompanied by the subsidence of the trough area. The province has been a depositional center since the Miocene, and contains a thick accumulation of both marine and nonmarine sediments. Geophysical evidence indicates that as much as 21,000 feet of sediments are present in the vicinity of the International Border (Norris and Webb, 1976). Most of this material has been derived from the eastern flank of the Peninsular Ranges and the Colorado River.

4.1.6 Peninsular Ranges

The Peninsular Ranges extend from the Los Angeles area at the edge of the Transverse Ranges south into Baja California, Mexico (Figure 2). The Peninsular Ranges are largely comprised of Cretaceous-age crystalline plutonic rocks that have forcibly intruded older, pre-batholithic rocks. Pre-batholithic rocks consist of metasedimentary and metavolcanic rocks ranging from late-Paleozoic to Mesozoic in age, and are believed to represent a previous sedimentary and volcanic arc complex (Gastil, et.al., 1978; Todd, et.al, 1987). The intrusive crystalline rocks are a complex of compositionally zoned plutons ranging from granites to gabbros, that were emplaced during two recognizable time periods during the Cretaceous (Silver and Chappell, 1988). The bulk of these rocks originated deep within the lithosphere where crustal material of the Pacific Ocean plate was subducted beneath the North American continental plate. Partial melting of the subducted oceanic plate created silicate melts, which then rose toward the surface as less dense, buoyant diapiric masses.

4.1.7 Continental Borderland

The Continental Borderland of California is predominantly a suboceanic geomorphic province extending from Point Conception, California to Cedros Island, Baja California, Mexico (Figure 2). The northern part, which encompasses the Santa Barbara Channel and the northern Channel Islands, overlaps the western offshore extension of the Transverse Ranges. The geology of the province is not well understood because of its relative inaccessibility. Geologic and tectonic conditions must be inferred from topographic, acoustic reflection, gravity and isolated rock sample data, supplemented by bedrock exposures in the California Channel Islands. Topographically, the Continental Borderland consists of a series of elongated, northwest-trending ellipsoidal to rhomboidal-shaped basins bounded by submarine ridges and escarpments. An exception to this trend is the western extension of the Ventura Basin along east-west trending Santa Barbara Channel, located north of San Miguel, Santa Rosa, and Santa Cruz Islands. The Continental Borderland narrows in width from north to south toward Cedros Island.

According to Howell and Vedder (1981), two types of basement rocks are present which have been juxtaposed by faulting: 1) upper Jurassic through lower Tertiary (?) Franciscan melange and blueschist of a subduction or accretionary complex; and 2) upper Jurassic ophiolite, arc-volcanogenic and forearc sedimentary rocks. Cretaceous and lower Tertiary strata representative of turbidite deposition overlie much of the central part of the borderland. The modern topography of the borderland developed in the Oligocene and Miocene. This development was accompanied by Miocene-age volcanism, as evidenced by volcanogenic rocks present on ridges and knolls throughout the province.

4.2 TRANSVERSE RANGES REGIONAL STRATIGRAPHY

Because the project is located within the central portion of the Transverse Ranges, the following discussion of regional stratigraphy focuses on this area. Included within the central Transverse Ranges are the San Gabriel Mountains and sedimentary deposits lying to the west of the San Gabriels and extending to the Pacific Ocean shoreline (Figure 4). The regional stratigraphy of this area can be divided into: 1) an older complex assemblage of crystalline basement rocks consisting of igneous rocks, and metamorphic rocks of both igneous and sedimentary origin; and 2) a younger sequence of sedimentary and minor volcanic rocks primarily deposited within the Ventura Basin region to the west (Figure 4 and Figure 5). These two groups are discussed below.

4.2.1 Basement Rocks

Basement rocks comprising the San Gabriel Mountains are a complex assemblage of igneous and metamorphic rocks primarily ranging from Precambrian to Cretaceous age. These are separated into an upper plate and lower plate by the Vincent thrust, which is exposed at the eastern end of the mountain range (Figure 4). According to Ehlig (1981), the Vincent thrust is also discontinuously exposed along the south flank of Sierra Pelona and is present at depth beneath the San Gabriel tectonic block. Upper plate rocks comprise the majority of basement exposures in the San Gabriel Mountains, with outcrops of lower plate rocks mainly limited to the area of the eastern exposure of the Vincent thrust, and to the Sierra Pelona area (Figure 4).

Upper Plate Rocks: Upper plate basement rocks predominantly consist of a Precambrian-age igneous and metamorphic complex which has been intruded by Permo-Triassic and Cretaceous-age igneous rocks (Figure 4). The upper plate Precambrian core has been interpreted to represent deep-seated continental crust likely derived from the North American craton (Ehlig, 1981). The oldest rocks consist of amphibolite facies, quartzofeldspathic gneiss and amphibolite dated to be at least as old as 1,715 ± 30 MYBP (Silver, 1966). These have been intruded by 1,670 ± 15 MYBP gneissic granitic and migmatitic rocks and later by a 1,220 ± 20 MYBP anorthosite-gabbro-syenite complex (Silver, et.al., 1963; Silver, 1966; 1971). The latter complex, interpreted by Carter and Silver (1972) to be an inverted cone-shaped laccolith body differentiated by crystal fractionation, is bordered on the south and southeast by granulite facies gneiss named the Mendenhall Gneiss by Oakeshott (1958). The Mendenhall Gneiss appears to have formed from the 1,670 MYBP terrain by thermal metamorphism with little associated deformation (Ehlig, 1981). Collectively, the various Precambrian intrusive assemblages are evidence of at least two major petrotectonic thermal events affecting upper plate rocks. The first event occurring at 1,670 MYBP was likely a regional continental orogenic event resulting in development of a gneissic granitic and migmatitic terrain. The second 1,220 MYBP event concurrent with emplacement of the anorthosite-gabbro-syenite complex apparently did not involve regional metamorphism or significant deformation of upper plate rocks, and was likely limited to granulite facies contact metamorphism accompanying intrusion (Ehlig, 1981).

The Precambrian sequence has, in turn, been intruded by the compositionally zoned Lowe Granodiorite (Figure 4), dated at 220 ± 10 MYBP (Silver, 1971). Ehlig (1981) has interpreted this intrusion also be a laccolith-shaped body which has been subsequently tilted northeastward such that its base is exposed along a sharply defined, steeply inclined western margin. The Lowe Granodiorite has been affected by metamorphism ranging from lower to upper amphibolite facies, enhancing original foliation and modifying igneous textures by granulation and recrystallization. This intrusive body has been interpreted to have been formed from the partial melting of subducted Pacific plate oceanic crust (Joseph, et.al., 1978; Ehlig, 1981).

Upper plate basement rocks south of the South Branch of the San Gabriel fault in the southwestern San Gabriel Mountains, adjacent Verdugo Mountains (Figure 4) and San Rafael Hills (west of Figure 4), include dolomitic marble, quartzite and schist that have been incorporated into gneiss, migmatite and Cretaceous-age intrusive rocks. These metasediments, estimated to be Paleozoic in age (Oakeshott, 1958), were likely deposited over the Precambrian core rocks in the interior of the San Gabriel Mountains and subsequently deformed and metamorphosed during emplacement of Cretaceous rocks (Ehlig, 1981). This basement underlies most of the eastern project property and includes rock units mapped by Miller (1931; 1934) (e.g., Placerita Formation, Rubio Diorite, Echo Granite) and described in Oakeshott (1958).

All of the upper plate rocks described above have been intruded by Cretaceous-age plutons ranging in composition from quartz diorite to quartz monzonite. These rocks postdate all metamorphism except that associated with the Vincent thrust event.

Lower Plate Rocks: Lower plate basement rocks of the San Gabriel Mountains consist of the Pelona Schist, which occurs in two areally extensive exposures shown in Figure 4 and described above. The Pelona Schist and its related tectonic element, the Vincent thrust, have been correlated with the Orocopia Schist and Orocopia thrust exposed in the Orocopia and Chocolate Mountains, located on the east side of the San Andreas fault about 150 miles southeast of the San Gabriel Mountains (Haxel and Dillon, 1978). The Pelona Schist originated as a sedimentary sequence of well-bedded arkosic sandstone, graywacke, siltstone and claystone that underwent prograde metamorphism synchronous with deep burial and deformation beneath the upper plate of the Vincent thrust (Haxel and Dillon, 1978; Burchfiel and Davis, 1981; Ehlig, 1981). The sequence exposed in the eastern San Gabriel Mountains is over 11,000 feet thick, with some preserved bedding characteristics suggestive of outer-fringe submarine fan and/or basin plain deposition. The Pelona Schist also contains about 10 percent greenschist-facies rocks derived from basaltic tuff, and 1 to 2 percent quartzite derived from chert. Greenschist rocks were likely derived from episodic input of pyroclastic material from a mafic volcanic source, whereas quartz-rich rocks may have originated from chert that slowly accumulated in sediment-starved areas (Ehlig, 1981).

As mentioned above, metamorphism of the Pelona Schist occurred as a cause and effect relationship with the Vincent thrust during movement and deformation along the thrust surface. Based on this relationship, the metamorphic age of the Pelona Schist is approximately 60 MYBP (Paleocene), based upon a rubidium-strontium isochron age of 58.5 ± 4 MYBP obtained from a retrograde schist within the lower part of the thrust zone (Conrad and Davis, 1977). The depositional age of its protolith is unknown. Both the Pelona and Orocopia schists are not known to be intruded by Cretaceous-age plutons, even though such rocks are common in the Vincent thrust upper plate. Ehlig (1981) has suggested that the Pelona Schist sediments need not be much older than the metamorphic age, if the Vincent thrust represents a paleo-subduction zone with thrusting occurring approximately coincident with sedimentation.

Subsurface Basement Rocks: West of San Gabriel basement rock exposures, igneous and metamorphic crystalline rocks have been encountered at depths ranging from 3,500 feet to 10,000 feet in several deep exploratory oil wells drilled in the eastern Ventura Basin. These wells have been drilled mainly northwest of Newhall and south of the San Gabriel fault. No deep exploratory wells drilled north of the San Gabriel fault in the area have encountered crystalline bedrock. Subsurface rock types observed in cores include granite, granodiorite, gneiss, schist and marble (Nelligan, 1978), similar to upper plate, Paleozoic-age basement rocks (e.g., Placerita Formation and related intrusives) exposed in the western San Gabriel Mountains south of the San Gabriel fault. Finally, similar basement rocks have also been encountered in a deep well drilled within the hanging wall block of the Santa Susana fault at Cascade Oil Field (Yeats, 1979), approximately two miles south of San Fernando Pass and the project property.

4.2.2 Cenozoic Sedimentary Sequence

A thick sequence of marine and nonmarine sedimentary rocks was deposited in the western portion of the Transverse Ranges province during Cenozoic time. These strata primarily accumulated within the Ventura Basin, an elongate, east-west trending sedimentary trough southwest of the San Gabriel fault and extending offshore along the Santa Barbara Channel (Figure 5). Although the structurally controlled basin contains Late Cretaceous to Holocene-age sediments, it apparently did not become a well-defined depocenter until about Miocene time. The basin, which developed as a result of crustal stretching and subsidence (Crowell, 1987), has experienced a complex history of subsidence, uplift, erosion and tectonic deformation. The Ventura Basin is also a major petroleum-producing province, with numerous oil fields developed along anticlines, faults, and fault-controlled structures occurring within and along the flanks of the basin.

East of the San Gabriel fault, western Transverse Ranges sediments were deposited in two distinct depocenters, the Ridge Basin and Soledad Basin (Figure 5), and are distinguishable from the Ventura Basin sequence in terms of their original location and sedimentary provenance. Several of the lithologic units deposited within these basins have been correlated to outcrops in the Chocolate Mountains (Ehlig, et.al., 1975), and like the Pelona Schist, are indicative of cumulative right-lateral slip of about 300 miles occurring along the San Andreas fault and San Gabriel fault since late Miocene time (Crowell, 1952; 1954; 1962; 1975; Ehlig, 1981).

The Cenozoic sedimentary sequence deposited within the region of the Ventura Basin is discussed in some detail below, as the project property lies at the eastern end of the basin and contains a thin sequence of these sediments onlapping basement rocks. This is followed by a summary of the Soledad and Ridge Basin Cenozoic sedimentary sections. Pliocene-age and younger deposits of the three basins are collectively discussed in Section 4.2.3.

Ventura Basin Sequence: The Ventura Basin contains a thick, slightly to highly folded and faulted, sedimentary sequence of primarily Paleocene to Holocene-age sediments (Figure 6A). These deposits are underlain by an unknown thickness of Cretaceous-age strata (Nagle and Parker, 1971; Dickinson, et.al., 1984). A substantial portion of the Ventura Basin sequence is Miocene to Plio-Pleistocene in age, with local sediment thicknesses within the basin controlled by differential subsidence and variable sediment input. The central trough of the basin delineated by Yeats (1976) contains a maximum thickness of at least 40,000 feet of strata (Nagle and Parker, 1971). In general, the sedimentation rate was relatively constant for most of Tertiary time, but increased markedly during the Miocene and especially the Pliocene, when the basin subsidence rate significantly increased and over 13,000 feet of Miocene-Pliocene sediments were deposited in the central trough region (Dickinson, et.al., 1987; Childs, et.al., 1984). The eastern Ventura Basin in the Newhall area contains a much lesser thickness of Tertiary sediments, as indicated by subsurface crystalline basement encountered at about 3,500 to 10,000 feet below ground surface in exploratory oil wells drilled in this region (Nelligan, 1978).

In the western onshore portion of the basin, Upper Cretaceous rocks crop out against the Santa Ynez fault to the north, and to the south within the homoclinal sequence of rocks exposed in the Simi Hills (Mesozoic rocks shown in Figure 4). Cretaceous rocks are conformably overlain by a Paleocene and Eocene-age sequence exposed along the north and south basin flanks, and are also present in the subsurface, based on oil exploration data (Figure 7). Areally extensive outcrops of Eocene rocks are present south of the Santa Ynez fault, and extend north of the fault into the southern Coast Ranges Province. The north basin flank section (Figure 7) comprises the Matilija, Cozy Dell, Coldwater and Sespe Formations (lower part), correlative to subsurface Eocene strata present in the central trough region (Figure 6A). To the south, Paleocene and Eocene surface exposures in the Simi Hills are represented by the Calabasas Formation and by marine fine-grained sandstone, siltstone, and claystone of the Santa Susana and Llajas Formations (Yeats, 1979). In the Newhall area, Paleocene and Eocene rocks are also present in the subsurface where Winterer and Durham (1962) reported over 6,000 feet of nonmarine and marine sediments overlying crystalline basement in the Continental-Phillips #1 well (Figure 8), and correlated this section to Eocene rocks exposed in Elsmere Canyon (Figure 6A). Nelligan (1978) indicated the sedimentary section in the Continental-Phillips #1 well to be Paleocene and Eocene in age, and correlated the lower nonmarine conglomeratic portion of the section to either the Calabasas or Santa Susana Formations, and the upper marine interval to the Llajas Formation at Simi Hills.

Late Eocene to late Oligocene-age rocks in the Ventura Basin region are represented by the Sespe Formation (Figure 6A). The Sespe is a thick nonmarine unit typically consisting of reddish-gray sandstone and greenish-gray siltstone and claystone. Like the older Eocene sequence described above, outcrops of Sespe occur both along the north basin flank (Santa

Ynez Mountains northwest of Ventura) and to the south along Oak Ridge and northern border of Simi Valley (Figure 7). The Sespe Formation is up to 3,800 feet thick in the central Ventura Basin, but thins to the east, apparently due to both erosion and intraformational thinning (Yeats, 1979). The closest outcrops of Sespe Formation to the Newhall area occur several miles to the west in the central Santa Susana Mountains south of the Santa Susana fault zone. Several wells drilled in the Newhall area have penetrated an unfossiliferous nonmarine sequence of rocks that do not crop out in the area (Figure 6A, column 2). Winterer and Durham (1962) suggested that these may be correlative to Sespe rocks, but Nelligan (1978) was unable to establish a reliable lithologic correlation of these sediments to any formations in the area, including the Sespe Formation.

Overlying the Sespe Formation is a late Oligocene to Miocene-age marine transgressive sequence of rocks represented by the Vaqueros Sandstone, Rincon Shale, Monterey Formation and Sisquoc Formation (Figure 6A). The Vaqueros is up to 500 feet thick in the central basin trough, and the combined thickness of the Rincon and Monterey siltstone and shale ranges from 3,500 to 4,500 feet in this area. The overlying Sisquoc siltstone-shale sequence was deposited during the period of time when the central trough was at its maximum depth and uplift was initiated adjacent to the central trough.

The corresponding sedimentary sequence in the eastern portion of the basin is stratigraphically higher and younger (Figure 6A), consisting of the Topanga, Modelo and Towsley Formations. The Topanga Formation, which is middle Miocene in age, crops out in the core of the Oat Mountain anticline and is also present in the subsurface beneath the Pico anticline, both located on the hanging wall (north side) of the Santa Susana fault zone approximately three miles southwest of the project property. According to Yeats (1979), the Topanga Formation does not occur south of the Santa Susana fault zone. The overlying Modelo Formation sequence of interbedded siltstone, shale and sandstone is exposed in the core of the Pico anticline south of the Newhall area and is present in the subsurface, where it wedges out to the east against an unconformity developed on unnamed nonmarine rocks (Nelligan, 1978). Outcrops of the overlying Towsley Formation in the Santa Susana Mountains consist of brown weathering siltstone and mudstone with lenticular beds of sandstone and conglomerate. The Towsley conformably overlies and interfingers with the Modelo and is interpreted to be of deep water, turbidite origin in the Santa Susana Mountains, but the unit is primarily a shallow marine deposit toward the east and upsection, where it becomes a siltstone to fine-grained sandstone in the Elsmere Canyon area (Kern, 1973; Nelligan, 1978). The Miocene-Pliocene boundary is interpreted to occur within the Towsley Formation (Winterer and Durham, 1962; Kern, 1973) but cannot be accurately located based on lithology. Kern (1973) assigned most of the Towsley in Elsmere Canyon to the early Pliocene but stated that fauna with Miocene aspects are also present in the section. Nelligan suggested that most of the Towsley cropping out at Elsmere Canyon may be early Pliocene in age (Figure 6B), based on its stratigraphic position with respect to thicker Towsley sections in the Santa Susana Mountains.

Soledad Basin and Ridge Basin Sequences: The Soledad Basin and Ridge Basin (Figure 5) were depocenters for thick sequences of nonmarine late Oligocene to mid-late Miocene-age strata distinct from the Ventura Basin section, due to their location on the northeast side of the San Gabriel fault and different sedimentary provenance (Ehlig, 1981). Large scale displacement and accompanying deformation along the San Gabriel and San Andreas faults occurring in middle Miocene time has displaced these areas from their original location and sediment sources to their present position.

The oldest sediments deposited in the Soledad Basin consist of red beds and fanglomerate of the late Oligocene-early Miocene Vasquez Formation which unconformably overlies Precambrian anorthosite-syenite basement rocks (Figure 6A). The Vasquez Formation is up to 8,800 feet thick, and its lower type section contains approximately 3,800 feet of basalt flows (Oakeshott, 1958). These beds are, in turn, unconformably overlain by the Tick Canyon Formation, a relatively areally restricted fluvial/lacustrine sandstone, siltstone, claystone and conglomerate of Miocene age.

The overlying middle to late Miocene Mint Canyon Formation is unconformable to slightly disconformable on the Tick Canyon Formation in the Soledad Basin, and was also deposited within the Ridge Basin (Figure 6B). The Mint Canyon Formation has been interpreted by Saul and Wootton (1983) to represent a shallow lacustrine deposit. The formation, which is not exposed adjacent to or south of the San Gabriel fault, probably truncates against the fault at depth (Saul and Wootton, 1983). The sedimentary source for Mint Canyon coarse-grained deposits has been correlated to outcrops located on the east side of the San Andreas fault at Salton Wash and the Chocolate Mountains, over 200 miles to the southeast (Ehlig, et.al., 1975; Ehlig, 1981).

The middle to late Miocene-age marine Castaic Formation is unconformable on the Mint Canyon Formation and occurs in both the Soledad and Ridge Basins (Figure 6A). The Castaic Formation is present only on the north side of the San Gabriel fault (Crowell, 1954), and was deposited during marine onlap occurring after deformation and erosion of the Mint Canyon Formation (Saul and Wootton, 1983).

The Towsley Formation represents the oldest stratigraphic unit found on either side of the San Gabriel fault, conformably overlying the Castaic Formation in the Soledad Basin and the Modelo Formation in the eastern Ventura Basin (Figure 6A). However, the Towsley is considerably thinner north of the San Gabriel fault than Towsley deposits occurring south of the fault, and the formation was not deposited within the Ridge Basin. Saul and Wootton (1983) suggested that during its deposition, the Towsley overlapped the active trace of the San Gabriel fault, and variation in grain size and thickness of Towsley beds on either side of the fault trace, near where it crosses SR 14, may indicate some amount of lateral offset of the formation in this area.

The Ridge Basin, a narrow, wedge-shaped, nonmarine sedimentary trough parallel to the San Gabriel fault (Figure 5), contains a distinctive sequence of over 29,000 feet of Miocene and Pliocene-age deposits. Most distinctive of these is the Violin Breccia, consisting of large angular fragments and blocks of crystalline rocks deposited on the downdropped northeast side of an active scarp developed along the San Gabriel fault. The Violin Breccia interfingers with relatively fine-grained and well-bedded lacustrine beds (Ridge Route and Peace Valley Formations) and fluvial sediments (Hungry Valley Formation) of the Ridge Basin Group deposited to the northeast of the fault (Figure 6A) (Norris and Webb, 1976).

4.2.3 Mid-to-Late Pliocene and Younger Deposits

Pliocene rocks were first described and named the Fernando Formation in the Ventura Basin by Eldridge and Arnold (1907), and later divided by Kew (1924) into the Pico and Saugus Formations of the Fernando Group. Further work (Kew 1932; Reed, 1933) redefined the Pico as middle to late Pliocene in age and assigned underlying early Pliocene rocks to the "Repetto Formation". This division was applied in the Placerita Oil Field area by Oakeshott (1950) and Willis (1952). Winterer and Durham (1962) renamed the "Repetto" in Ventura Basin as the Towsley Formation because of the difficulty in correlating these strata to the type Repetto in the Los Angeles Basin, and this nomenclature system was applied in the Elsmere Canyon area by Kern (1973). The historical nomenclature and formation definitions applied to Pliocene-age rocks in the region are summarized below.

Eldridge & Arnold, 1907	Kew, 1924		Oakeshott, 1950	Willis, 1952		Winterer & Durham, 1952; Kern, 1973
Fernando Fm. (middle Pliocene)	Fernando Group	Saugus Formation	Pico Formation	Pico Formation		Pico Formation
Vaqueros Fm. (lower Miocene)		Pico Formation	Repetto Formation		"Repetto Equivalent"	Towsley Formation

Source: Kern (1973)

In the central Ventura Basin, mid-to-late Pliocene and early Pleistocene-age Pico Formation deposits (including Repettian-age rocks) consist of 10,000 to 13,000 feet of deep-water siltstone, interbedded sandstone, and mudstone (Figure 6B). These sediments were deposited during a period of rapid basin subsidence of about 2 millimeters per year (Yeats, 1978).

In the eastern portion of the Ventura Basin, the Pico is thinner but still is indicative of deep-water deposition, as seen in outcrops in the Santa Susana Mountains and in the subsurface in the Newhall area (Yeats, 1979; Nelligan, 1978). The Pico crops out in a large arc pattern around the Newhall area and extends southeast into the Santa Susana Mountains, and east into Elsmere, Whitney and Placerita Canyons. In the eastern basin, the Pico-Towsley contact is conformable, but becomes an unconformity in Whitney and Elsmere Canyons (Winter and Durham 1962; Kern, 1973) (Figure 6B). In these eastern canyon areas, the Pico is coarser grained and contains graded and cross-stratified beds and lenses of medium to coarse-grained sandstone, pebbly sandstone and conglomerate, indicating shallower water conditions and proximity to sediment sources.

Winterer and Durham (1962) considered the Pico to be entirely marine but interfingering and partly coeval with the overlying Saugus Formation (Sunshine Ranch Member), which contains normal marine, brackish water and nonmarine deposits. This is further complicated by conformable and unconformable contacts, locally missing sedimentary section, and local faulting effects. The relationship of the Pico Formation and overlying Saugus Formation in the project region is summarized in the following table and further discussed below.

Oakeshott, 1958		Winterer & Durham, 1962		Saul & Wootton, 1983	
Saugus Fm. (early Pleistocene)		Saugus Fm. (late Pliocene to early Pleistocene)	Upper unnamed mbr.	Upper Mbr. (late Pliocene to early Pleistocene)	Coarse-grained facies
					Fine-grained facies
			Sunshine Ranch Mbr.	Sunshine Ranch Mbr. (Pliocene)	Upper facies
					Lower facies
Pico Fm.	Sunshine Ranch Mbr. (late Pliocene)	Pico Fm. (middle to late Pliocene) marine but upper part interfingers with nonmarine Sunshine Ranch Mbr. of Saugus		Pico Fm. missing in Mint Canyon Quadrangle	
	Upper Mbr. (late Pliocene)				
	Lower Mbr. (middle Pliocene)				

In the geologic report of the San Fernando 15 Minute Quadrangle, Oakeshott (1958) recognized three members of the Pico Formation, with the uppermost unit defined as the Sunshine Ranch Member. It is likely that Oakeshott's Sunshine Ranch Member of the Pico designated in his 1958 report included fossiliferous marine beds of the lower part of the Saugus Formation first defined by Kew (1924). Winterer and Durham (1962) defined the Sunshine Ranch as the lower member of the Saugus Formation, along with an overlying upper member, but did not distinguish these in deposits mapped north of San Fernando Pass. Mapping by Saul and Wootton (1983) north of San Fernando Pass in the Mint Canyon 7.5 Minute Quadrangle followed this definition, and further divided the Sunshine Ranch into a lower sandstone and conglomerate facies (shallow to marginal marine) and an upper greenish-gray siltstone/mudstone facies (nonmarine to brackish/lagoonal) (above table and Figure 6B). The upper member was also divided into a fine-grained facies and overlying coarse-grained facies. As a result of the Saul and Wootton study (1983), some beds that were mapped as Pico by Winterer and Durham

(1962) in the Placerita Canyon area have been subsequently mapped as Saugus (Sunshine Ranch Member or upper member, fine-grained facies). Saul and Wootton (1983) also indicated that the Pico Formation is not present north of the San Gabriel fault, and the Saugus directly overlies Towsley Formation (Figure 6B, column 4).

In the western onshore Ventura Basin, the Pleistocene section consists of the Santa Barbara Formation and overlying San Pedro Formation (Figure 6B). These units are the marine equivalents of Saugus Formation continental deposits present in the central and eastern basin areas. The Saugus Formation is widely exposed in the Newhall area of the eastern Ventura Basin and also north of the San Gabriel fault in the Soledad Basin, outcropping in the bluffs surrounding the Santa Clara River drainage and its tributaries north of the fault. In the southeast quarter of the Mint Canyon Quadrangle north of the project property, Saul and Wootton (1983) divided the Saugus into the two members and four facies shown in the above table. The Sunshine Ranch Member is best exposed in a series of folds parallel to, adjacent and north of the San Gabriel fault. The Upper Member is widely exposed in the west half of their mapping area, and is present both north and south of the San Gabriel fault (Saul and Wootton, 1983).

The Pacoima Formation unconformably overlies Saugus deposits in the Newhall area and the San Fernando area (Figure 6B). In the western Ventura Basin, the middle beds of the San Pedro Formation may be time equivalent, but are lithologically dissimilar from the Pacoima. The Pacoima was first named by Oakeshott (1958) for fanglomerate deposits overlying Saugus and underlying Quaternary terrace deposits in the western San Gabriel Mountains in the Sylmar area and vicinity of Pacoima Dam. In the Newhall area, the formation is found in the vicinity of Placerita Oil Field, consisting of reddish-brown to light brown arkosic sandstone, pebbly sandstone and pebble to cobble and boulder conglomerate. According to Saul and Wootton (1983), the Pacoima does not occur north of the San Gabriel fault where uplift has caused its removal by erosion (Figure 6B, column 4). Oakeshott (1958) indicated the Pacoima Formation to have been deposited in middle to early-late Pleistocene time, based on its stratigraphic position and general lack of evidence of strong deformation that has affected Saugus and older formations.

In nearly all regional basins, late Quaternary terrace deposits unconformably overlie older sediments (Figure 6B). In the western onshore Ventura Basin, terrace deposits are associated with sedimentation along the Ventura River and its tributaries (Rockwell, et.al., 1984). In the Newhall area, terrace deposits can be grouped into two contrasting types: 1) deposits on streamcut benches along the north and south sides of the Santa Clara River and along Placerita Canyon west of Placerita State Park; and 2) areally limited terrace deposits underlying the remnants of an old surface on the north flank of the San Gabriel Mountains from Sand Canyon northeast to the trace of the Pole Canyon fault (Saul and Wootton, 1983).

Holocene alluvium overlies older deposits within the region, occurring most widely as sediments deposited within the Ventura-Oxnard coastal plain area, Santa Clara River valley and its tributaries, and the Simi and San Fernando Valleys. These deposits comprise a variety of surficial materials, including stream channel deposits, colluvium, slopewash, and landslide deposits.

4.3 REGIONAL TECTONIC FRAMEWORK

4.3.1 Introduction to Geologic and Structural Evolution

The geologic and structural evolution of the Transverse Ranges province is complicated by the fact that this province and other land masses located west of the present day San Andreas fault, are considered to be displaced terrains which have been accreted to the North American plate (Nilsen, 1987) (Figure 9). This accretion is believed to have occurred after the inception of the San Andreas transform margin during early Tertiary time. Each component has been juxtaposed against that portion of California east of the San Andreas fault by right-lateral transform motion and a series of complicated plate rotations (Nilsen, 1987). For instance, it has been postulated that the Baja California borderland (includes the southern California Borderland, Santa Monica Mountains, and the Peninsular Ranges) moved northward from its previous position at least 600 miles after Eocene time and before the end of Miocene time (Howell, et al., 1987), and the entire Transverse Ranges block has been displaced hundreds of miles and rotated clockwise up to 90° into its present position (Luyendyk and Hornafius, 1984).

4.3.2 Precambrian to Paleozoic Record

The geology of the Transverse Ranges province and surrounding area can be traced back to Precambrian-age core rocks exposed in the central part of the range and similar

Precambrian-age crystalline basement of the Mojave Desert. These rocks, which contain an incomplete record of successive deformational events and metamorphism occurring during Precambrian time, are considered to be crustal basement blocks and fragments of the North American cratonic plate (Ehlig, 1981). In the Transverse Ranges and Mojave Desert, Precambrian-age crystalline basement is overlain by Paleozoic-age metasedimentary rocks. Similar age sediments and metasediments occur as wall rocks and roof pendants within the Sierra Nevada, and probably also are represented in the Salinian block of the Coast Ranges (Wiebe, 1970). These rocks are considered to be, in part, the metamorphosed equivalents of Paleozoic cratonic shelf-margin to basin transition carbonates and clastics of the Basin and Range province. However, the Precambrian and Paleozoic geologic history of the area is difficult to reconstruct because of later tectonic events and large displacements of coastal California terrains occurring in Cenozoic time.

4.3.3 Mesozoic Geologic Framework

The Mesozoic geologic history of southern California is better understood than the Paleozoic, but is also complicated by later tectonic overprinting, displaced terrains, and missing gaps in the geologic record. Plate tectonic models generally depict an early Mesozoic, complex Japanese-type island-arc margin along the North American plate to the north (Hamilton, 1981), and an early Andean-type margin to the south (Burchfiel and Davis, 1981). During this period, subduction of the Pacific plate beneath the North American plate was initiated, accompanied by development of a magmatic arc inboard of the continental plate margin. The magmatic arc complex is represented in the Sierra Nevada by extensive volumes of Mesozoic-age igneous plutonic rocks, and by a scattered belt of plutons trending across the Mojave Desert. Magmatic arc plutonic rocks also occur west of the present-day San Andreas fault in the Peninsular Ranges batholith, the Salinian block, and Transverse Ranges province. However, these provinces were located well to the south of their present position in the Mesozoic (Nilsen,1987), and their exact alignment within the arc complex is uncertain.

4.3.4 Paleogene Structural Framework

The Paleogene period (Paleocene through Oligocene) in southern California was a time of transition from an Andean-type subduction margin dominating Mesozoic tectonics to inception of transform margin tectonics occurring from about mid-Tertiary to present. Plate tectonic models for the western North American continental margin during this time depict complex interactions among four major plates: the oceanic Kula, Pacific, and Farallon plates, and the continental North American plate. The approximate positions of the Farallon, Pacific and North American plates during Oligocene time are depicted on Figure 10 for general reference (east half of map), with the Kula plate located just off the figure to the northwest. Most tectonic reconstructions indicate subduction of the Farallon plate beneath North America to the south, and northward movement of the Kula plate with respect to North America to the north (Atwater, 1970; Jurdy, 1984). However, the location of the Kula-Farallon-North American triple junction during this time is not well constrained by available reconstructions. Possibilities exist for an early Tertiary reconstruction in coastal California for both right-lateral slip and convergence along the continental boundary, depending upon which oceanic plates were present along the margin (Nilsen, 1987).

Subduction probably continued along the California continental margin throughout the Paleogene, but was likely complex and may have included a significant component of northward translation of coastal terrains, such as the Salinian block (Nilsen, 1987). According to the crustal kinematic model of Howell and others (1987), these coastal terrains, collectively termed the Santa Lucia-Orocopia allochthon (includes the Salinian block and Transverse Ranges), traveled about 1,500 miles northward along the western edge of the North American margin and were accreted to the craton during early Paleogene. Presumably, this accretion occurred some distance to the south, as shown in the approximate locations of Transverse Ranges province and the Peninsular Ranges during the Eocene (Figure 9). Deformation associated with this event occurred in the San Gabriel Mountains and correlative adjacent areas (Orocopia and Chocolate Mountains), where late Cretaceous-early Paleocene thrusting displaced upper plate rocks over Pelona Schist along the Vincent-Orocopia thrust system. There are several proposed mechanisms for this event, involving either northeast or southwest-directed thrusting (Haxel and Dillon, 1978; Ehlig, 1981; Burchfiel and Davis, 1981; Crowell, 1981), but none satisfactorily explain all of the presently available geologic information. Deformation was also occurring in other parts of the Transverse Ranges province as well during the Paleogene, evidenced by thin-skinned thrust faulting and structural control of depositional patterns in the Simi Hills area (Yeats, 1987).

At approximately 29 MYBP (mid-Oligocene), the Pacific plate began to interact with the North American plate (Figure 9), initiating a new system of right-lateral discontinuities that culminated in the formation of the modern San Andreas fault system during late Tertiary (Neogene) (Blake et al., 1978). As the margin between the Pacific and North American plates developed into a right-lateral transform boundary, two triple junctions were formed (the Mendocino triple junction to the north and the Rivera triple junction to the south) at the points where the remaining portion of the Farallon plate was being subducted. These triple junctions migrated north and south, respectively, along the plate boundary as it changed to a right-lateral transform system. The first transform displacements probably occurred along and near the base of the continental slope (Crowell, 1987) and through time reached farther inland into continental rocks of the North American plate.

Regional uplift and crustal fracturing also occurring in the Oligocene led to the formation of highlands and erosion of older strata in uplifted areas, accompanied by development of numerous, narrow fault-bounded basins in which coarse, nonmarine deposits accumulated (Nilsen, 1987) (Figure 10). During this time, redbeds of the nonmarine Sespe Formation were deposited in the Ventura Basin region, although the basin itself had not yet developed as a major depocenter. Nonmarine sediments and interbedded basalt flows of the Vasquez Formation also accumulated within the Soledad Basin during this time in the Transverse Ranges east of the present-day San Gabriel fault. Other areas in the Transverse Ranges probably were emergent highlands and the sources for accumulating sediment.

4.3.5 Neogene Structural Framework

The Neogene (Miocene to Recent) marks the inception of the modern-day tectonic framework of major right-lateral transform tectonics in southern California with the establishment of the San Andreas fault system and other related structural elements. In early Miocene time, the San Andreas transform fault system was a relatively wide belt of subparallel faults which tended to fragment and extend the margin of the North American lithospheric plate (Crowell, 1987). The overall result of this process was the development of deep, irregular basins such as the Los Angeles, Ventura, and San Joaquin. It was during this time that the subsidence rate of the Ventura Basin began to markedly increase, followed later by deposition of a thick succession of late Miocene and Pliocene-age sediments. Tectonic blocks caught between subsiding basins in the regional right-lateral shear system were deformed, and rotated, with some being squeezed upward, while others were stretched and sagged. Concurrent with the northward translation of the Baja borderland was the clockwise rotation of the Transverse Ranges of approximately 90° into its present position (Luyendyk and Hornafius, 1987; Nilsen, 1987).

The modern-day trace of the San Andreas fault and San Gabriel fault evolved in mid-to-late Miocene, with approximately 200 cumulative miles of right-lateral offset occurring along these faults to the present in southern California (Ehlig, 1981). Initially, displacement of about 40 to 50 miles took place along the San Gabriel fault during late Miocene and Pliocene, during which time it formed the main trace of the San Andreas fault near the northeast corner of the present Salton Trough (Ehlig, et al., 1975). It was during this period of major activity on the San Gabriel fault that thick coarse deposits of the Violin Breccia accumulated against the active fault scarp bounding the west side of the Ridge Basin. The modern-day trace of the San Andreas fault developed to the east of the San Gabriel fault during the Pliocene and offset the San Gabriel fault by approximately 150 miles to its present position (Ehlig, 1981). The inception of the San Andreas fault and abandonment of right-lateral movement on the San Gabriel fault approximately coincided with the opening of the Gulf of California and development of the Salton Trough at about 4 to 5 MYBP (Crowell, 1981; 1987). Also at this time, the Los Angeles Basin, which had subsided deeply at about 12 MYBP but was relatively sediment-starved, received a major sedimentation pulse that infilled the basin (Mayer, 1987). Likewise, the Ventura Basin was rapidly subsiding and received large volumes of sediments. To the south new faults developed, such as the San Jacinto and southeastern segments of the Elsinore, fragmenting and offsetting the Peninsular Ranges province (Crowell, 1981).

Within the past several million years in the Transverse Ranges, uplift of the San Gabriel Mountains occurred as a result of compression developed along the bend in the San Andreas fault. The uplift continues to present and is primarily accomplished by south-directed reverse faulting along the southern range margin, broad arching across the interior and uplift extending across the San Andreas fault (Ehlig, 1981).

4.3.6 Contemporary Regional Structural Elements

As discussed above, the modern-day tectonic framework in southern California is a continuation of the right-lateral transform regime initiated in Miocene time. In the Transverse Ranges and the San Gabriel Mountains, the San Andreas fault is the dominant structural element controlling the regional stress distribution among area faults. In this area, northwestward movement of the Pacific plate relative to the North American plate results in north to north-northeastward directed compression along the bend in the San Andreas fault. Compression is distributed over a large area on either side of the bend and relieved, in part, by reverse or left-lateral displacements along other faults in the Transverse Ranges (Yerkes, et al., 1972).

The San Gabriel fault, once a major structural element in this system, now apparently is not directly involved in regional right-lateral displacement. However, investigation of the fault at selected locations in the Saugus-Valencia area found dip-slip, east side down displacement of Recent alluvium (Cotton, 1985), and the CDMG has established Alquist-Priolo special studies zones along the fault trace in this area (CDMG, 1988). That investigation also suggested that some amount of right-lateral offset may have occurred on the fault at this location. Regionally, the San Gabriel fault splits into north and south branches in the eastern San Gabriel Mountains, where the north branch is truncated by the San Antonio fault (Figure 5). The south branch merges with the Sierra Madre fault zone, which is a left-reverse, oblique-slip fault (Proctor, et.al., 1970). Other portions of the San Gabriel fault trace have been warped, bent and rotated subsequent to its abandonment in the strike-slip system approximately 4 MYBP (Crowell, 1981).

Transverse Ranges faults accommodating much of the regional compressive stress are generally east-west oriented, with reverse or reverse-oblique sense of displacement accompanied by uplift of the mountainous terrain of the Transverse Ranges. These faults, shown on Figure 5, include the Santa Monica-Raymond fault zone, Sierra Madre-San Fernando-Cucamonga fault system, Santa Susana fault zone, San Cayetano fault, Oakridge fault, and Santa Ynez fault to the south of the San Andreas bend, and the Pleito fault zone and White Wolf fault to the north of the bend.

A subsidiary set of generally northeast trending faults, including the Transmission Line, Magic Mountain, Pole Canyon, and Agua Dulce faults occur in the San Gabriel Mountains (Figure 5, not labeled). These faults are indicated as pre-Quaternary in age (Jennings, 1975) have been interpreted to have been active primarily in Miocene time (L.T. Silver, personal communication reported in Whitcomb, et.al., 1973). Therefore, they likely are not part of the contemporary structural setting.

The main shock and aftershock series of the 1971 San Fernando earthquake was an example of seismic activity associated with the compressional stress regime of the region. Analysis of the aftershock series focal mechanisms by Whitcomb and others (1973) defined a crescent-shaped main thrust fault surface dipping northeastward from about 35° at the surface to 50° at depth. Data from the 1971 earthquake are also relevant to the San Gabriel fault in terms of its geometry and potential seismic activity. Wesson and others (1974) interpreted the San Gabriel fault to either be truncated or merge with the northeast-dipping fault plane defined by aftershock data. No surface rupture was noted on the San Gabriel fault during the 1971 event.

5.0 LOCAL GEOLOGIC AND STRUCTURAL SETTING

Characterization of the geologic and structural setting of the Elsmere Canyon area is primarily based on site investigation conducted in 1991 (Janes, 1991) and additional investigation performed in 1992. The additional study conducted in 1992 expands upon the 1991 geologic database for the project property, and includes data obtained in adjacent areas during detailed investigation of the Whitney Canyon fault. Information on the local geologic and structural setting also is supplemented by previous geologic mapping in the Elsmere Canyon area, including that conducted by Miller (1931; 1934), Oakeshott (1950; 1958), Winterer and Durham (1962), and Kern (1973).

The crystalline basement complex comprising the oldest rocks at the project property is described in Section 5.1. Overlying basement rock is a sedimentary section of Eocene and upper Miocene to upper Pliocene deposits and alluvium (Figures 6A and 6B, column 5), which is discussed in Section 5.2. Structural elements at the project property and adjacent areas are described in Section 5.3. Detailed discussion of the Whitney Canyon fault is provided in Section 5.4.

5.1 BASEMENT COMPLEX

Approximately 1,000 acres of the Elsmere Canyon area are underlain by igneous and metamorphic crystalline basement rocks (Janes, 1991). The majority of the proposed landfill footprint will overlie these rocks (Plate 1). Although crystalline basement occupies the majority of the eastern project property, these rocks are poorly exposed, with outcrops limited to areas within incised canyon drainages, along roads traversing the property, and other smaller, isolated exposures along narrow ridges, bluffs and cliffs. Most of the area where basement rocks are inferred to occur is covered by soil and dense scrub vegetation. Mapping of basement rocks was also supplemented from subsurface core data and from float material observed at the surface.

Earliest detailed mapping of the crystalline basement rocks in the western San Gabriel Mountains, including the Elsmere Canyon area, was performed by Miller (1931; 1934). He recognized 11 different mappable rock types or groups. Detailed descriptions and petrologic information for basement rocks mapped in the project area are also presented in Oakeshott (1958).

The nomenclature described by Miller (1931) was followed in describing basement rocks within the project boundary. Only three of the 11 rock groups recognized and assigned formational names by Miller were found in large enough outcrops to be recognized (Janes, 1991). These three primary rock types are summarized in Sections 5.1.1, 5.1.2 and 5.1.3. Because of relatively poor exposures, complex intermixing of rock types, and highly migmatized and deformed rock fabrics, basement rock assemblages were collectively mapped as the San Gabriel Formation (Figure 6A, column 5; Plate 1), also using the nomenclature of Miller (1931). Discussion of the rock assemblages comprising the San Gabriel Formation at the project property is presented in Section 5.1.4.

5.1.1 Placerita Formation

The Placerita Formation includes the oldest rocks of the basement complex at the project property. These consist of metamorphosed sedimentary rocks first described by Miller (1931) and later more fully discussed and named in Miller (1934). The type locality occurs within Placerita Canyon, adjacent to the northern project boundary.

The Placerita Formation comprises a variety of metasediments which include argillaceous, calcareous and dolomitic marble, quartzite, graphitic and feldspathic schist, and feldspathic gneiss. These rocks have been interpreted to be of Paleozoic age, based on their occurrence and relationship with both older and younger rocks that have been dated using isotopic age-dating techniques. In the vicinity of the project property, Oakeshott (1958) mapped Placerita-type rocks as pods, roof pendants and irregular masses contained within diorite gneiss, migmatites and schist. Within the project boundary, individual outcrops of metamorphic rocks interpreted to be Placerita-type metasediments were mapped as gneiss, schist and quartzite, or were mapped as undifferentiated metasediments (Janes, 1991; Plate 1). Outcrops are typically a melange of these and other metamorphic rocks which have been intruded by diorite, granite, and various dike rocks. Metamorphic textures typically range from slight foliation to extreme migmatitic deformational fabrics.

5.1.2 Rubio Diorite

The Rubio Diorite of Miller (1931) occurs in the western San Gabriel Mountains as relatively large masses of dark gray to black, medium to coarse-grained diorite with varied degrees of gneissic texture. Similar rock types to the Rubio Diorite were mapped and described as diorite gneiss by Oakeshott (1958), who also included several other rock types under this designation, including massive diorite, metadiorites, and amphibole-biotite schist. Typically at the project property, the Rubio Diorite is intimately mixed with and intruded into other rocks and is, in turn, cut and intruded by pegmatitic granite and aplite dikes (Janes, 1991). The Rubio Diorite is younger than the Placerita rocks it intrudes, but its exact age has not been determined (Janes, 1991).

5.1.3 Echo Granite

The Echo Granite is a medium to coarse-grained, pinkish-gray granite found intimately associated with the Placerita metasediments and Rubio Diorite. Rocks representing this formation are generally massive and only rarely display gneissic banding. Like the other basement rocks, the Echo Granite is intruded by a variety of younger dike rocks (Janes, 1991).

5.1.4 San Gabriel Formation

In the original definition of the San Gabriel Formation (Miller, 1934), Precambrian-age gneiss (which was later identified and named the Mendenhall Gneiss by Oakeshott (1958)), was not distinguished from other rocks and was apparently included within the formation. Oakeshott (1958) demonstrated the Mendenhall Gneiss to have Precambrian affinities and mapped this gneiss only on the north side of the San Gabriel fault. Therefore, the San Gabriel Formation, as used herein, is restricted to crystalline basement typical of outcrops south of the San Gabriel fault and does not include Mendenhall Gneiss or other Precambrian-age rocks present north of the fault (Figure 4). Under this usage, the San Gabriel Formation includes rocks ranging in age from late Paleozoic to late Mesozoic (Figure 6A, column 5).

At the project property, the San Gabriel Formation is characterized by extremely varied assemblages of rocks occurring in highly deformed outcrops. These primarily consist of the rock formations described above but are so intricately intermixed and deformed that the units cannot be readily distinguished as distinct mappable bodies (Janes, 1991). Primary rock units include granite, diorite, schist, quartzite, and undifferentiated metasediments. Over half of the outcrops mapped at the project property consist of granite and diorite similar to Echo Granite and Rubio Diorite, respectively, with gneiss comprising about 25 percent of the total. Metasedimentary Placerita Formation-type rocks, which include quartzite, marble and schist, comprise the remaining 25 percent. In general, granite, diorite and gneiss occur mainly within the northern part of the project property where basement rocks were mapped, including the ridgeline (area of East Firebreak Road) which forms the southeast limit of the proposed landfill footprint (Plate 1). Outcrops of metasedimentary rocks occur throughout the basement complex underlying the project property but are more prevalent within the southeastern area south of the ridgeline and north of the Grapevine fault (Plate 1). This distribution is generally consistent with the outcrop patterns mapped in the area by Oakeshott (1958).

Although a variety of intrusive, cross-cutting and deformational relationships occur among rock assemblages at the project property, the overall geologic relationships among rock types representative of Placerita Formation, Rubio Diorite and Echo Granite are generally consistent with regional patterns and intrusive relationships observed for these formations. For instance, older Placerita-type metasediments have been intruded and deformed by igneous rocks similar to the Rubio Diorite. In addition, outcrop patterns of metasedimentary rocks mapped in the vicinity of the project property by Oakeshott (1958) indicate that these rocks are older remnants and roof pendants that have been subsequently intruded by plutonic rocks. Rock types typical of the Rubio Diorite and diorite gneiss of Oakeshott (1958) intruding Placerita rocks, in turn, are intruded by younger granitic rocks. In many instances, granite has intimately intruded diorite to produce a banded assemblage of diorite, gneissic diorite, granite and gneiss (Janes, 1991). Finally, the entire sequence of basement rocks described above has been further intruded and altered by younger aplite and granite dikes.

The San Gabriel Formation basement complex may display deformational fabrics ranging from weakly foliated to strongly deformed. Foliation is best developed in gneissic and schistose rocks; mapped foliation and schistosity trends typically range from northwest to southeast orientations, with an east-west trend developed in gneiss outcrops within the central part of the project property (Plate 1). Basement complex rocks are also extensively fractured at the surface and at depth. In the subsurface, San Gabriel Formation rocks encountered in cores consist of gneiss, granodiorite, diorite and granite, with lesser amounts of marble and schist. Typically, subsurface basement complex rocks are moderately to highly fractured and sheared and may contain tar and oil within open fractures from near surface to over 200 feet below ground surface in some instances. Further discussion of fractures, joints and other structural features is presented in Section 5.3.

5.2 TERTIARY AND QUATERNARY SEDIMENTARY ROCKS

Sedimentary rocks unconformably overlie crystalline basement rocks and are exposed in the central and western portions of the property. These strata are represented by Eocene rocks, Towsley Formation, and Pico Formation. In addition, a limited exposure of Saugus Formation occurs in the northwest corner of the property, and surficial deposits represented by stream bed alluvium, colluvium and landslides are also present in some areas. These deposits are discussed below.

5.2.1 Eocene Rocks

Eocene rocks comprise the oldest sedimentary strata at the project property. These rocks occur in a limited outcrop belt in the central portion of the project property, along the lower drainage areas of Elsmere Canyon. Eocene rocks are truncated against the Whitney Canyon fault and do not crop out east of the fault trace (Plate 1). Their presence in the Elsmere Canyon area was first documented in the early 1900s (Watts, 1901), and their age was inferred based on lithologic resemblance to other Eocene rocks in the western Ventura Basin region. Winterer and Durham (1962) confirmed the Eocene age with the discovery and identification of megafossils at four localities and foraminifera obtained in cores from exploratory oil wells drilled in the area.

Eocene rocks in Elsmere Canyon generally strike to the northwest and dip at about 40° to 45° to the southwest (Plate 1). The contact with the overlying Towsley Formation is an angular unconformity, with shallower dips in the Towsley generally to the west. In the subsurface, the Eocene section is interpreted to be in fault contact with basement complex rocks along the Whitney Canyon fault (Plate 2, cross-sections A-A', B-B'and C-C'). The thickness of Eocene rocks at the project boundary is not known. However, up to 6,000 feet of Eocene and Paleocene rocks were penetrated in the Continental-Phillips #1 oil well, which was drilled just north of the project property in the Whitney Canyon area on the downdropped west block of the Whitney Canyon fault (Winterer and Durham, 1962; Nelligan, 1978). The location of this well is shown on Figure 12, and on the diagrammatic cross-section shown on Figure 13.

The Eocene sedimentary section exposed at Elsmere Canyon consists of well-indurated, medium-gray to yellowish-gray, medium to coarse-grained sandstone, mottled yellowish-gray siltstone, and lenticular conglomerate beds (Janes, 1991). Most of the section consists of thick (10 to 50 feet) sandstone and conglomerate beds with minor siltstone interbeds. Typically, Eocene rocks are cemented and very hard, forming cliff exposures in the lower reaches of Elsmere Canyon. Lenticular conglomerate beds, consisting of poorly sorted, matrix supported pebble to cobble-size clasts primarily of felsic igneous and some metamorphic and volcanic rocks, crop out in the section exposed in Elsmere Canyon south (Janes, 1991). In the subsurface, Eocene rocks are distinguishable from the overlying Towsley Formation by decreased drilling rates and increased resistivity values on geophysical logs (Janes, 1991). Core samples also show greater dips than those typically observed in the overlying Towsley Formation. Tar commonly occurs along fractures in core samples, and monitoring well C-11 completed in Eocene rocks produces oil and groundwater (Plate 1).

5.2.2 Towsley Formation

The Towsley Formation in the Elsmere Canyon area consists of up to 300 to 400 feet of siltstone, silty sandstone, and very fine-grained sandstone. The Towsley thickens to over 2,500 feet at its type locality in Towsley Canyon, approximately 5 miles west of the project property, and is greater than 4,000 feet thick where exposed along the north flank of the Pico anticline, also to the west (Winterer and Durham, 1962). In the thick western exposures, the Towsley Formation primarily consists of mudstone, siltstone and shale with lenticular sandstone and conglomerate beds which are inferred to have deposited within a submarine fan environment. However, at Elsmere Canyon, Kern (1973) concluded the Towsley Formation was deposited within a nearshore marine environment in water depths of about 50 to 200 feet, based on macrofaunal analysis.

In the Elsmere Canyon area, Kern (1973) divided the Towsley Formation into a lower unit and an upper unit and further distinguished a sandstone-conglomerate tongue of the upper unit. He did not propose these as formal stratigraphic names because of their apparent restriction to only the Elsmere Canyon area. Kern (1973) also mapped up to six different lithotypes within the lower unit and three lithotypes in the upper unit. The two-fold subdivision of Kern was generally followed in mapping the Towsley Formation at the project property (Plate 1). However, the lower unit of the Towsley was considered as one mappable member and the upper member was subdivided into three units identified as Ttu_1, Ttu_2 and Ttu_3 (Janes, 1991; Plate 1 herein). In several studies, the upper contact of the Towsley has been reported to be both unconformable and interfingering with the overlying Pico Formation (Winterer and Durham, 1962; Kern, 1973; Nelligan, 1978), but similar lithotypes of the Towsley and Pico Formations near the location of the inferred contact makes this surface difficult to distinguish in outcrop. For convenience, the upper contact of the Towsley was mapped at the top of the highest siltstone that occurs below coarse-grained sandstone and conglomerate assigned to the Pico Formation (Janes, 1991).

The Towsley Formation unconformably overlies Eocene rocks in the western part of the project property, and to the east, onlaps basement complex where it thins and pinches out against the basement surface. The formation ranges in thickness from less than 50 feet in the southeastern portion of the project property to about 400 feet west of the Whitney Canyon fault. Typically, the Towsley Formation dips about 20° to 25° to the west (Plate 1). Steeper dips and variable attitudes observed in Towsley beds in the southern part of the project property may be due, in part, to landslides and/or local structural effects. Contact with basement rocks, where exposed, is a sharp irregular surface often marked by angular cobbles and boulders of basement rocks contained within basal Towsley sandstone and conglomerate beds. The lower member is typically a massive bedded, fine to medium-grained, well-indurated sandstone. In many areas, this unit is highly petroliferous, with a chocolate-brown appearance on fresh surfaces and numerous associated tar seeps. The lower member was a major target for oil production in the Elsmere area in the 1930s. The lower member also contains several fossil layers, and locally, abundant charcoal fragments and scattered fossilized bone fragments.

The upper member of the Towsley is about 200 to 220 feet thick across most of the project property and is dominated by siltstone. The contact between lower and upper members is gradational, distinguished by an increase in finer-grained beds upward through the section. Three distinct lithologic units of the upper member (Ttu_1, Ttu_2 and Ttu_3) were mapped at the project property (Janes, 1991, Plate 1). The lowermost unit, or Ttu_1, is approximately 70 feet thick and consists of chocolate-brown to olive-gray siltstone with minor fine-grained sandstone layers.

The middle unit of the upper Towsley member, Ttu_2, is a medium to coarse-grained sandstone with lenticular conglomerate interbeds, and averages about 50 feet in thickness. The contact between Ttu_1 and Ttu_2 is marked by a distinct sandstone bed used as a marker horizon in many areas of the project property (Janes, 1991).

The upper unit, Ttu_3, is approximately 100 feet thick and ranges from a fine-grained sandstone in its lower part to a siltstone in the upper part. This unit is thin to thick bedded and commonly contains charcoal fragments. The upper contact with the overlying Pico Formation is a sharp surface between lower siltstone and upper conglomeratic sandstone (Janes, 1991).

5.2.3 Pico Formation

The Pico Formation overlies the Towsley Formation in the west part of the project property and extends beyond the project boundary to the north, south and west. The contact with underlying Towsley deposits, as discussed above, was mapped at the contact of the highest siltstone beds of the Towsley and overlying coarser-grained beds of the Pico. The Pico Formation has been interpreted to be a shallow nearshore marine deposit in the Placerita Canyon, Whitney Canyon, and Elsmere Canyon areas. The Pico is in both unconformable and interfingering contact with the Saugus and Towsley Formations and is highly variable in thickness (Winterer and Durham, 1962). Within the project boundary, the Pico Formation typically dips from about 25° to 40° to the west and northwest.

Where best exposed onsite in the Elsmere oil field area, the Pico was mapped as a lower member and upper member (Janes, 1991; Plate 1 herein). The lower member is a light-gray to grayish-white, very poorly indurated, medium to coarse-grained sandstone with interlayered reddish-brown, iron-oxide stained pebble conglomerate. Conglomerate beds and iron-oxide staining are more common in the lower part of the member. Both trough and planar cross-bedding are common, and individual beds are lenticular and frequently marked by scoured surfaces and local unconformities.

The upper member consists of similar lithotypes but is generally darker in color and more indurated, forming cliff exposures in the northeast part of the project property. Upper member beds also have a higher silt content than the lower member. Bedding is generally planar and locally planar cross-stratified.

5.2.4 Saugus Formation

Saugus Formation outcrops are limited to the extreme northwest corner of the project boundary along the lower part of the Elsmere Canyon drainage at SR 14 (Plate 1). Onsite exposures of the Saugus are light-gray to grayish-brown, medium to coarse-grained pebbly sandstone and conglomerate that may be correlative to the lower sandstone and conglomerate facies of the lower Sunshine Ranch Member of Saul and Wootton (1983). Saugus beds at the project property dip at about 20° to the northwest where exposed along a steep roadcut at SR 14.

5.2.5 Surficial Deposits

Surficial deposits represented at the project property are alluvium, landslide deposits, and minor amounts of colluvium (Janes, 1991). Mapped locations of landslide deposits and alluvium are shown on Plate 1.

5.2.5.1 Alluvium

Mappable alluvial deposits predominantly occur in primary drainages, including Elsmere Canyon North and South. Very thin alluvial deposits, generally less than several feet in thickness, occur in the upper portions of these canyons and in pockets along high relief tributary drainages. Alluvial thicknesses at the project property range between approximately several inches and 20 feet, generally becoming thicker in the lower reaches of the drainages. Maximum alluvial thickness was encountered in boreholes for MW-17 and MW-22 (Plate 1), located in the northwestern extent of the mapped area near the intersection of San Fernando Road and Whitney Canyon (Janes, 1991). Isolated, generally thin alluvial deposits occur in drainages underlain by the San Gabriel Formation.

Alluvial deposits consist of unconsolidated sandy silt, silty sand and gravelly sand, with minor amounts of clay derived from reworked formational material present at the project property. Numerous igneous and metamorphic cobbles and boulders derived from the San Gabriel Formation also occur in the alluvial deposits. Large cobbles and boulders of Eocene-age rocks are exposed at the bottom of the confluence of Elsmere Canyon North and South (Janes, 1991).

5.2.5.2 Landslide Deposits

Sedimentary rocks at the project property have been uplifted and exposed to erosion. Soil creep, slumping, and mass wasting are common in areas where these strata are exposed on steep slopes (Saul and Wootton, 1983). Most of these strata are not well indurated or cemented and are relatively soft, particularly those associated with the Towsley Formation. The greatest number of landslides occur in the western portion of the project property within the upper siltstone member of this formation (Plate 1). Landslides were also mapped within the Pico Formation and Eocene rocks. One landslide was observed on aerial photographs within basement rocks in the central-eastern portion of the project property (Janes, 1991).

Slope failures at the project property consist primarily of rotational landslides, slumps, complex types, translational failures on dip slopes (predominantly in the southern portion of the project property), and to a lesser extent rockfalls (Janes, 1991). The landslides range from approximately a few tens of feet to several thousand feet in width. Small to moderate-size landslides appear to be approximately 20 to 50 feet thick, based on headwall exposures and estimated thicknesses of displaced material. The longitudinal lengths of these slides are typically on the order of several hundred feet. Larger landslides may average more than 200 feet in thickness based on drilling information, with longitudinal lengths of 1,500 to slightly more than 2,000 feet. Re-activated or multiple movements may have occurred in the larger slides (Janes, 1991). Rockfall slope failures, though variable, are generally several orders of magnitude smaller than rotational and translational slides (Janes, 1991).

Landslide topography is generally evident on aerial photographs by one or more of the following features: steep headwalls, an increase in vegetation near the perimeter of the landslide, or increased vegetation in the slide area compared to the surrounding undisturbed area, and/or slightly hummocky topography. Features observed in the field indicated that the rotational landslides at the project property are relatively stable and possibly very old. These features included the absence of fresh scarps and ground cracks, undisturbed vegetation, signs of erosion along the landslide surfaces and head headwall area, subdued topography, and lack of fresh indications of sliding (Janes, 1991). Rockfalls at the project property appear to have occurred more recently than landslide activity and are probably fairly common along fault planes (Janes, 1991).

5.2.5.3 Colluvium

Colluvium is composed of weathered material that has been transported by gravity. A thin veneer of colluvium was mapped at numerous locations within the project property. This material is generally deposited in the secondary, tributary drainages, and transported downstream during periods of runoff (Janes, 1991). Colluvium at the project property typically consists of loosely consolidated material composed of damp to moist, soft to firm, silty sand with clay to silt (EMCON, 1992a).

5.3 LOCAL STRUCTURAL ELEMENTS

Local structural elements discussed in this section include faults at the project property and surrounding area which have been previously described in the geologic literature and can be recognized and mapped on the property as relatively continuous features. Also included are short fault segments not obviously related to larger faults which can be mapped for appreciable distances on the property, folds defined by bedding attitudes, fractures, joints, and lineaments observable on aerial photographs.

Discussion of aerial photographic lineaments is presented in Section 5.3.1, followed by summaries of mappable faults in Sections 5.3.2 through 5.3.5. Other structural elements observable in outcrop and in subsurface cores, including folds, short fault segments and fractures/joints are collectively discussed in Section 5.3.6. Discussion of the Whitney Canyon fault is presented in Section 5.4.

5.3.1 Aerial Photograph Lineaments

Forty-four false color infrared aerial photographs of the project property and surrounding areas were reviewed by Dames & Moore and others (Janes, 1991) to identify and evaluate lineaments that may be indicative of potentially significant geologic structures. The photographs were taken in May 1990, at a scale of approximately 1 inch equals 650 feet (1:7,800). The findings of this review are discussed below. Summaries of lineaments associated with mapped faults at the project property are also included in Sections 5.3.3 through 5.3.6.

In the project property area, four sets of lineaments have been observed that are possibly indicative of discontinuities such as high-angle fracture zones and/or other geologic features. One set consists of relatively prominent and continuous major features that occur across much of the property. Three other sets of lineaments are less prominent and generally consist of discontinuous minor features concentrated in localized areas of the project property.

The most prominent lineament set strikes approximately northwest-southeast and contains both linear and arcuate elements. Lineaments in this set generally coincide with major and secondary drainages, but several were observed to locally cross-cut topography. Numerous springs have been mapped along some of these features. Portions of Elsmere Canyon South are approximately coincident with prominent arcuate lineaments. A narrow, prominent lineament that cross-cuts topography was observed immediately west of monitoring wells MW-6A and MW-6B (Plate 1). This discontinuous feature could be traced for approximately 7,400 feet across the property. The greatest density of lineaments in this set appears to be concentrated in the eastern and central portions of the project property. The average spacing between individual lineaments associated with this set is approximately 350 feet in the east, 600 feet in the central, and 300 feet in the western portions of the project property, respectively.

A second lineament set observed at the project property strikes approximately north-south. These lineaments were observed to occur predominantly in the west-central portion of the property along the trace of the Whitney Canyon fault. However, a single north-south striking lineament was also observed near the eastern perimeter of the project property. Like the northwest-southeast striking lineament set described above, surface expression of lineaments in this set also generally appears to coincide with major and secondary drainages, although a few less prominent features cross-cut topography. The average distance between individual lineaments associated with this set is approximately 400 feet in the west-central portion of the project property.

A third lineament set observed strikes approximately northeast-southwest. Lineaments in this set also generally coincide with major and secondary drainages, although a few also cross-cut topography. The average distance between individual lineaments associated with this set is approximately 300 feet. Lineaments occur predominantly in the eastern and northeastern portion of the project property, and the most prominent lineaments of this set are approximately coincident with Elsmere Canyon North and some of its tributaries.

A fourth lineament set observed at the project property strikes approximately east-west. Lineaments in this set both coincide with secondary drainages and cross-cut topography, and are most prevalent in the northeast and southwest portions of the property. The average distance between individual lineaments associated with this set is approximately 500 feet in the northeast, and 300 feet in the southeast portions of the project property, respectively.

Lineament sets described above were compared to geologic data for the project property (Plate 1) to evaluate their relationship with mapped elements such as geologic contacts, foliation, fractures and faults. Based on this review, lineaments appear to be related to a variety of features ranging in scale and structural significance. When these lineaments represent regional discontinuities, such as faults, they can display widths up to several hundred feet. The topographic expression of these features appears to influence topography and surface drainage patterns.

The most prominent, northwest-southeast oriented lineament set may be the surface expression of a regional fabric of rock discontinuities. As mentioned, many of these lineaments coincide with primary and secondary drainages, and some have been mapped as minor faults on the project property. The north-south oriented lineament set appears to be the trace of structures related to the Whitney Canyon fault. The northeast-southwest oriented lineaments, especially in the vicinity of Elsmere Canyon North, may be the topographic expression of differential weathering along geologic contacts and subparallel fractures. Finally, east-west oriented lineaments may be local topographic expression of fractures and foliation in the San Gabriel Formation basement complex.

Efforts were also undertaken during geologic mapping to evaluate the possible origin and significance of lineaments. In general, ground checking efforts revealed only limited information regarding their origin, indicating that some of these features are likely caused by bedding attitudes, geologic contacts, and subtle differences in soil color and vegetation. Specific correlations of geologic features to observed photographic lineaments are discussed in the following sections.

5.3.2 Elsmere Field Fault A and Fault B

Faults occurring within the project property in the vicinity of the Elsmere and Tunnel areas of the Newhall Oil Field were identified as "Elsmere field faults A and B" in the 1991 report by Janes. The mapped surface traces of these faults are shown on Plate 1. As shown, these structures occur on the western perimeter of the project property and do not underlie the landfill footprint. The existence of subsurface faults in the Elsmere area was first proposed based on separate accumulations of oil in Pico strata at the Elsmere area and Tunnel area of the Newhall Oil Field (Walling, 1934). Later study by Winterer and Durham (1962) depicted these two faults with a similar orientation to their presently mapped configuration (Plate 1) but did not specifically refer to faults in the Elsmere Canyon area other than the Whitney Canyon fault and the Legion fault. In the 1991 California Division of Oil & Gas report (CDOG, 1991), several faults are depicted on two cross-sections through the Elsmere area and the Tunnel area, respectively. Based on these cross-sections, Elsmere field fault A is interpreted to be present in the Elsmere area, where the Legion fault appears to be the main trapping structure, and Elsmere field fault B is interpreted to trap oil at the Tunnel area. The faults are depicted as high-angle dip-slip structures in the cross-sections.

On aerial photographs, the northern mapped portion of Elsmere field fault B appears as short, generally north-south oriented lineaments. In this area, the fault is topographically expressed as a steep east-facing slope, but no evidence of the fault trace mapped in the central portion of the project property is visible on photographs. A potential extension of the Elsmere Field fault B occurs as a less prominent north-south oriented lineament in the southwest portion of the property. On aerial photographs, Elsmere field fault A appears as prominent arcuate to linear traces of northwest-southeast oriented lineaments, similar to that observed for the nearby Legion fault.

A few scattered outcrop exposures of these faults have been located during detailed geologic mapping within the project boundaries. However, at the project property, there is no youthful expression of these faults along the mapped extent of their inferred traces (Janes, 1991), and there is no evidence to suggest Holocene activity on these faults.

5.3.3 Legion Fault

The Legion fault is the northernmost of the south-dipping reverse faults in the Newhall area (Winterer and Durham, 1962). This northwest-trending fault, named for an exposure behind the American Legion Hall about one mile east of Newhall, has a total mapped length of slightly over two miles (Winterer and Durham, 1962). The Legion fault has been mapped on the project property extending from the northwest boundary corner in a southeast to nearly east-west direction to the trace of the Whitney Canyon fault (Plate 1) but does not extend beneath the landfill footprint.

One of the earliest references to the Legion fault was included in Oakeshott (1958), who mentioned an unnamed northwest-trending fault that apparently formed the northwest limit of oil production in the Elsmere area. A cross-section in the 1991 CDOG report also depicts productive Pico beds at the Elsmere area as truncated against the Legion fault. As shown in this cross-section, the fault is a high-angle south-dipping normal fault. However, Nelligan depicted the Legion fault as a high-angle reverse fault in several of his subsurface oil well cross-sections (Nelligan, 1978, sections K-K', O-O'). According to that study, vertical separation across the fault is no more than a hundred feet, based on oil well logs.

On aerial photographs, several prominent arcuate to linear northwest-southeast oriented lineaments appear to coincide with portions of the Legion fault. However, at the surface much of its trace is covered by landslides. Nelligan (1978) indicated that the Legion fault cuts Pleistocene-age Saugus Formation, and, on this basis, the fault is considered to be a Quaternary fault. As in the case for Elsmere Field faults A and B, there is no youthful geomorphic expression of the Legion fault at the project property (Janes, 1991), and there is no evidence to suggest Holocene activity on the Legion fault.

5.3.4 Beacon Fault

The Beacon fault is a northwest-trending, south-dipping reverse fault which cuts across the Newhall Refinery, and is well-exposed in a roadcut along SR 14. The fault occurs on the western property boundary approximately 2,000 feet from the western edge of the landfill footprint. The Beacon fault was named for an exposure near an airway beacon at the head of San Fernando Pass (Winterer and Durham, 1962). The fault plane at the surface dips between 70 and 75 degrees at its western end and decreases in dip toward the east to become a bedding plane fault east of the pass (Nelligan, 1978).

To the west of SR 14 and the project property, the Beacon fault has a prominent effect on the surface geology of the area (Nelligan, 1978). Along a one-half mile section of the fault, gently dipping Pico sandstone and conglomerate are thrust over Saugus beds. In Railroad Canyon, south of Newhall, the fault dips 40 degrees south and has two smaller north-dipping faults in the hanging wall block which juxtapose Pico and Saugus strata. East of SR 14, however, the Beacon fault flattens and becomes a bedding plane thrust, and it can only be traced for about 1,000 feet onto the project property (Plate 1). Likewise, the fault trace is not recognizable on aerial photographs beyond the east side of SR 14 at San Fernando Pass. Since the Beacon fault cuts Saugus Formation, it is considered to be a Quaternary fault; no evidence for Holocene activity has been reported or observed along the fault.

5.3.5 Grapevine Fault

The Grapevine fault is a northwest-trending, north-dipping, high-angle thrust fault located just to the south of the project property. The fault is interpreted to be a part of the system of frontal range faults comprising the Santa Susana-San Fernando-Sierra Madre fault zones, along which uplift of the San Gabriel Mountains has occurred (Oakeshott, 1958; Whitcomb, et al., 1973; Ehlig, 1981). Oakeshott (1958) described the Grapevine fault as a steep thrust fault dipping between 40 degrees and 50 degrees and displacing crystalline basement over Tertiary-age sediments.

The trace of the Grapevine fault is not readily observable on aerial photographs. At the surface adjacent to the southern project boundary, much of its trace is apparently covered by landslides and must be inferred. Where the fault is better exposed along the extreme southern tip of the project boundary, basement rocks are juxtaposed against Towsley and/or

Pico strata (Plate 1). The fault occurs approximately 2,000 feet south of the southern edge of the landfill footprint.

The Grapevine fault probably truncates the north-south trending Whitney Canyon fault in the subsurface (Janes, 1991; also see following Section 5.4). Kern (1973) postulated that the Grapevine fault may have assumed a role as a major structural boundary along the western San Gabriel Mountains in late Pliocene and early Pleistocene time. At present, it is uncertain how the fault may fit into the complex of faults and structures comprising the Santa Susana and San Fernando fault zones. There was no reported surface rupture along its trace during the 1971 San Fernando earthquake, although considerable ground cracking and other surface effects occurred in the general area (Weber, p. 74, and Barrows, et.al., in Oakeshott, 1975). In that event, fault segments of the San Fernando fault zone located approximately three miles to the south of the Grapevine fault ruptured at the surface and apparently accommodated most of the surface displacement (USGS, 1971; Oakeshott, 1975).

5.3.6 Other Surface and Subsurface Structural Elements

As considered herein, other surface structural elements include those features which have been mapped at the project property (Plate 1) exclusive of the faults and their related segments described above. These would include folds, short segments of faults not obviously related to those described in above sections, fractures and joints. In subsurface well cores, these elements include shear planes and possible fault zones, fractures, joints, and to a lesser degree, dip information as available. These are collectively discussed below.

Folds: A series of east-west trending anticlines and synclines was mapped in the area to the south of the southern project boundary (Plate 1). These structures have been exposed in SR 14 roadcuts along the western boundary and were mapped to the east by bedding attitudes. These folds are inferred to terminate against the Grapevine fault and the basement complex as mapped on Plate 1, but this relationship is generally not well exposed. From north to south, this series of anticlines and synclines tends to become steeper, and the southernmost syncline has been overturned toward the south and may merge into an east-west inferred fault at this location (Plate 1).

Collectively, folds along the southern project boundary appear to be related to larger anticlinal and synclinal folds (Pico anticline, Oat Mountain syncline, etc.) mapped to the west in the Santa Susana Mountains by Winterer and Durham (1962, Plate 44). However, folding south of the project boundary is of much smaller amplitude, suggesting that the larger folds in the Santa Susana Mountains die out to the east. Nelligan (1978) indicated that the Santa Susana fold structures die out in the subsurface at the northeast-oriented downstep of Santa Susana fault, which is postulated to be present in the San Fernando Pass area (Yeats, 1979). Nelligan (1978) also suggested that east-west oriented structures in the Newhall area, including the Legion and Beacon faults, were related to regional compression and uplift during movement along the Santa Susana fault zone.

Smaller east-west oriented folds have also been mapped along the western project boundary near the northwest property corner (Plate 1). These are exposed in SR 14 roadcuts but could not be traced very far onto the project property. Divergent bedding attitudes were mapped at a few locations on the project property (e.g., east of boring B-17 and southeast of monitoring wells MW-17 and MW-22, Plate 1). These may be indicative of localized smaller folds, or alternatively, could be of depositional origin.

Fault Segments: Several isolated exposures and short segments of faults not obviously related to other faults described above were mapped at the project property (Plate 1). These features cannot be linked with certainty to longer mapped faults because of their isolated locations and/or their orientation. Although no clearly defined groups exist, these features can be broadly categorized into two sets, based on their orientation and to a lesser degree, their distribution at the project property.

The first set typically consists of short, subparallel northwest-oriented segments generally located within the north-central portion of the project property east of the Whitney Canyon fault (Plate 1). These are confined to the Towsley and Pico sedimentary section, and several subparallel segments were inferred to trend across the area of Elsmere Canyon North. Several other segments of this set were mapped near the trace of the Whitney Canyon fault near field stations #5 and #6 (Plate 4) and may be related splay features.

A second set of fault segments is generally oriented nearly north-south and mainly occurs in the central portion of the project property east of the Whitney Canyon fault (Plate 1). These were mapped as slightly longer segments cutting both basement complex rocks and Towsley deposits. Mapping by Kern (1973) apparently linked these segnents together with a few of the northwest oriented segments into a splay of the Whitney Canyon fault. Another group of north-south trending fault segments was mapped in the southern part of the project property, also to the east of the Whitney Canyon fault (Plate 1). Measured attitudes included high-angle dips to both the east and west. These segments tend to occur in similar alignment with the Whitney Canyon fault but cannot be linked to it with certainty, largely because of poor exposures in this area.

Fractures: Information pertaining to fractures at the project property is based on several data sources, including aerial photographs, field mapping and observations, subsurface core data, and some geophysical well logs. In addition, fracture studies were conducted at selected areas in which a number of fractures were measured and their attitudes collectively plotted to identify possible preferred fracture trends. These areas are shown as FS-1, FS-2 and FS-3 on Plate 1. The measured attitudes and stereogram plots from these studies are presented in the 1991 report, along with boring logs, core descriptions, and geophysical well logs (Janes, 1991).

The distribution and concentration of fractures mapped at the project property were observed to be dependent upon rock type, age and proximity to faulting (Janes, 1991). Fractures occur most frequently in basement complex rocks comprising the San Gabriel Formation, followed by the Towsley Formation and Eocene rocks. In the subsurface, crystalline rocks were typically moderately to intensely fractured, whereas the Towsley deposits, and to some extent Eocene rocks, were less commonly fractured. As a final generalization, outcrops of all rock types adjacent to faults displayed higher concentrations of fractures (Janes, 1991).

Crystalline basement rocks of the San Gabriel Formation are extensively fractured in many outcrops. In these rocks, fractures may be both open (hairline to several millimeters) or healed with a variety of infillings, including silica and carbonate cement, mica, clay, or tar. Within the weathered zone (0 to 60 feet bgs), fractures occur as two main types (Janes, 1991). Most fractures are high-angle and occur throughout basement rocks. Low-angle fractures, subparallel to the ground surface, comprise the second type, occurring most frequently in weathered outcrops. This group also includes fractures typical of highly weathered outcrops in which fractures are less than one foot in length, concentrated, and randomly oriented (Janes, 1991).

Three outcrop areas in the San Gabriel Formation were selected for detailed fracture studies (Janes, 1991). These areas (FS-1, FS-2 and FS-3 on Plate 1) are located in the central part of the project property near the eastern limit of Towsley deposits. A total of 66, 21, and 60 fracture attitudes were measured at areas FS-1, FS-2 and FS-3, respectively, and the data for each area were plotted on stereograms. Based on these plots, no predominant orientation of fracturing was observed, although a weak northeast-southwest trend may be present (Janes, 1991). In general, most fractures were high angle (approximately 60° to vertical), although shallower dips (10° to 60°) were also present in the data sets.

In the subsurface, crystalline basement rocks encountered in cores were typically moderately to intensively fractured. Intensely fractured zones resulted in poor to no core recoveries in some cases. As a general observation, plutonic and metaplutonic rocks were less fractured than gneiss and metasediments. However, some of the fracture surfaces noted along core fragments may actually be foliation surfaces, based on abundant micaceous minerals such as chlorite and biotite. As a second observation, most fractures appeared to be open or partially open, based on core fragmentation and presence of tar material along fracture surfaces. Where bedrock appeared to be weathered, reddish iron-oxide staining was observed along fractures and as coatings on fracture surfaces. In instances where fractures were healed, infilling typically consisted of silica and carbonate cement, secondary mica mineralization (e.g., chlorite), pervasive tar, or less commonly, clay.

Outcrops of sedimentary rocks of the Eocene section and Towsley Formation generally displayed fewer number and density of fractures than crystalline basement, except near faults. As a special case, however, outcrops of Towsley Formation involved in landsliding typically appeared as re-cemented fractured beds, blocks, and chaotic masses. Some outcrops of Eocene rocks contained large open or tar-filled planar fractures (Janes, 1991). In subsurface cores, both Eocene and Towsley strata contained few open fractures. In most cases, existing fractures had been infilled by carbonate and silica cement and also by tar.

5.4 WHITNEY CANYON FAULT

The Whitney Canyon fault (WCF) is a north-south trending fault that traverses the central part of the project property. The inferred trace of the WCF, based on mapping from previous studies, is depicted on Plate 3. Most of the landfill footprint will lie to the east of the fault, with a small portion extending across the fault trace as mapped by Janes (1991; Plates 1 and 4 herein).

In general, the fault is poorly exposed and displays little geomorphic expression, which has led to differences and inconsistencies in mapping of its trace among previous workers (Plate 3). The project investigation included detailed study of the WCF at the project property and adjacent areas. Results of these detailed field studies imply that the fault was previously mapped incorrectly north of Whitney Canyon; a number of hypotheses were evaluated to explain major differences and inconsistencies in mapping of the fault.

Available published and unpublished background information pertaining to the WCF, including the 1991 database (Janes, 1991) is presented below in Section 5.4.1, followed in Section 5.4.2 by a discussion of mapping and trenching investigations conducted in 1992 to further evaluate the location and continuity of the fault and its recency of activity (Appendix B). Section 5.4.3 presents a discussion and overall interpretation of the WCF based on the collective data base.

5.4.1 Previous Studies and Background Information

Some of the early information regarding the WCF is based on subsurface data from oil exploration and production activities in portions of the Newhall and Placerita Oil Fields, and previous mapping by Oakeshott (1950; 1958), Winterer and Durham (1962), Kern (1973), and Saul and Wootton (1983). The fault was first recognized (but not named) in the Whitney Canyon producing area by Walling (1934) and in the Placerita Oil Field by Barton and Sampson (1949). The fault was later named the "Whitney fault" in a publication by Oakeshott (1950).

Oakeshott (1950, 1952, 1958) performed the earliest comprehensive geologic mapping in the Elsmere Canyon area and interpreted the WCF as a north-south trending structure that juxtaposes Eocene rocks on the west against lower Pliocene strata on the east (his Elsmere member of the Repetto Formation; now recognized as Towsley Formation). This relationship was also depicted in later mapping by Winterer and Durham (1962). Other mapping of the fault prior to specific investigations for this project includes study of early Pliocene paleoenvironmental conditions in the Elsmere Canyon area by Kern (1973), a subsurface geologic study of oil well data in the Newhall area by Nelligan (1978), and mapping performed in the south half of the Mint Canyon Quadrangle by Saul and Wootton (1983).

Winterer and Durham (1962) mapped the trace of the WCF for a total distance of about 3-½ miles from about the Grapevine fault northward to the San Gabriel fault (Plate 3), but provided no evidence for locating the fault on their map. The WCF has been interpreted to possibly have been a longer fault in the past that was truncated and offset along the San Gabriel fault (Oakeshott, 1958; Nelligan, 1978). In several subsurface oil well cross-sections, Nelligan (1978) depicted the WCF as possibly being truncated against the dipping surface of the San Gabriel fault.

The termination of the WCF in the vicinity of the San Gabriel fault is not well understood and is complicated by topography and past grading activities for the Antelope Valley Freeway (SR 14). Saul and Wootton (1983) mapped a surface trace of a fault (with a dashed line) which they interpreted to be the WCF to within about 2,400 feet of the San Gabriel fault and inferred that its trace extends northward to about 900 feet of the San Gabriel fault. However, they also mapped at least two other north-trending fault traces in the Placerita Canyon area, and depicted a structurally complex relationship in the area where they interpret the WCF, Placerita fault, and Orwig fault to apparently converge near the San Gabriel fault (Saul and Wootton, 1983, Plate 1A; also see Plate 3 herein). Saul and Wootton provide little data or evidence for mapping the fault in this area. As described in Section 5.4.2, below, results of detailed mapping and trenching conducted in 1992 contradict interpretations shown by Saul and Wootton at Placerita Canyon, and evidence was not found for the Orwig fault as mapped by these authors.

To the south, termination of the WCF also is not well understood. The surface trace of the WCF has been mapped to within about 3/4 mile of the Grapevine fault by Winterer and Durham (1962) and nearly to this fault by Kern (1973), who mapped a northwest-trending segment of the Grapevine fault in this area. The fault may be truncated at depth by the high-angle reverse Grapevine fault (Janes, 1991), which is considered to be part of the complex mountain-front thrust system along the base of the San Gabriel Mountains (Oakeshott, 1958). Kern (1973) postulated that in late Pliocene or early Pleistocene time, deformation along the Grapevine fault was contemporaneous with that along the San Gabriel-Sierra Madre fault zones, and that the Grapevine fault was a major structural boundary in this area of the San Gabriel Mountains.

Prior to 1991, detailed geologic mapping of the WCF at the project property was primarily presented in Kern (1973) (Plate 3). Investigation within the project boundaries by Janes (1991; Plate 1) expanded on this mapping and described the fault trace in greater detail. The northern trace depicted in 1991 database mapping is similar to Kern's (1973) trace and is shown as a single north-south oriented fault trace. There are a few interpretative differences in the mapped trace of the fault on the Janes (1991) map from the southern portion of the fault mapped by Kern (1973). In this area, the more detailed mapping of Janes shows two southwestern trending splays and a discontinuous southeastern trending series of fault segments which may be extensions of the Grapevine fault. Kern also recognized two southeastern splays but mapped the southeastern segments as a more continuous trace.

Based on subsurface oil well information, the WCF plane has been interpreted to dip to the west from about 75° to nearly vertical (Winterer and Durham, 1962, cross-section A-A'; Nelligan, 1978). Trenching in Elsmere Canyon during project-specific investigation measured a 58° west dip on the WCF at this location (see following Section 5.2.4). Somewhat in contrast with these interpretations, Saul and Wootton (1983, Plate 1A; Figure 14 herein) apparently measured an orientation of 85° east along the fault plane in Placerita Canyon. The detailed 1992 investigations included an approximately 1,000-foot long bulldozer scrape across the area where Saul and Wootton showed this measured orientation, and significant faulting was not found in the enhanced exposure.

From previously published information, the timing and nature of displacement along the WCF can be inferred based on truncation of Eocene rocks in Elsmere Canyon and subsurface data from the Continental-Phillips #1 well, located west of the surface trace of the fault. Strata penetrated by this well indicate that several thousand feet of apparent west-side-down dip separation has affected Paleocene and Eocene-age rocks and juxtaposed these strata against basement complex rocks east of the fault (Winterer and Durham, 1962, Plate 45, cross-section A-A'). This relationship is diagrammatically depicted on Figure 8 and Figure 13. The precise age of inception of displacement on the WCF is uncertain but is bracketed as post-Eocene to pre-Pliocene, since Eocene rocks occur only on the downthrown west side of the fault, whereas Towsley Formation occurs on both sides (Oakeshott, 1958; Winterer and Durham, 1962; Nelligan, 1978).

Based on subsurface data from Placerita Oil Field and the Whitney Canyon area of Newhall Oil Field, the WCF is interpreted to have been reactivated during the Pleistocene, resulting in 300 to 400 feet of apparent west-side-up separation of Plio-Pleistocene units, in contrast to the earlier and larger east-side-up dip-slip movement (Walling, 1934; Oakeshott; 1958; Winterer and Durham, 1962; Nelligan, 1978). This change in sense of displacement on the fault can be observed by offset of Towsley, Pico and Saugus Formations shown on Figure 8 and Figure 13. At Placerita Oil Field, a fault postulated by previous authors to be the WCF functions as a seal to trap oil in truncated Pico and Saugus strata on the upthrown west block. In this same area, Saul and Wootton (1983) mapped the WCF cutting Pacoima Formation, as well as the Saugus Formation. They also projected the trace of the fault under Quaternary terrace deposits, but did not map these sediments as affected by faulting (Saul and Wootton, 1983, Plate 1A).

In 1977, the California Division of Mines and Geology (CDMG) prepared a Fault Evaluation Report (FER) for the WCF (CDMG, 1977a) as part of a 10-year program to evaluate faults in the Transverse Ranges with respect to potential Alquist-Priolo zoning under criteria in CDMG Special Publication No. 42 (1973). The FER summarized information available at that time pertinent to the WCF and did not include aerial photograph review or field observations. The FER concluded that the WCF appears to be a Plio-Pleistocene fault that has not been active since before, or sometime during, the late Pleistocene and did not meet the criterion for sufficiently active. The report also stated that there was not enough evidence available to conclude whether or not the fault is well defined.

In summary, two periods of activity can be inferred along the WCF. Greatest displacement occurred during the Tertiary, when the fault may have been part of a longer structural element that accommodated several thousand feet of dip-slip, west-side-down separation. This activity may have occurred during the Oligocene when a significant amount of vertical tectonic adjustment was affecting the region and other portions of southern California (see Section 4.3.4). The later period of activity occurred along the fault as west-side-up, dip-slip and possibly strike-slip displacement which affected strata as young as mid-Pleistocene in age. Most recent activity on the WCF occurred during the Quaternary, affecting strata generally considered to be mid-Pleistocene in age. This is consistent with classification of the WCF as a Quaternary fault by the CDMG (1977a and Jennings, 1975; 1992).

5.4.2 Project Investigation

Project-specific field investigation of the WCF was undertaken in 1991 and 1992 to further map and evaluate the extent and nature of the fault, both within the project property and adjoining areas to the north and south (Janes, 1991; 1992 investigation, as described below and in Appendix B). Although the 1991 project investigation established the character and lateral extent of the WCF at the project property, locations at the property with favorable geologic conditions to more accurately assess most recent displacement along the fault were not found. Therefore, the scope of work developed for investigation in 1992 focused on mapping of the fault trace north of the project boundary to more fully characterize fault traces mapped as the WCF by previous workers and identify potential on- and offsite locations that might provide additional information regarding activity of the fault. The area north of the project property was selected for investigation because published literature suggested a location adjacent to Placerita Canyon, approximately one mile north of Elsmere Canyon, where the trace of the WCF had been interpreted to be present beneath Quaternary terrace deposits (Saul and Wootton, 1983). A discussion of the rationale for and results of the 1992 Whitney Canyon fault investigation is presented in Appendix B. The scope and results of this investigation are summarized below.

The field investigation program included the following major tasks: 1) aerial photograph interpretation and detailed geologic mapping on the project property (including preliminary trenching and enhancement of selected areas and outcrops using heavy equipment) and both north and south of the project property to include the entire previously mapped length of the fault; 2) excavation and geologic logging of an exploratory trench within Elsmere Canyon; 3) excavation and enhancement using heavy equipment of an extensive portion of a hillside along Placerita Canyon where previous workers had depicted the WCF as displacing Saugus Formation and extending beneath unfaulted terrace deposits; and 4) enhancement and geologic logging of a roadcut within Placerita Oil Field. Findings of these tasks are presented below.

Geologic Mapping: The trace of the WCF is not readily identified in the field, as there is very little geomorphic expression of its location. There are few natural exposures of the fault or locations where its trace can be inferred based upon juxtaposition of different rocks or sudden changes in bedding attitude. The trace of the fault is generally not discernible as a continuous linear feature on aerial photographs. Sets of sub-parallel, discontinuous north-south oriented lineaments observed on aerial photographs are roughly aligned with the mapped location of the fault in the west-central portion of the project property.

Dense vegetation, soil cover and landslide debris limit the few exposures of the fault to old roadcuts and excavations or trenches deliberately made in attempts to locate its trace. In many instances during mapping, the fault trace was inferred from possible topographic features of fault-line origin, such as slight breaks in slope or small linear canyons. In other cases, the trace of the fault was mapped by following individual beds or marker horizons for some distance to evaluate possible offset or truncation, or by measuring discordant bedding attitudes within a limited area adjacent to the fault.

The mapped trace of the WCF within the project boundary and adjacent areas is shown on Plate 4. Also provided on Plate 4 are bedding attitudes and a summary of significant relationships observed at key field mapping stations. Stations listed include locations of bulldozer scrapes and trenches to uncover the fault trace. These include Stations #8, #9 and #10 which correspond to trench locations T-3, T-1 and T-2, respectively, shown on Plate 1. Trench location T-3 (field station #8) was logged in detail and is further described below.

As indicated in field station summaries on Plate 4, the appearance of the fault trace is dependent upon particular rock type observed in outcrop. In most instances, where coarse-grained deposits are present, the fault trace is a more distinct feature and typically appears as a zone of iron-oxide stained fractures with local slickensided surfaces indicating lateral or oblique sense of displacement. However, at localities where finer-grained strata are present, the actual trace is generally not exposed. In these cases, the fault location was inferred using geologic data such as bedding attitudes or lithologic units that could not be followed across the inferred fault trace.

Within the general vicinity of the proposed landfill footprint, from about station #6 to station #9 (Plate 4), the WCF has been mapped as a single trace striking approximately north-south and dipping from about 60° to 75° to the west (stations #8 and #9). Although this section is not well exposed, the approximate fault attitude has been defined by trenching at stations #8 and #9, supplemented by geologic mapping and aerial photograph interpretation. The area south of station #9 (outside of the area of the landfill footprint) is covered with thick soils, vegetation, and numerous landslides where the fault has been mapped as two splays which strike more to the southwest.

North of station #6 and the landfill footprint, a north-trending trace of the WCF and several northwest-trending splays were mapped in relatively good exposures along the ridge area between Elsmere and Whitney Canyons (Plate 4, area of stations #3, #4 and #5). The northwest splays display dips ranging from 62 degrees southwest to 66 degrees northeast with no dip direction clearly predominating. In addition, at station #3, a northeast-striking and northwest-dipping fault was observed on a ridge crest between Elsmere and Whitney canyons. None of the fault traces could be followed into Whitney Canyon due to poor exposures and extensive landslides along the south slope of the canyon. Relatively good exposures along the north flank of Whitney Canyon (Plate 4, station #1 and #2) indicate northwest-striking fault traces are present in this area.

In the ridge area between Whitney Canyon and Placerita Canyon (Plate 4), outcrops are rare, and generally no fault exposures were found in oil field roadcuts traversing the ridge. Numerous oil field roadcuts were examined in detail northward from Whitney Canyon over the ridge to Placerita Canyon, and very limited fault exposures were found, despite the excellent exposures afforded by the roadcuts. All of the fault traces observed have a northwest orientation and project to the west of traces of the WCF mapped by previous workers (Plate 3; Oakeshott, 1958; Winterer and Durham, 1962; Saul and Wootton, 1983). The detailed mapping performed in this area during the 1992 investigations did not find evidence to support the existence of the WCF north of Whitney Canyon as inferred by Oakeshott (1958) and Winterer and Durham (1962).

At Placerita Canyon, Saul and Wootton (1983) mapped two fault traces in the area other workers had mapped the WCF. The westerly of the two traces is labeled "Whitney fault" on Saul and Wootton's map (Figure 14), and the eastern fault trace is unnamed. In their cross-section C-C', Saul and Wootton show the western trace to have approximately 150 feet of east-side-up separation and the east trace to have >1,000 feet of west-side-up separation on Pico Formation strata. Both faults are shown in the cross-section to dip steeply to the east. The western fault trace, labeled Whitney fault, was shown not to be present in the Placerita Canyon hillside surface scrape (see below) where Saul and Wootton show an 85° east dip on the fault. The eastern trace is evident in a roadcut along the south side of

Placerita Road, where a minimum of approximately 50 feet of dip separation is indicated by the height of the roadcut exposure.

The mapped extent and attitude of WCF within the limits of the project property generally agree with previously published mapping. However, the trend of the fault is less certain to the south and north from the property. In the northern area, project mapping indicates a more complex geometry than has been previously mapped, and the fault apparently separates into a number of northwest-striking splays. Based on these data, there is some uncertainty as to the location, orientation, and continuity of the WCF north of Whitney Canyon. These uncertainties are further discussed in Section 5.4.3, below.

Elsmere Canyon Trench: The trace of the WCF is not exposed in Elsmere Canyon but can be approximately located based on: 1) interpretation of aerial photographic lineaments; 2) change in orientation of the canyon to north-south, following the inferred fault trace for about 250 feet; 3) outcrops of Eocene rocks and Towsley Formation on opposite sides of the small drainage where the trench was excavated; and 4) presence of an active oil/water seep along the inferred trace. Based on these criteria, an exploratory trench was excavated at the location indicated as T-3 on Plate 1 (Field station #8 on Plate 4).

The WCF was encountered in the trench, juxtaposing Towsley Formation on the east against Eocene rocks on the west, with apparent high-angle reverse, west-side-up separation. A detailed geologic map and log were recorded for the south wall of the excavation and are presented on Plate 5. Shown on the log is a 2 to 3-foot thick clay zone which was observed to be developed between the Towsley Formation on the east and Eocene rocks on the west. This clay zone, which is highly sheared and slickensided with variable orientations, is interpreted to be a shear zone developed along the fault. In addition, a distinctly planar surface is developed along the surface of Towsley rocks, with an attitude of N6°E, 58°W dip. This attitude is consistent with the general trend of the WCF mapped in the area, and the planar surface is interpreted to be a fault plane.

As shown on Plate 5, Towsley and Eocene bedrock are overlain by approximately 7 to 9 feet of alluvium and colluvium. The contact between bedrock and alluvium/colluvium was noted to be an irregular, roughly U-shaped concave upward surface along the drainage axis, and was deepest at the clay shear zone where it appears that the softer clay material has been eroded. Alluvium and colluvium appear to primarily have been deposited by mass wasting/slumping processes, based on lack of obvious bedding or other sedimentary structures and presence of subangular clasts of varying sizes in some of this material. Some of the finer-grained alluvium may also have been deposited by surface water flow after significant precipitation events.

The plane of the WCF cannot be traced upward as a sharp planar surface beyond the U-haped erosional surface developed on Towsley bedrock and adjacent clay shear zone (Plate 5). Above this point, the contact between Towsley siltstone and adjacent alluvium/colluvium is an irregular, poorly defined surface which is oil and tar stained in its lower part. There was no evidence exposed in the trench to indicate that the fault has affected overlying alluvial/colluvial deposits. Several depositional units of alluvium and colluvium appear to be present at this location, which are likely to be late Holocene in age based on their geomorphic setting and mode of deposition.

Placerita Canyon Surface Scrape: Previous mapping of the south-half of the Mint Canyon Quadrangle by Saul and Wootton (1983) projected the trace of the WCF under alluvium within the lower Placerita Canyon drainage, just to the east of SR 14 near the Placerita Canyon Road interchange (Figure 14). They also inferred at least one, and possibly two other splays of the fault trending north and northeast across the canyon drainage. However, these inferred splays cannot be traced south of the canyon, nor can they be shown to actually connect with the WCF where it is mapped to the south (Janes, 1992, personal communication). Saugus Formation outcrops along the flanks of the lower part of Placerita Canyon and Quaternary terrace deposits have been mapped overlying the Saugus at several locations (Saul and Wootton, 1983, Plate 1A; Figure 14 herein).

As part of the project investigation, the south-facing slope of the hill adjacent to the northbound Placerita Canyon Road onramp to SR 14 (Disney property, Appendix B) was scraped and partially excavated using a bulldozer in July 1992 in an effort to locate the inferred trace of the WCF (Figure 14). This location was interpreted to have been a favorable site to further evaluate age of displacement on the WCF based on: 1) oil field data for Placerita Oil Field suggesting subsurface presence of a fault in this area (Barton and Sampson, 1949); 2) previous geologic studies that mapped a fault trace through this area (Oakeshott, 1958; Morrison, 1958; Winterer and Durham, 1962; Saul and Wootton, 1983); 3) an attitude shown on what was interpreted by Saul and Wootton (1983) as the WCF specifically at this location; and 4) presence of geologically youthful Quaternary terrace deposits overlying this fault trace where it was mapped as cutting underlying Saugus Formation.

The hillside surface scrape was approximately 1,000 feet in length and oriented roughly west-northwest along the south flank of the hill. The existing hillside was removed of vegetation, soil cover, and weathered material, and was graded/excavated to an approximate 1.5:1 to 2:1 slope. The height of the enhanced exposure ranged from 30 feet to slightly more than 50 feet. After grading, selected areas were hand cleaned to enhance exposures, and the exposed surface was examined for presence of faulting and/or geologic documentation for lack of faulting (such as continuous unfaulted stratification or contacts between different geologic units).

The upper member of the Saugus Formation was overlain by Quaternary terrace deposits in the western three-quarters of the surface scrape. The contact between these two units was observed to be a subhorizontal to slightly westward-dipping, undulating erosional surface. The contact, which was readily discernible, could be traced horizontally with no observable offset. Some minor scouring and small channelling is locally developed on this erosional surface.

Saugus deposits, comprising most of the exposure, consist of beds of light gray, light brownish-gray and olive green fine-grained sand and silt. Some of the fine-grained sand deposits display planar and trough cross-bedding. Saugus beds appeared to be laterally continuous throughout the length in the scrape, and no indications of apparent offset were visible within these deposits at the time of the initial exposure in July 1992. Fine-grained Saugus beds exposed along the southeast end of the surface scrape display an apparent shallow westward dip, approximately coinciding with the west limb of a small anticline previously mapped in this general location (Saul and Wootton, 1983; Figure 14).

The overlying Quaternary terrace deposits consist of medium brown to reddish-brown, sandy cobble and boulder conglomerate. Terrace deposits are largely clast supported and massively bedded. A light brownish-gray, medium-grained, lenticular sand layer occurs within a limited exposure of terrace deposits in the northwestern end of the scrape. However, this area is within the general vicinity of old oil well installations and may have been disturbed (Janes, 1992, personal communication).

Subsequent to the July 1992 work described above, the Placerita Canyon hillside surface scape was briefly revisited in February 1993. As a result of sheet runoff and erosion during extensive precipitation in January and February 1993, the hillside surface scrape had been significantly enhanced, and several small faults were apparent within Saugus deposits along the eastern portion of the exposure. The traces of these features were thin (less than about 1/8 inch in width), and maximum observed displacement within the Saugus was on the order of 8 inches. Based on their narrow width and small apparent vertical displacement, these faults are considered to be minor in comparison to fault exposures in a Placerita Canyon roadcut located east of where Saul and Wootton mapped the WCF, and the fault exposure in Elsmere Canyon that juxtaposes Towlsey Fromation against Eocene rocks.

No evidence of the trace of the WCF was encountered throughout the length of the hillside surface scrape, and the small faults exposed in the eastern portion of the hillside scrape are not considered to be directly correlative to the faults exposed in roadcuts to the south. Accordingly, the attitude apparently measured on the fault trace by Saul and Wootton (1983) could not be confirmed at this location. Based on the superior exposure afforded by the 1,000-foot long bulldozer scrape, it is concluded that the Whitney Canyon or related faults do not extend through this area, as mapped by Saul and Wootton (1983) and Winterer and Durham (1962).

Placerita Oil Field Roadcut: As discussed above, geologic mapping was conducted northward from the site where previous workers had mapped the WCF to characterize in greater detail the location, character and extent of the fault. This effort essentially covered the known northern extent of the WCF mapped by Oakeshott (1958), Morrison (1958), Winterer and Durham (1962), and Saul and Wootton (1983) (Appendix B; Plate 3). Mapping extended from the north project boundary into Whitney Canyon, Placerita Canyon and across SR 14 into Placerita Oil Field.

A fault interpreted to be the WCF (Morrison, 1958; Saul and Wootton, 1983) is exposed along an oil field road winding along a north-facing hillside within Quigley Canyon at Placerita Oil Field. The trace of this fault can be followed in roadcuts up the hill to where the fault has offset the base of the Pacoima Formation capping the hill (Saul and Wootton, 1983), and where Saugus Formation and overlying Pacoima Formation are juxtaposed along the fault. This location is indicated on Plate 3 and on Figure 14, which is a portion of the geologic map of the south-half of the Mint Canyon Quadrangle by Saul and Wootton (1983).

A detailed geologic log and summary of lithologic units observed at this outcrop are shown on Plate 6. A description of geologic observations at the roadcut is included in Appendix B.

Depicted on Plate 6 are a main trace and subsidiary trace of the fault exposed in the roadcut that show apparent reverse, east-side-up separation of Saugus deposits over Pacoima beds. Saugus Formation exposed at this locality consists of light gray to yellowish-gray, moderately indurated, fine to medium-grained sandstone with pebbly sandstone, conglomerate, and silty claystone layers. Typically, Saugus deposits are thin to thickly bedded and may contain faint lamination and pebble stringers. Pacoima Formation is predominantly mottled, dark yellowish-orange to light yellowish-gray, well-cemented pebble-cobble conglomerate. These deposits are poorly bedded with minor layers and lenses of silty sandstone.

The main fault exposed in the roadcut strikes approximately N5°E and dips 55° to the east. The hanging wall of the main fault displays strong downward drag of Saugus beds, suggestive of dominantly reverse faulting at this location. Apparent dip separation is estimated to be a minimum of 20 feet but cannot be established precisely because of limited exposure. The trace of the subsidiary fault also shows apparent high-angle reverse, east-side-up separation but little observable drag effects (Plate 6). This fault, which is about 1-½ feet to the west of the main fault at the base of the roadcut, diverges slightly from the main trace upward in the exposure and gradually dies out in Pacoima beds. The subsidiary fault likely merges with the main fault below the base of the roadcut, based on the downward convergence of its trace and exposures of only one fault trace in topographically-lower roadcuts down the hill.

The main fault trace depicted on Plate 6 extends upward to approximately two feet below the top of the roadcut, where it was mapped by Janes (1992, Appendix B) to the base of a soil profile developed on Saugus and Pacoima deposits. The soil profile shown on Plate 6 consists of an upper, approximately 10-inch thick layer of dark brown to brownish-black, organic silty sand and gravel. This material is loose, contains a moderate amount of organic debris, and is heavily penetrated by plant roots. The layer is interpreted to represent an "A" soil horizon that has developed at the ground surface. It can be continuously traced across the fault exposure for the entire length of the roadcut. The "A" horizon transitions abruptly downward into an underlying lighter colored horizon consisting of light brownish-gray and yellowish-gray, silty clayey sand and gravel. This layer is less penetrated by roots, exhibits some soil ped development and clay skins along surfaces of gravels and cobbles, and is interpreted to be a moderately developed argillic "B" horizon. The "B" horizon is approximately one foot in thickness and grades downward into relatively unweathered Saugus and Pacoima strata. The "B" horizon appears to be more developed on moderately indurated Saugus strata than on coarser-grained and well-cemented Pacoima beds. The oil field road has been cut into a steep hillside at this location, and the soil profile exposed in the top of the roadcut has been affected to some degree by active erosion and slope degradation.

After preparation of Plate 6, the upper portion of the roadcut was further excavated to evaluate the relationship between the fault plane and soil profile development. In the newly exposed surface, reddish-brown iron oxide stringers and staining, similar to that observed along the fault plane lower in the roadcut, could be traced upward to within a few centimeters of the transitional contact between the "A" and "B" soil horizons. A thin, dark gray clay lens or seam trending subparallel to the fault trace could also be observed within the "B" soil horizon. Both the "A" and "B" soil profiles could be followed across the top of the fault trace, and there was no evidence of offset of the base of the "B" horizon or of the contact between the "A" and "B" horizons.

This exposure was subsequently re-evaluated by Dames & Moore geologists and Dr. Janes. Prior to examination, the exposure was cut back approximately an additional foot beyond previous excavations. In this new exposure, reddish-brown iron oxide stringers and staining, similar to that previously observed, were present along the fault plane. As previously observed, both the "A" and "B" soil profiles could be followed across the top of the fault trace, and there was no evidence of offset of the base of the "B" soil horizon or of the contact between the "A" and "B" horizons.

Relict fault features such as described above that extend upward into the "B" soil horizon can be interpreted to suggest that the soil profile has been affected by faulting. Alternatively, such features can be relicts from faulting of parent material prior to soil profile development. However, where a soil has not developed over a stable geomorphic surface, as is the case for the roadcut exposure, the relationship may be ambiguous, because the soil profile is subjected to continuous erosion and mass wasting processes (such as soil creep). This results in an unstable geomorphic surface and a degradational soil profile. Further west along the roadcut, near the crest of the hill where degradation rates are lower and the surface is more stable, a much more strongly developed argillic "B" soil profile is present. This more strongly developed soil is in contrast to the argillic "B" horizon observed at the fault exposure. As a consequence, the fault exposure may either include only the lower, older part of the "B" soil profile, with the upper portion truncated by erosion, or a less well-developed soil formed on an erosionally truncated surface that could potentially retain relict fault features. Therefore, data from this exposure are considered ambiguous and inconclusive in terms of the relationship between the soil profile and faulting observed at this location.

5.4.3 Discussion

The collective body of previously published data pertinent to evaluation of the WCF contains numerous inconsistencies and contradictions which make identification of the fault location difficult. These occur both between the various published and unpublished reports and geologic maps of the fault (e.g., Oakeshott, 1958; Morrison, 1958; Winterer and Durham, 1962; Kern, 1973; Nelligan, 1978; Saul and Wootton, 1983; CDOG, 1991) and internally within some of the reports as well. Additionally, based upon the detailed investigations of the WCF conducted in support of the EIR/EIS, as described above and in Appendix B, there are a number of inconsistencies between findings of the project-specific studies and published reports and maps. The net result is that previous interpretations of the extent, nature of displacement and timing of movement along the fault, and hence implications to the project, need to be re-evaluated.

A number of geologic hypotheses, or conceptual models, based on the collective geologic data, were evaluated as possible explanations of the behavior of the WCF. An important element of each of the hypotheses considered is field evidence for continuity of faulting from the project property northward to the vicinity of the Placerita Oil Field and San Gabriel fault. As described in Section 5.4.2 under the heading "Geologic Mapping:", despite detailed mapping and observation of numerous oil field roadcuts in the area between Whitney Canyon and Elsmere Canyon, surface evidence for continuity of the WCF northward from the Whitney Canyon area is lacking. A fundamental question that must be considered in any hypothesis or model of the WCF is whether the fault continues northward with: 1) a generally north-south trend north of Whitney Canyon, as postulated based on subsurface oil field data by Oakeshott (1950; 1958) and Winterer and Durham (1962); 2) a more northeasterly strike northward from Placerita Canyon, as suggested in mapping by Saul and Wootton (1983); or 3) a northwesterly trend as suggested from results of detailed project-specific geologic mapping.

Hypotheses considered range from a relatively simplistic model based largely on published literature sources that assumes the WCF is a single fault or narrow zone of faulting that extends continuously across the project property and adjoining areas to the north and south, to a more complex model of fault interaction consistent with elements of mapping by some previous workers (e.g., some aspects of the work of Saul and Wootton, 1983) and findings of project-specific geologic mapping. While multiple minor variations of the models considered could be proposed, the hypotheses considered are believed to represent a reasonable range of geologic interpretations. The geologic model for interpretation of the extent and character of the WCF believed to be most consistent with the collective geologic data is summarized in the following paragraphs. This discussion is followed by a brief summary of other models considered and the reasons for their rejection.

Geologic Model of the Whitney Canyon Fault: The WCF is interpreted to be a generally north-south trending fault with a single surface trace or narrow zone of deformation within the project property, as mapped by Winterer and Durham (1962) and others, and supported by detailed project-specific geologic mapping. Near the southern termination of the fault, outside of the landfill footprint, the fault is interpreted to diverge into two splays with southwesterly trending traces, as shown on Plates 3 and 4.

Northward from the project property, the main trace of the WCF is interpreted to continue with a northerly strike, as shown by Winterer and Durham (1962) in the vicinity of the ridge between Elsmere and Whitney Canyons and prior to a 30° westerly change in strike postulated by these authors. This northerly trend is interpreted to continue northward to the vicinity of Placerita Canyon and continue as the east fault trace mapped by Saul and Wootton (1983) in the roadcut along the south side of Placerita Canyon Road. This trace is the larger of the two faults mapped along the south side of Pacerita Canyon by these authors. The fault is then interpreted to extend northeastward with an arcuate trend as shown by Saul and Wootton (1983) until it is truncated in a complex relationship by the Placerita and San Gabriel faults. As shown by Saul and Wootton, the fault is offset with apparent right-lateral separation approximately 1,000 feet by the Placerita fault and then continues northeastward to the San Gabriel fault. The apparent right-separation across the Placerita fault could also be due to south-side-up dip-slip displacement of the west-dipping

WCF by the Placerita fault, as suggested by Saul and Wootton (1983). The curved (apparently deformed) trace of the east fault on the north flank of Placerita Canyon would be compatible with deformation by right-lateral offset along the Placerita fault. North of the Placerita fault, a fault located to the east of the curved east fault trace located within and paralleling a north-northeast trending canyon is interpreted to be the offset extension of the WCF. This fault segment is, in turn, truncated by the San Gabriel fault.

According to this hypothesis, the fault exposed in the Placerita Canyon Oil Field roadcut is not the WCF proper, although it is likely associated with the complex zone of deformation near the intersection of the Whitney Canyon, Placerita, and San Gabriel faults. The fault exposed in the oil field roadcut is interpreted to be an east-side-up thrust termination of a pie-shaped structural block caught between the San Gabriel and Placerita faults. Westward vergence of this pie-shaped block due to right slip along the San Gabriel fault is interpreted as the driving mechanism for this fault.

Supporting evidence for this model is as follows:

- In the area between Elsmere and Whitney Canyons, no evidence was found during detailed mapping to support the northward extension of the WCF as shown by Winterer and Durham (1962) and others, whereas direct field evidence was found for a northeast oriented fault in the area as well as a number of northwest diverging fault traces.

- At the Placerita Canyon roadcut, the east fault trace exposure mapped by Saul and Wootton (1983) (located about 1,000 feet east of the "Whitney fault") is observed in outcrop to dip to the west with observable drag indicating west-side-up separation at least as great as the height of the exposure. This is compatible with the west-dipping, west-side-up fault observed onsite in the Elsmere Canyon trench to the south and published accounts of the orientation and sense of Quaternary displacement on the WCF.

- In cross-section C-C' of Saul and Wootton (1983), the east fault in the Placerita Canyon roadcut has >1,000 feet of throw on the Pico Formation, whereas the fault labeled as the WCF has only 150 feet of throw. The east fault is clearly depicted as a more structurally significant element in the cross-section.

- In the Saul and Wootton cross-section, the east fault is west-side-up, consistent with Pico displacement from all literature, whereas the fault labeled as WCF and as mapped by Oakeshott (1958) and Winterer and Durham (1962) is east-side-up, inconsistent with the literature.

- The trace of the WCF mapped by previous workers was not present within the Placerita Canyon hillside surface scrape, nor could it be located as previously mapped in the south flank of Placerita Canyon. Presence of several small displacement faults and fractures in the eastern end of the hillside surface scrape is suggestive that a larger structure is located to the east.

- At the oil field roadcut exposure in Placerita Oil Field, the fault mapped at this location as the WCF by previous workers is an east-dipping fault plane with east-side-up sense of displacement. This is inconsistent with the west-dipping west-side-up sense of displacement of Plio-Pleistocene strata by the WCF.

- The Placerita fault has experienced at least 1,000 feet of vertical south-side up displacement (Oakeshott, 1958; Saul and Wootton, 1983) and possibly some right-lateral displacement sympathetic to the San Gabriel fault (Saul and Wootton, 1983). With either mode of displacement, a west-dipping trace of the WCF intersecting with the Placerita fault would have apparent right-lateral separation in map view.

Contradictory evidence for this hypothesis includes:

- Where fault exposures can be found north of approximately Whitney Canyon several faults dip to the east, whereas faults south of this approximate location typically display west dips. This observation contradicts the premise that the WCF or fault zone can be defined in terms of a consistently west-dipping fault plane.

- Previous workers mapped the WCF with a nearly north-south orientation through the areas of Placerita Canyon and Placerita Oil Field. They indicate that the trace of the WCF projects across the Placerita fault and that the WCF truncates the Placerita fault and other related structures.

- There are two fault traces present in the Placerita Canyon roadcut, one dipping to the west and the other to the east, neither of which appear to offset the other. There may be some uncertainty as to which is the main trace that may accommodate the majority of vertical separation seen in the roadcut and depicted in Saul and Wootton's cross-section.

- Winterer and Durham (1962) showed the east fault with east-side-up displacement, which is consistent with the interpretation of Nelligan (1978). However, Nelligan's structure contour map on the top of the Pico Formation (his Plate V) indicates that it is a west-side-up fault, consistent with field observations.

Alternative Geologic Models: In addition to the geologic model for the WCF described above, a number of other working hypotheses were considered during the field mapping and data interpretation stages of geologic studies in support of the EIR/EIS. These models and reasons for their rejection are briefly discussed below.

Single Continuous Trace Model - This hypothesis is the most simplistic model considered and is based upon published literature and maps. The model assumes that the WCF is a west-dipping continuous fault zone with a north-south trace that extends from the Grapevine fault on the south to the San Gabriel fault on the north, essentially as mapped by Oakeshott (1950; 1958) and Winterer and Durham (1962). This model also assumes no segmentation of the fault and therefore a uniform displacement mode and history along its length. This model is not considered to be representative of the WCF because:

- The trace of the WCF mapped during the project investigation (and also by Kern, 1973) is more complex in areas north and south of the project property than previously depicted. In these areas, the fault appears to branch into two or more divergent splays.

- In the ridge area south of Whitney Canyon, the location of the WCF as mapped by Oakeshott and Winterer and Durham does not agree with results of project mapping.

- On the project property, the WCF is a west-dipping structure with west-side-up relative vertical displacement. At Placerita Oil Field roadcut (oil field roadcut exposure), the fault exposed in the roadcut is an east dipping structure, with east-side-up vertical separation. If both faults are exposures of the WCF, the premise of the model is contradicted.

- At Placerita Oil Field, the WCF defined by the literature is interpreted to trap oil by west-side-up displacement along the fault. At Whitney Canyon area, the trap is interpreted as an east-side-up structure (CDOG, 1991).

- The trace of the WCF mapped by previous workers was not present within the Placerita Canyon hillside scrape. The location of the apparent measured dip of 85° to the east shown in the Saul and Wootton (1983) map, could not be found before or after scraping of an extensive portion of the hillside at this locality.

Segmented Fault Model - This model also assumes that fault traces mapped by Oakeshott, Winterer and Durham, and Saul and Wootton are part of the WCF. However, this hypothesis differs from the previous model in that a fault segment boundary is inferred to exist at approximately the Whitney Canyon area. Major displacement along the fault would have occurred as post-Eocene, east-side-up dip separation, as postulated by previous workers. Reactivation of the fault offsets Plio-Pleistocene deposits by west-side-up and/or left-lateral displacement, in reverse sense to earlier displacement, also consistent with published literature. Discontinuities along the fault cause segmentation with resulting variable types and amounts of displacement along the fault. This model is not favored because:

- Other than a 30° change in strike of the WCF as mapped by previous workers between Elsmere and Whitney Canyons, there is not a strong basis to infer a segment boundary at this location. Also, it is difficult to envision a fault with total length of only 3-½ miles as mapped by Oakeshott (1958) and Winterer and Durham (1962), that is structurally and tectonically segmented.

- The fault at the Placerita Oil Field roadcut displays apparent east-side-up vertical displacement and does not fit the published interpretations based on subsurface data of a west-side-up oil trapping mechanism at Placerita Oil Field.

- Differences in sense of separation between the Placerita Oil Field roadcut exposure and data from the southern portion of the site would require either a scissors-type fault mechanism (which is kinematically very unlikely) or a strong component of strike-slip faulting. Although Oakeshott (1958) has depicted the WCF as having a left-lateral component, its orientation is 90° from the dominant east-west trend of left-lateral faults that occurs in southern California and is inconsistent with faulting mechanisms that can be envisioned for a north-south trending structure within the current tectonic regime.

- Where outcrops can be found, segments of the WCF north of approximately Whitney Canyon primarily dip both to the west and east, whereas segments south of this approximate location typically display west dips. Although this supports the idea of segmentation along the fault, it contradicts the premise that the WCF or fault zone can be defined in terms of a consistently west-dipping fault plane.

- The model fails to consider the complex pattern of faulting near the northern termination of the WCF and the role of the Placerita and San Gabriel faults.

Northwest-diverging Fault Model - This hypothesis assumes the WCF strikes northwest from Whitney Canyon and crosses the Antelope Valley Freeway (SR 14) near its intersection with Placerita Canyon, to the south of the Placerita Canyon surface scrape. According to this model, the WCF would be located within the area of the Placerita Oil Field west of Sierra Highway. This model is consistent with field evidence from the detailed project-specific studies for northwest-striking fault traces along the ridge between Elsmere and Whitney Canyons and on the north side of Whitney Canyon. Although this model is consistent with field evidence that bears on the complex nature of faulting in the area north of Whitney Canyon, it is not considered a likely interpretation because:

- Numerous producing oil wells occur in the area of the Placerita Oil Field that would be located east of the WCF according to this model. This directly contradicts published interpretations of the trapping mechanism for oil accumulation in this field.

- The model does not consider the fault exposures mapped by Saul and Wootton (1983) and during detailed field mapping in support of the EIR/EIS along the south side of Placerita Canyon, particularly the east fault shown by Saul and Wootton to have > 1,000 feet of vertical displacement on Pico strata.

- This model does not consider or explain the fault exposed in the Placerita Oil Field roadcut.

Summary of Geologic Hypotheses: In general, the geologic hypotheses presented above range from a relatively simplistic model based largely on literature and data available prior to project investigation to more complex models that attempt to incorporate both project-specific information and verifiable data from publications by previous workers. The available data regarding the structural geologic relationships along the WCF are not sufficient to conclude (i.e., "prove") which of the four alternate hypotheses presented above, if any, are correct. Although the Segmented Fault Model and Northwest-diverging Fault model are both consistent with much of the available data, the hypothesis developed and described in this document appears to be more consistent the available geologic data, including both information obtained during project-specific investigation and published mapping and reports by previous workers.

Specific factors that influence preference for this model over other hypotheses considered include:

- There is a lack of continuity of mapped fault traces northward from the Whitney Canyon area, despite excellent exposures afforded by numerous oil field roadcuts in the area.

- There is not a fault present in the Placerita Canyon surface scrape where the "Whitney fault" was mapped by Saul and Wootton (1983) as extending northwestward from this location to the Placerita Oil Field roadcut exposure.

- The direction of fault dip and reverse character of displacement documented in the Placerita Oil Field roadcut exposure differs from that presented in all published accounts of the WCF and documented during the project-specific field investigations.

- The preferred model takes into account the complex structural relationships adjacent to the San Gabriel and Placerita faults.

Recency of Faulting: Several lines of evidence obtained during the project-specific field investigation bear on the recency of faulting along the WCF. From evidence obtained onsite in the Elsmere Canyon trench, the earliest age of faulting observed post-dates deposition of the Pliocene-age Towsley Formation. Recency of faulting at this location is constrained to pre-date deposition of the alluvial/colluvial deposits that overlie the Eocene rocks and Towsley Formation. Materials by which these unfaulted deposits could be dated were not found during the field investigation, and based upon their geomorphic location and environment of deposition, they are inferred to be late Holocene in age.

Based upon evidence for displacement of strata of mid-Pleistocene age from both subsurface interpretations and surface geology, the WCF is considered to have been active during the Pleistocene epoch of the Quaternary. There is no evidence for Holocene-age displacement along the WCF within the project property. Based on unfaulted alluvial/colluvial deposits in Elsmere Canyon, most recent displacement along the fault must be pre-late Holocene in age. Due to ambiguity in the soil/fault relationships at the Placerita Canyon Oil Field roadcut, conclusions regarding recency of faulting can not be drawn from this exposure. On the basis of the collective data available from published sources and project-specific investigations, the WCF is considered to be a Quaternary fault, consistent with the CDMG's most recent classification (Jennings, 1992).

5.5 SOILS

Soils mapping information for the project property includes: 1) soils mapping of public lands within the Angeles National Forest (ANF) performed by the United States Forest Service (USFS) (U.S. Department of Agriculture (USDA, 1991); and 2) earlier soils mapping of private lands conducted by the Soil Conservation Survey (SCS) from 1960 to 1967 (USDA, 1970). In addition, partial coverage of the project property is provided in a third soils report and general soils map of Los Angeles County issued by the SCS in 1967, and revised in 1969 (USDA, 1969). The three surveys are compatible in terms of boundaries of mapped soil units, and they generally contain similar soil information and descriptions. The approximate soil boundary locations recognized at the project property are shown on Figure 11.

In the survey conducted by the USFS (USDA, 1991), soils were evaluated with specific objectives and considerations pertinent to National Forest Land, such as watershed protection, range production, wildlife habitat, recreational use and forestry management. In contrast, the 1970 survey of private lands (USDA, 1970) focuses upon land-use and management of privately-held lands primarily in terms of agricultural use, but also including non-farm uses such as highways and land development projects. Due to these differences in purpose, there are some differences in the approach and criteria used for the mapping of soils units between the two surveys. The following discussion of soils at the project property is based upon information contained in both surveys.

5.5.1 National Forest Land Mapping

In the soils survey of ANF land (USDA, 1991), soils were classified using a six category system. Beginning with the broadest these, categories are: order, suborder, great group, subgroup, family, and series, as shown in Table 1. The soils were mapped at the family level or a higher taxonomic level. Fourteen mapping units consisting of several individual soils with similar parent rock material and soil temperature regimes were recognized in the survey (USDA, 1991). These typically are made up of one or more dominant family types and several soils of minor extent.

At the detailed mapping level, a variety of criteria were used to define 68 individual soils mapping units (USDA, 1991). Detailed soils mapping units were identified and categorized in terms of: 1) descriptive definitions that include unit components (mostly soil families) and their proportions, landscape position, and typical vegetation; 2) soil profile description (surface layer, subsoil, substratum); and 3) soil properties and management interpretations. The detailed units provide information that can be used to determine suitability and potential of a soil for specific uses and can also be used to plan the management needed for those uses. Pertinent to the discussion of soils at the property presented in this section are soils engineering and physical properties, which have been summarized in Table 2. These include the following properties and rating systems defined by the USDA (1991):

- **Hydrologic soil group:** These groups are used to estimate runoff from precipitation. Soil groups established according to the intake of water when they are thoroughly wet and receive precipitation from long-duration storms. Four groups (A through D) are recognized, ranging from low runoff potential to very high or rapid runoff potential.

- **Permeability:** This characteristic is the quality that enables soil to transmit water or air, measured as the number of inches per hour of water that moves through the soil. These are described in terms ranging from very slow (less than 0.06 inch) to very rapid (more than 20 inches).

- **Maximum erosion hazard:** This property is described in terms of an Erosion Hazard Rating (EHR) system that evaluates the potential for land-use activities to cause erosion rates to exceed natural soil erosion or soil formation rates. The EHR system incorporates many interrelated factors to determine whether land-use activities would cause accelerated erosion and to what degree accelerated erosion would cause adverse effects. It is designed to appraise the relative risk of accelerated sheet and rill erosion, and does not rate gully erosion, dry ravel, wind erosion, or mass wasting. The risks and consequences for erosion hazard ratings are given in descriptive adjectives such as low EHR or very high EHR.

- **Erosion factor K:** This characteristic indicates the susceptibility of a soil to sheet and rill erosion by water. It is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. The higher the K value, the more susceptible the soil is to sheet and rill erosion by water. Numerical erosion factor K values were listed for soils included in the SCS Soil Survey of Angeles National Forest Area (USDA, 1991). Erosion factor K values for soils on land outside the National Forest Land were descriptive and ranged between low and very high (USDA, 1970).

- **Drainage class:** This property refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation, but may also be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized, ranging from excessively drained to very poorly drained.

- **Soil Manageability:** Soils within the Angeles National Forest were classified according their soil manageability. Certain features of the land affect the relative ease of management with mechanized equipment. Soil manageability classification rates soil and their topography on the basis of features that reduce the ease of equipment operation and features that increase the need for soil protection measures. Soil manageability classes are the ratings that are applied to the individual components of a soil map unit. Soil manageability classes are represented by the numerals 1 to 4. Class 1 is the easiest to manage and class 4 is the most difficult. Letter symbols are added to classes 2, 3, and 4 to identify specific soil problems affecting management.

- **Limitation Rating for Allowable Soil Pressure:** Soils included in the 1970 SCS Soil Survey were rated for allowable soil pressure. Soils were classified on their ability to withstand pressure imposed on them by foundations, as defined in the Unified Building Code, 1967, Ed., Vol. 1, Sec. 2804. Three soil limitation descriptors are utilized based on the soil's texture and its consistence when dry. The three limitation descriptors are slight, moderate, and severe.

- **Road Location:** Features that adversely affect the location of roads include a high water table, soil texture, steep slopes, shrink-swell potential, and depth to bedrock or hardpan. These features were discussed in the 1970 SCS soil survey for soils located on private land within the site.

- **Engineering Classification of Soil:** One system utilized by the American Association of State Highway Officials (AASHO) classifies soils into seven principal groups. The groups range from A-1 (gravelly soil having high bearing capacity, the best soils for subgrade) to A-7 (Clayey soils have low strength when wet, the poorest soils for subgrade). Within each group the relative engineering value of the soil material is indicated by a group index number. Group index numbers range from 0 for the best materials to 20 for the poorest.

Two detailed soils mapping units, the Caperton-Trigo, granitic substratum-Lodo soil families complex and the Trigo-Modesto-San Andreas families complex, are recognized on the portion of the project property within the Angeles National Forest (USDA, 1991). These units are discussed below and selected soils properties are summarized in Table 2.

Caperton-Trigo, granitic substratum-Lodo soil families complex: The Caperton-Trigo, granitic substratum-Lodo soil families complex is the most common soil unit within ANF boundaries of the project property and covers over 60 percent of the total project area (Figure 11). This soils unit consists of 45 percent Caperton family soils, 25 percent Trigo family, granitic substratum and 15 percent Lodo family material. The remaining portion consists of minor components of rock outcrop, Chilao family soils, and warm-type Haploxerolls. The soils unit is typically developed over metamorphic and igneous intrusive basement complex rocks (San Gabriel Formation), and its extent approximately corresponds to the mapped area of the basement complex at the property (see Plate 1). These soils are found on slope angles of 50 percent to 85 percent and consist of sandy to gravelly loam. Depth of these soils ranges from three to 20 inches, with a surface layer ranging to 17 inches, a 3 to 17 inch thick subsoil and approximately 17 inches of highly weathered gneissic, granitic or hard fractured schist. The erosion hazard of these soils is rated as very high. Soil manageability is classified as very difficult, due to very steep slopes (>60%), high to very high EHR, and soil depths of 10 to 20 inches. Runoff potential is moderate to high, and the erosion factor K is 0.20, which indicates that the potential for sheet and rill erosion is moderate to moderately high. Soil permeability is moderate to rapid, and these soils are typically well to somewhat excessively drained (Table 2).

Trigo-Modesto-San Andreas families complex: The Trigo-Modesto-San Andreas families complex occurs in several areas along the northern edge of the project property encompassing ANF land (Figure 11). This soils mapping unit approximately corresponds to the extent of the sedimentary terrain comprising of the Towsley and Pico Formations as it has been mapped on ANF land (Plate 1). This soils mapping unit is found on slopes of 15 percent to 70 percent and comprises fine to coarse silty loam. Typically, the conglomeratic beds of the Pico are overlain by a yellow-brown sand and gravel soil, with very little silt or organic matter (Janes, 1992, personal communication). The unit is composed of approximately 35 percent Trigo family, 20 percent Modesto family, and 20 percent San Andreas family. The remaining 25 percent is generally minor components of Millsholm, Osito, and Stonyford family soils. Depth of these soils ranges from three to 60 inches. The soil profile of the Trigo-Modesto-San Andreas families complex is typically up to 8 inches in depth, with an 8 to 46 inch-thick subsoil. The underlying substratum generally consists of 16 to 60 inches of highly weathered sandstone, hard fractured schist, or a massive sandy loam. These soils are rated as high to very high EHR. Soil manageability is classified as moderately difficult, due to either steep slopes (30% - 60%), and/or high to very high EHR. Runoff potential is moderate to high, and the erosion factor K is 0.32, which indicates that the potential for sheet and rill erosion is moderately high to high. Soil permeability is moderate to rapid, and these soils are typically well drained (Table 2).

5.5.2 Land Outside of ANF Boundaries

The 1970 soils survey of private lands outside of ANF boundaries includes coverage of the west-central and northwestern portions of the project property (USDA, 1970), whereas the previous 1969 report (USDA, 1969) covers the southwestern portion. Like the soils survey of ANF land (USDA, 1991), the 1970 soils survey maps soils both at the general and specific level. However, The 1969 soils survey provides only general soil information.

The general soils mapping unit of the 1970 USDA survey consists of a soil association, which is defined as a landscape that has a distinctive proportional pattern of soils. It normally contains one or more major soils and at least one minor soil. In the survey, sixteen soil associations were recognized on the basis of physiography, including six associations typical of the Mojave Desert region, two on alluvial fans and terraces, and eight on uplands. Soil types mapped at the project property are all associated with an uplands physiographic region (USDA, 1970).

For actual soils mapping, the 1970 USDA survey utilizes soil series as the foundation to define detailed soils mapping units (USDA, 1970). The soil series consists of a group of soils that formed from a particular kind of parent material and have genetic horizons (except for surface layers) that are similar in characteristics and in profile arrangement. Among these characteristics are color, texture, structure, consistency, reaction, and mineralogic/chemical composition. Soil series can have differing surface layer textures, resulting in designation of soil types, which essentially make up the detailed soils mapping units used in the 1970 USDA survey. The survey also recognized a few soils mapping units that were actually soil complexes (intermingled soil types) and undifferentiated soil groups (two or more soils with differences not significantly distinguishable for mapping purposes). Six soil types listed below are recognized on the project property outside the Angeles National Forest (USDA, 1970):

- Gaviota rocky sandy loam
- Millsholm rocky loam
- Saugus loam
- Castaic and Saugus soils
- Ojai loam
- Yolo loam

These soils mapping units are discussed below, and selected engineering properties are summarized in Table 2. In addition, expansive soil information for these units is provided in Table 3.

Gaviota Series: Much of the western portion of the project property consists of soil in the Gaviota series. These soils are found on slopes of 30 to 50 percent and consist of sandy loam. These soils range in depth from approximately 12 to 18 inches, with up to 10 inches of surface material and 4 inches of subsoil underlain by a substratum of hard, coarse-grained sandstone. Outcrops cover approximately 2 to 10 percent of the area. These soils are generally excessively to well drained. Permeability is moderately slow to rapid. Surface runoff is rapid, and sheet and rill erosion are moderate. The erosion hazard of these soils is high. Limitations for road development occur due to steep slopes and hard sandstone at a depth of 14 to 20 inches. These soils are rated as generally good for engineering purposes, such as road base and fill material, by the AASHO engineering classification system, and they have moderate allowable soil pressure ratings (USDA, 1969 and 1970). Gaviota series soil have a low shrink-swell potential (Table 3).

Millsholm series: Soils of this series are also common in the western portion of the project property. These soils are found on slopes of 30 to 50 percent and consist of loam. These soils range from approximately 12 to 18 inches in depth. In a typical profile, the surface layer is a pale-brown loam about 6 inches thick, underlain by a brown heavy loam about 10 inches thick. The underlying substratum is generally a hard shattered shale or fine-grained sandstone parent rock. Outcrops cover approximately 2 to 4 percent of the area. Surface runoff is medium to rapid, and sheet and rill erosion are moderate. These soils have a high EHR. Soil permeability is moderate, and the soils are generally well drained. Limitations for road development are steep slopes and hard sandstone and shale at depths of 20 to 40 inches. These soils are rated as fair for engineering purposes according to the AASHO engineering classification system and have moderate allowable soil pressure ratings (USDA, 1969 and 1970), with a moderate shrink-swell potential (Table 3).

Saugus series: These soils are found in the northwestern and western portion of the project property and consist of loam. These soils are found on slopes of 30 to 50 percent range and in depth from approximately 36 to 60 inches. A typical soil profile consists of about 15 inches of grayish-brown loam at the surface, underlain by a poorly developed loam subsoil and weakly consolidated gravelly sand and shale parent rock. Surface runoff is rapid, and sheet and gully erosion can be high. The erosion hazard of Saugus soils is rated as high. Permeability is moderate, and the soil is generally well drained. There are not any adverse features listed for road location in this material; it is rated as generally good for engineering purposes by AASHO, and has moderate allowable soil pressure ratings (USDA, 1970). These soils also have a low shrink-swell potential (Table 3).

Castaic and Saugus Series: A small area in the western portion of the project property consists of intermixed Castaic and Saugus soils. These soils are found on slopes of 30 to 65 percent and consist of silty, clayey loam. Saugus soils are similar to that described in the preceding paragraph. Castaic soils range in depth from approximately 18 to 36 inches. A typical profile consists of about 9 inches of silty clay loam, approximately 15 inches of yellowish-brown silty clay loam and an underlying parent rock of soft shale and sandstone. Runoff is rapid, and sheet and gully erosion are very high. Topography in this soil type is characterized by steep, narrow, incised valleys. During heavy storm events, runoff is heavily laden with silt. The erosion hazard of Castaic soils is very high. This material has slow to moderately slow permeability ratings and is generally well drained. Limitations for siting roads in this material are steep slopes and weathered shale at depths of 20 to 30 inches. This material is rated by AASHO as poor for engineering purposes and has a moderate allowable soil pressure rating (USDA, 1970), with a moderate shrink-swell potential (Table 3).

Yolo Series: A narrow elongate-shaped area in the northwestern portion of the project property consists of Yolo series soils. These soils are found on slopes of 0 to 9 percent and consist of loam. In a typical profile, the surface layer is a grayish-brown loam about 18 inches thick, underlain by light yellowish-brown loam about 36 inches thick. The underlying substratum is generally alluvial material. Permeability is moderate, and runoff is slight to moderate. These soils are generally well drained. The erosion hazard is slight to moderate. There are no adverse features listed for road location. This material is rated by AASHO as fair to moderately poor for engineering purposes and has a moderate allowable soil pressure rating (USDA, 1970). The shrink-swell potential for Yolo soils is moderate (Table 3).

Ojai Series: A small area in the northwestern portion of the project property consists of Ojai series soils. These soils are found on slopes that range from 2 to 50 percent and consist of loam. In a typical profile the surface layer is grayish-brown and brown loam about 25 inches thick. The subsoil is reddish brown and brown clay loam about 28 inches thick. It is underlain by reddish-yellow sandy loam that has lenses of stratified gravelly sandy loam. The underlying substratum is weakly consolidated sedimentary alluvium that contains partially weathered pebbles and cobblestones of mixed origin. Runoff is rapid, and the erosion hazard is high. Permeability is moderate, and these soils are generally well drained. Occasional steep slopes are the primary limiting factors in road siting. This soil is rated by AASHO as fair for engineering purposes, has a moderate allowable soil pressure rating (USDA, 1970), and low shrink-swell potential (Table 3).

5.5.3 USCS Classification of Soils at the Project Property

Between May and July, 1992, EMCON conducted a subsurface investigation at the project property to obtain preliminary site-specific information on the soil and rock units (EMCON, 1992a). The subsurface investigation consisted of seven exploratory borings and twenty-nine test pits. Soils were classified based on the Unified Soil Classification System (USCS). A generalized soils map was compiled by EMCON based on the results of their subsurface exploration and project-specific geologic mapping (Janes, 1991).

In general, soils in the eastern portion of the property were mapped predominantly as silty sand (SM), with isolated areas of silt (ML), clay (CL), and rock outcrop. These soil boundaries generally coincided with the Caperton-Trigo, granitic substratum-Lodo soil families complex and the Trigo-Modesto-San Andreas families complex mapped by the SCS (USDA, 1981). As previously discussed, these soils are typically developed over metamorphic and igneous intrusive basement complex rocks (San Gabriel Formation). Soils in the western portion of the property were classified as silt (ML) with slightly lesser amounts of silty sand (SM) and isolated outcrops of rock. Gaviota-Millsholm and Yolo type soils were predominantly classified as silt with some sandy silt. Saugus type soils were classified as roughly equal parts silty sand and silt, and Ojai and Castaic-Saugus type soils were classified as silty sand with minor amounts of silt. These soils were predominantly underlain by sedimentary rocks of the Towsley and Pico Formations, and Eocene Rocks. Based on the test pit and boring logs, soil thickness ranged between one and nine feet.

5.5.4 Existing Erosion Conditions

As discussed in Section 5.5.1, erosion hazard ratings of soil units mapped at the property range between slight and very high. Sheet and rill erosion resulting from surface runoff also range from slight to very high. The majority of the property is underlain by soils with moderate to very high erosion hazard ratings and moderate to high sheet and rill erosion potential. Slope length and steepness are critical factors that control the velocity of runoff and therefore contribute directly to the potential for sheet and rill erosion. Mass wasting was observed in varying amounts throughout the property on aerial photographs. The most significant erosion was observed in the southeast portion of the site. This area is underlain by Caperton-Trigo, granitic substratum-Lodo soil family complex. The erosion hazard rating of these soils is very high. Erosion was also observed on the slopes of Elsmere Canyon North, which is underlain by Saugus series soils. The erosion hazard rating of this soil series is high; the potential for sheet and rill erosion is very high, and is further increased because of steep topographic gradients within canyon areas. Sheet and rill erosion were also observed along portions of East Firebreak Road (Plate 1) along roads and areas that have been graded for construction of electrical transmission towers. The erosion in these areas appeared to be a result of de-vegetation on moderate to steep slopes.

6.0 MINERAL RESOURCES

6.1 OIL AND GAS DEPOSITS

6.1.1 Regional Oil and Gas Occurrence

The Ventura Basin is the major petroleum producing province in the region. The basin, which extends from the San Gabriel fault west into the Santa Barbara Channel (Figure 5), contains thick sections of slightly to highly folded and faulted, marine and nonmarine sedimentary rocks (see Section 4.2.2), the majority of which are Miocene to Plio-Pleistocene in age. Numerous oil fields have been developed along anticlines, faults, and fault-controlled structures developed within and along the flanks of the basin.

The project property is located in the eastern portion of the Ventura Basin. Two conditions are notable of oil fields in the eastern portion of the Ventura Basin: 1) the main oil fields are adjacent to, or south of, the west-northwest trending San Gabriel fault; and 2) oil fields are generally oriented in a northwest-southeast direction, consistent with the structural grain of the region (Slade, 1986).

Oil reservoirs in the eastern portion of the Ventura Basin occur predominantly in structural and/or stratigraphic traps in Miocene and Pliocene-age sedimentary rocks. Recognized producing formations in the region include: Mint Canyon, Saugus (basal sands), Modelo, Towsley, Pico, and possibly Eocene rocks (Winterer and Durham, 1962; Slade, 1988). Oil fields in the eastern portion of Ventura Basin include: Placerita, Aliso Canyon, Bouquet Canyon, Saugus, Castaic Junction, Castaic Hills, Honor Rancho, Pacoima, and Newhall.

The project property is located within the eastern portion of the Newhall Oil Field, which consists of geologically distinct eastern and western portions, and includes nine separate oil producing areas. The western portion of the field is located on the northern flank of the Santa Susana Mountains, and the eastern portion occurs along the western flank of the San Gabriel Mountains east and southeast of Newhall.

Production in the western portion of Newhall Oil Field is from the north-westward trending Pico anticline. Several faults are associated with this structure and influence accumulations of oil. There are five separate oil-producing areas within the Pico anticline, including

Pico Canyon, Dewitt Canyon, Towsley Canyon, Wiley Canyon, and Rice Canyon. The producing areas are generally located near the axis of the anticline and are typically structurally controlled by faulting.

The eastern portion of Newhall Oil Field is geologically characterized by homoclinal structures of sedimentary rocks which onlap to the east over crystalline basement rocks. The four oil producing areas in the eastern portion of the Newhall Oil Field include: Townsite, Whitney Canyon, Elsmere, and Tunnel (Winterer and Durham, 1962; CDOG, 1991). These producing areas are all associated with faults, such as the Legion fault, Elsmere field faults A and B, Beacon fault, and Whitney Canyon fault (See Sections 5.3.2 to 5.3.4). The Elsmere and Tunnel areas are located on the project property (see Plate 8).

6.1.2 Regional Historic Oil Production

By the 1800s, local Native Americans were using oil and tar collected from natural seeps near the present town of Newhall. Missions began distilling oil from the Pico Canyon area for illuminating purposes in the 1850s. In 1869-70, a spring-pole hole was drilled to a depth of 140 feet near oils seeps on the axis of the Pico anticline in Pico Canyon. The well was reported to have produced from 70 to 75 barrels of oil per day during drilling, but the hole was abandoned after the tools were lost down-hole (Winterer and Durham, 1962).

In 1875, a second spring-pole hole was drilled on the axis of the Pico anticline, with an initial daily production of 2 barrels of 32° gravity oil from a depth of 30 feet bgs. This well is considered to mark the beginning of the California oil industry (Winterer and Durham, 1962). California Star Oil Works Company was created to develop the oil resources in the Pico Canyon area, and built the first oil refinery in California near Newhall in 1876. In 1877, well Pico 4 (Standard Oil Co. of California C.S.O.W. 4) was deepened to 610 feet using steam-driven equipment, marking the end of the spring-pole method of drilling in the area (Winterer and Durham, 1962).

Pacific Coast Oil Company was incorporated in 1879 and began acquiring the holdings of California Star Oil Works Company. A new refinery with greater capacity was built near Newhall, and a two-inch gravity pipeline, the first in California, was constructed from Pico Canyon to the refinery. The Pacific Coast Newhall refinery was closed in 1883, and oil was shipped by rail to their refinery at Alameda. In 1884-85, a combination two- and three-inch gravity-fed pipeline was laid from Pico Canyon to a refinery at Santa Paula, and later extended to the Ventura area where the oil was transported by ship to San Francisco.

Between 1875 and 1900, development of oil resources along the Pico anticline was actively pursued even though the market for oil was limited. Oil exploration began in Dewitt Canyon in 1882-83, in Wiley Canyon prior to 1893, and in Rice and East Canyons in 1899. Development outside the Pico anticline area began in the Elsmere area in 1889, in Whitney Canyon area in 1893, and in the Tunnel area in 1900. No new discoveries of importance were made until the Newhall-Potrero field was found in 1937. The major discoveries in the area from 1938 to 1953 were the Del Valle field in 1940, the Romano field in 1945, the Placerita field in 1948, and the Castaic Junction field in 1950 (Winterer and Durham, 1962).

Since the 1930s, most of the oil discoveries and production in the Newhall area have steadily declined, though some production continues locally (CDOG, 1991). Oil production was reactivated in the 1940s and continues today in Placerita Oil Field using steam injection (Janes, 1991).

6.1.3 Onsite Occurrence of Oil

At the project property, oil and oil-related deposits (i.e., tar) occur both at the surface and in the subsurface. These are discussed in the following sections.

6.1.3.1 Oil Seeps and Tar Deposits

Numerous tar seeps and petroliferous rocks have been mapped at the project property (Janes, 1991) that primarily are associated with Towsley and Pico Formations. To a lesser extent, tar and a few oil/tar seeps occur within fractures developed in the San Gabriel Formation and Eocene rocks. Oil present in Towsley and Pico Formations occurs within intergranular pore space and also within fractures. In general, active oil/tar seepage emanates from relatively small openings along fractures in all of these rocks, and from bedding planes in sedimentary rocks. Oil seeps and tar accumulations are also common along the Towsley-Eocene unconformity.

Tar seeps mapped on the project property commonly are found in canyons cut into the Towsley Formation, and to a lesser extent, Pico and San Gabriel Formations and Eocene rocks. The greatest number of these were mapped in Elsmere Canyon North, where approximately twelve tar seeps have been mapped on the north side of the canyon near the contact of the lower and upper members of the Towsley Formation. In the lower reaches of Elsmere Canyon North, several tar seeps were mapped in Eocene rocks in the general vicinity of the trace of the Whitney Canyon fault. Several actively flowing oil/tar seeps in this area also produce small quantities of water, as evidenced by the oil seep located near the onsite trench excavated within Elsmere Canyon (Plate 1, T-3). Extensive areas of tar accumulation from continued past seepage are associated with active seeps located along the northern side of the canyon. Several tar seeps have been mapped in tributaries to Elsmere Canyon North, in both the lower Towsley and San Gabriel Formations. In this same area, tar-impregnated lower Towsley beds are exposed for a distance of about 1,200 feet up a tributary on the south side of Elsmere Canyon North near the confluence with Elsmere Canyon.

Further downstream within Elsmere Canyon, tar seeps are also present, but are generally fewer in number, at the confluence of Elsmere Canyon North and South (lower Towsley and Eocene rocks), and in the drainage bottom located in the northwest portion of the property (Towsley Formation). Other areas where tar seeps occur at the project property include: 1) a tributary to Elsmere Canyon located on the north side of Cliff Face Ridge (Pico Formation); 2) a large landslide mass in the Pico-Towsley rocks on the lower southwest slope below Cliff Face Ridge; and 3) the north and northwest side of Power Tower Hill (lower Towsley). At the latter location, an extensive tar accumulation has been mapped along much of the northwest crest of Power Tower Hill (Janes, 1991).

Oil-impregnated or petroliferous rocks occur in extensive outcrops in three main areas of the project property, including: 1) the northwest portion of the property below Pico Ridge and within lower Elsmere Canyon drainage; 2) upper reaches of Elsmere Canyon North; and 3) the south and southwest portions of the property, including where extensive landsliding has occurred (Janes, 1991). These oil-bearing deposits are most commonly associated with the lower Towsley Formation, Pico Formation, and to a lesser extent, upper Towsley rocks.

6.1.3.2 Subsurface Accumulations

Two oil producing areas of the Newhall Oil Field are located at the project property (Plate 8). The Elsmere area is located in the northwestern portion of the project property, and the Tunnel area is located in the southwestern portion. The average depth of shallowest producing oil reservoirs within the Upper Towsley-Pico Formation in the Tunnel and Elsmere areas are 600 and 780 feet, respectively (Slade, 1988). No oil wells have been drilled within the limits of the proposed landfill footprint.

Several small north-south trending faults, identified by surface mapping and subsurface correlation, provide structural traps for petroleum accumulation (Winterer and Durham, 1962). Faults in the area that appear to control oil and gas accumulation include the Legion fault, Beacon fault, Whitney Canyon fault, and Elsmere Field faults A and B. The east-west trending Legion fault marks the northern boundary of the Elsmere area and separates two areas of slightly divergent strike and dip. South of the fault, accumulations of oil in the Elsmere and Tunnel areas occur in southwest dipping beds. North of the fault, strata dip to the northwest where the producing Whitney Canyon and Townsite areas are located.

Elsmere Area: The Elsmere area includes approximately 100 acres in Elsmere Canyon and the adjacent Elsmere Ridge (Plate 8). Oil accumulation is within a faulted anticlinal trap, with production from the Towsley and Pico Formations, and possibly from Eocene rocks, at depths of less then 1,500 feet (Oakeshott, 1958; Winterer and Durham, 1962). Oil production in the Pico Formation has been from sandstone and conglomerate beds within the middle portion of the unit (middle member of Oakeshott, 1958). Production from Towsley likely has been from lenticular beds of similar lithology contained in siltstone and fine-grained deposits.

Tunnel Area: The Tunnel area was named after its proximity to the north portal of the former highway tunnel in San Fernando Pass and includes about 140 acres, a portion of which lies within the project boundary (Plate 8). Like the Elsmere area, production was from stratigraphic and fault traps in the Pico and Towsley Formations. The majority of production was from sandstone and conglomerate beds of the Towsley Formation (Winterer and Durham, 1962), and possibly also from the Miocene-age Modelo Formation (CDOG, 1991). Production of large amounts of salt water was also common in this field.

6.1.4 Historic Onsite Oil Exploitation

Elsmere Area: Of the 33 wells drilled in the Elsmere area, the deepest reached a total depth of 2,821 feet below ground surface (bgs) (CDOG, 1991). Oil produced in the area averaged about 14° gravity, with large amounts of associated salt water limiting production. Cumulative oil production from the Elsmere area totalled slightly over one million barrels (bbls) (CDOG, 1991).

The first recorded exploration in the Elsmere area was in 1889 by Pacific Coast Oil Company, which drilled a total of 20 wells ranging in depth from 420 to 1,376 feet bgs. The highest initial production was in Elsmere #2 well, completed in 1891 to total depth of 1,226 feet bgs, but according to Oakeshott (1958), the well probably produced from a depth of less than 485 feet bgs. This well produced 229 barrels of oil in the first four days but declined to 6 bbls/day (barrels per day) by 1894. Standard Oil of California (now Chevron) purchased Pacific Coast Oil Company's holdings in 1902, and drilled two additional wells in 1916 and 1917 to depths of 1,611 and 691 feet bgs, respectively, but the wells had little to no production.

Between 1900 and 1921, several other small oil companies drilled approximately 11 wells and established additional production in the Elsmere area. These included Alpine Oil Company, Santa Ana Oil Company, E.A. and D.L. Clampitt, and Republic Petroleum Corporation. These wells, typically completed at depths ranging from 600 feet to 1,400 feet bgs, produced small quantities of low gravity oil with variable amounts of water.

There has been no production from the Elsmere area since 1955, and the area was abandoned in 1987 (CDOG, 1991). Chevron Production Company has recently been observed plugging and abandoning several wells in the Elsmere area (Janes, 1991, personal communication).

Tunnel Area: Approximately 31 oil exploration wells were drilled in the Tunnel area, although not all were located on the project property. The deepest well reached a total depth of 4,037 feet bgs. Oil production in 1990 was 6,943 bbls, and cumulative production through 1990 totalled approximately 2.3 million bbls (CDOG, 1991).

The first oil exploration in the Tunnel area was conducted by E.A. Clampitt in 1900, who drilled five wells along Newhall Creek between 1900 and 1902. These wells ranged between 645 and 760 feet in depth. The first well, Zenith Oil #1, encountered ten feet of oil sand between 640 and 650 feet bgs and produced approximately 7 barrels of 14° gravity oil per day.

Sixteen wells were drilled between 1900 and 1909 by numerous small companies to depths ranging between 645 and 2,100 feet, with all but three less than 1,000 feet bgs. These wells experienced little or no oil production. Between 1922 and 1932, nine wells were drilled or acquired by Southern California Drilling Company. The best initial production was 200 bbls/day of 19° gravity oil with 10 percent water from the Needham Well #1. York-Smullin Oil Company drilled six wells ranging in depth from 1,184 to 1,952 feet between 1929 and 1931, with initial production ranging from 76 to 220 bbls/day of 19° to 27° gravity oil (Winterer and Durham, 1962).

By 1943, approximately 31 wells had been drilled in the Tunnel area. In the early 1950s, several small operators developed relatively shallow wells in the area. Like previous production in the area, these wells had modest records of low-gravity oil production. At present, there is no oil production on the project property, including Tunnel and Elsmere areas (Janes, 1991). Operating practices in both oil producing areas are not well documented. However, CDOG reports indicate that waste water from oil production was reinjected. Visual inspection of the old producing areas found numerous oil stained areas which suggests that spills were probably commonplace (Janes, written correspondence, 1992).

6.2 OTHER MINERAL RESOURCES

6.2.1 Regional Resources

Over 25 mineral commodities have been found in the western San Gabriel Mountains and surrounding areas, and eleven of these have been produced in significant amounts (Oakeshott, 1958). Other than petroleum, the most important area resource commodities of actual or potential commercial value include: rock products such as sand and gravel, granite, limestone, anorthosite (abrasive for cleanser, poultry grits, pozzolanic cement), shale (carrier for insecticide), tuff (chinchilla dust; burnt for roofing granules), muscovite mica, quartz (silica), and potash feldspar. Non-metallic mineral deposits include borates, gypsum, and graphite. Metals and metallic ores historically produced in the region include placer deposits of ilmenite-magnetite and gold, titaniferous magnetite, molybdenite, quartz veins bearing gold and sulfides of antimony, cobalt, copper, lead, silver, and zinc, and uranium/thorium-bearing pegmatite (Oakeshott, 1958).

6.2.2 Potential Onsite Resources

The only mineral resource historically developed within the boundaries of the project property is petroleum (Oakeshott, 1958). There is currently no oil production on the project property (Janes, personal communication, 1991).

Potential onsite mineral resources may include rock products such as sand, gravel, and crystalline granitic rocks. Additionally, minerals associated with quartz veins, such as gold and sulfide deposits may also exist in the eastern portion of the project property in the basement rocks of the San Gabriel Formation. However, commercially valuable quantities of these minerals are not known to be present at the project property at this time.

7.0 REGIONAL SEISMICITY

Regional seismicity of the project area is controlled by faults and fault systems within several of the geologic provinces discussed in Section 4.1. Although numerous faults exist within each of these provinces, typically only a limited number of major faults and fault zones actively accommodate strain release within a particular province. Large historical earthquakes in southern California have all been associated with recognized surface faults or blind thrust faults underlying active folds (e.g., Allen, 1975; Yerkes, 1985; Davis and others, 1989). The historic seismicity of the region within approximately 60 miles (100 kilometers (km)) of the project property is summarized in Section 7.1 below, followed by definition and description of regional potential seismogenic sources in Section 7.2 and its subsections.

7.1 HISTORIC SEISMICITY

The project property is located within a moderately active seismic area relative to many other parts of southern California, as shown on Figure 15. The figure presents historic earthquake epicenter data on file at the National Oceanographic and Atmospheric Administration (NOAA) within 100 kilometers of the project property (this includes a 100-km or 62.5 mile radius). Magnitude 4 and greater earthquakes are plotted, covering a period from 1812 to 1992. Shown on Figure 15 are numerous historic earthquake epicenters to the east, northeast and southeast of the project property. These were primarily aftershocks associated with the 1971 San Fernando earthquake on the San Fernando fault zone which had a moment magnitude (M_W) of 6.6 and local magnitude (M_L) of 6.4. The epicenter of the San Fernando earthquake was located approximately 6½ miles northeast of the project property (Figure 5), with a focus on the order of 8 kilometers deep (Whitcomb, et al., 1973). Other historic earthquakes which may have caused significant strong ground motion in the region include the 1857 Fort Tejon earthquake (M_W 7.9) on the San Andreas fault, and the 1952 Arvin-Tehachapi earthquake (M_W 7.5) in the southern San Joaquin Valley. The 1952 Arvin-Tehachapi earthquake occurred along the White Wolf fault, or possibly the Pleito thrust fault, and is approximately located at latitude 35° north, longitude 119° west, on the order of 40 to 45 miles from the project property (Figure 15). Numerous aftershocks were also associated with this earthquake, as seen in the figure.

Most other historical seismic activity shown on Figure 15 is associated with faults and fault zones located in the southern portion of the Great Valley, Los Angeles Basin, Transverse Ranges, and central Mojave Desert. In the southern Great Valley, a cluster of earthquakes shown to the northeast of the White Wolf-Pleito fault zone is located in the vicinity of mapped races of the Kern Front fault, Kern Gorge fault, and Oilfields fault zone; some of these may have been related to subsidence induced by oil withdrawal. Another grouping of earthquake epicenters is in the vicinity of the intersection of the San Andreas fault, San Jacinto fault and Sierra Madre fault zone. To the west and southwest, other clusters of earthquake epicenters are located in the Los Angeles Basin area in the general vicinity of faults such as the Whittier fault, Elsinore fault, Elysian Park fault, Santa Monica fault zone, and the Newport-Inglewood fault zone.

7.2 POTENTIAL REGIONAL SEISMOGENIC SOURCES

Faults which historically have been the source of earthquakes or that show evidence of displacement during Holocene time (the last 11,000 years) are considered to be active faults by the State of California, Division of Mines and Geology. If movement during historic or Holocene time cannot be demonstrated, but movement may have occurred during Quaternary time (i.e., the last 1,800,000 years) the fault is classified as potentially active (CDMG, 1973; 1980 revision). Active and potentially active faults located in the region considered to have the greatest potential to generate significant strong ground shaking at the project property are listed in Table 7 and shown on Figure 5. Other active and potentially active faults located within approximately 60 miles (~100 km) of the project property are also shown on Figure 5. However, because of the greater distance of these faults from the property and/or lower estimated magnitudes for potential earthquakes generated on these other structures, they pose a lower potential seismic risk than the faults listed in Table 7. Descriptions of the potentially significant major faults are presented in the following sections.

7.2.1 San Andreas Fault

The San Andreas fault is the dominant tectonic and seismic feature in California. Three of California's five largest historic earthquakes, the 1906 San Francisco earthquake, the 1857 Fort Tejon earthquake, and the 1989 Loma Prieta earthquake, occurred on the San Andreas fault. The 1857 and 1906 events were characterized by right-lateral surface displacements of 16 to 36 feet (5 to 11 meters) and rupture lengths in excess of 200 miles (300 km) (Sieh, 1978), while the rupture mechanism for the 1989 event involved reverse faulting, and primary surface rupture did not occur. The closest segment of the San Andreas fault to the project property is the Mojave segment, located approximately 21 miles (34 km) northeast of the project property (Figure 5). This segment last ruptured in 1857 during the Fort Tejon (M_W 7.9) earthquake. Subsequent to 1857, this segment of the fault has been characterized by low levels of seismicity. It is inferred that this segment of the fault is currently locked and substantial strain is accumulating. Geologic data indicate a slip rate of approximately 25 to 30 mm/yr on the Mojave segment. Paleoseismic data indicate this strain is characteristically released during infrequent, major to great earthquakes of M_W 7½ to 8+ with an average recurrence of 162 years (National Earthquake Prediction Evaluation Council (NEPEC, 1992)). As many as five of these events may have ruptured the Mojave segment since AD 1100 ± 65 (Sieh, 1984; Sieh and others, 1989). The USGS (1988) has indicated a conditional probability of 30 percent for the occurrence of a Magnitude 7½ event along this segment in the next 30 years (1988 to 2018). This estimated conditional probability was recently re-affirmed by the NEPEC (1992).

7.2.2 Garlock Fault

The Garlock fault is an east-west trending, left-lateral strike-slip fault that bounds the northern edge of the Mojave Desert. The fault extends approximately 150 miles (240 km) from its junction with the San Andreas fault near Tejon Pass eastward to south of Death Valley. The project property is located approximately 40 miles (64 km) south of the western portion of the fault. The Garlock fault has been active throughout the Cenozoic and exhibits abundant surficial evidence of late Pleistocene and Holocene-age displacement (Clark, 1973; Clark and Lajoie, 1974; Carter, 1980; LaViolette and others, 1980; and McGill and Sieh, 1991) and folding (Smith, 1991). Roquemore and others (1982) indicated as many as six surface rupture events may have occurred on this fault during the Holocene. While historical seismic activity has been relatively low on the Garlock fault compared to other major faults, an average of three local magnitude (M_L) > 2.5 earthquakes per year occurred on the fault during the period of 1932 to 1981. The largest of these events was M_L 4.3 (Astiz and Allen, 1983). A preferred slip rate of 7 to 11 mm/yr on the central portion of the fault has been reported (Clark and others, 1984), although more recent data suggest the slip rate may be 4 to 8 mm/yr (McGill and Sieh, 1991). A conservative slip rate of 9 mm/yr was used for assessing the seismic potential of the Garlock fault. Based on the slip per surface rupture event indicated by offset geomorphic features and estimated slip rates, McGill and Sieh (1991) estimated recurrence intervals of between 200 and 3,000 years for large earthquakes which generate surface faulting on the various segments of the Garlock fault.

7.2.3 San Gabriel Fault

The San Gabriel fault is a northwest trending, right-lateral strike-slip fault which dips steeply (70-80°) to the north. South of the Honor Rancho Oil Field, the fault exhibits a significant reverse component of slip (Stitt, 1986). The portion of the fault exhibiting late Pleistocene and Holocene displacement extends at least 50 miles (80 km) from near the San Andreas fault on the north to the Sierra Madre fault on the south (Weber, 1982, 1986; Ziony and Jones, 1989; Jennings, 1992). The surface trace of the San Gabriel fault is located approximately two miles (3.2 km) northeast of the project property at its closest point. Holocene displacement has been documented only along a 5-mile (8-km) long segment of the fault in the Saugus area (Jennings, 1992). The most recent displacement documented at this location occurred between 3,500 ± 250 years before present (ybp) and 1,500 ± 190 ybp (Cotton, 1986). Some microseismicity may be associated with the San Gabriel fault, but the data are inconclusive. There are no reliable slip rate data for this fault (Cotton, 1986), by which to judge its degree of activity. Given the geomorphic expression of this fault relative to other strike-slip faults in southern California, a 1 mm/yr slip rate was assumed in assessing the seismic potential of the San Gabriel fault.

7.2.4 San Fernando-Sierra Madre Fault Zone

The San Fernando-Sierra Madre fault zone is an arcuate, east-west trending series of north-dipping thrust and reverse faults that extends approximately 35 miles (55 km) from north of Upland on the east, to the northern San Fernando Valley on the west (Smith, 1978; Crook and others, 1978, 1987). The fault zone consists of numerous segments which have been active during the late Quaternary. However, evidence for a large scale rupturing of the entire fault zone during a single event has not been found (Crook and others, 1987). The surface trace of the closest segment of the fault zone to the project property, the San Fernando segment, is located approximately 4 miles (6 km) to the south (Figure 5). This segment was the source of the 1971 San Fernando earthquake (M_W 6.6), and thus may be less likely to generate a significant earthquake in the future relative to other segments of the fault zone. The segment located southeast of the San Fernando segment is the most active segment of the San Fernando-Sierra Madre fault zone based on the available geologic evidence (Crook and others, 1987). The recurrence interval for earthquakes which cause surface fault rupture along this segment is estimated to be between 1,000 and 10,000 years (Crook and others, 1987). The estimated slip rate for the Sierra Madre fault is 0.4 to 4.0 mm/yr (Clark and others, 1984). A slip rate of 3 mm/yr was used for assessing the seismic potential of this fault zone.

7.2.5 Santa Susana Fault Zone

The Santa Susana fault zone extends approximately 17½ miles (28 km) from near the western end of the San Fernando fault zone to the Oak Ridge fault (Yeats, 1987). This north-dipping reverse fault zone is located near the base of the Santa Susana Mountains approximately 4 miles (6½ km) south-southwest of the project property (Figure 5). Although some secondary surface displacement occurred on the fault associated with the 1971 San Fernando earthquake, there is no geologic evidence of displacement of Holocene-age alluvium (Lung and Weick, 1987; Yeats, 1987b), but late Pleistocene displacement is probable (Smith, 1978). The fault zone has a relatively low level of seismicity but is the probable source of a M_W 4.6 earthquake in 1976, and may have been the source of a moderate to large earthquake in 1893 (Pechmann, 1987; Yeats, 1987). The estimated slip rate for the fault zone is 1.2 to 4.5 mm/yr (Wesnousky, 1986). A slip rate of 2 mm/yr was used for assessing seismic potential of the Santa Susana fault zone.

7.2.6 Verdugo-Eagle Rock Fault

The Verdugo-Eagle Rock fault is located near the southwestern base of the Verdugo Mountains and San Rafael Hills (Weber, 1980). The fault is delineated by southwest-facing scarps in Holocene-age alluvial deposits, subsurface faults exposed in gravel pits, and apparent gravity and groundwater anomalies (Weber, 1980), and extends for at least 12½ miles (20 km). Historic seismicity is not known to be associated with the fault, and the late Quaternary slip rate is unknown. The fault is located approximately 7 miles (11 km) southeast of the project property. A slip rate of 1 mm/yr was assumed for assessing seismic potential of the Verdugo-Eagle Rock fault.

7.2.7 Northridge Hills Fault

The Northridge Hills fault is inferred to extend southeast approximately 9½ miles (15 km) from its intersection with the Simi fault in the northwest corner of the San Fernando Valley. Structural relationships at this intersection strongly indicate that these two faults are separate structures (Weber, 1980). This north-dipping reverse fault displaces late Pleistocene, and possibly Holocene-age alluvium. The fault is delineated by physiographic features and subsurface groundwater barriers. Some aftershocks of the 1971 San Fernando earthquake are located close to the fault (Weber, 1980; Ziony and Yerkes, 1985). No slip rate is available for the fault, but Wesnousky (1986) estimated the slip rate to be less than 0.1 mm/yr. Consequently, a 0.1 mm/yr was used in assessing the seismic potential of this fault. The Northridge Hills fault is located approximately 7½ miles (12 km) west-southwest of the project property (Figure 5).

7.2.8 Santa Monica Fault Zone

The Santa Monica fault zone comprises an approximately east-west trending system of north-dipping, reverse faults which form the northern boundary of the Peninsular Ranges structural province in the Los Angeles Basin area. West of the intersection with the coastline at Santa Monica, the Santa Monica fault zone includes the Malibu Coast fault and a southern offshore branch, the Anacapa (Dume) fault. East of the coastline, the fault zone includes the Potrero Canyon, Santa Monica, and Hollywood faults. Available data suggest that faults of the Santa Monica fault zone have displaced deposits of late Pleistocene age, and there is limited evidence of displacement of deposits of Holocene age (Crook and others, 1983; Hill and others, 1979; H. Spellman, Converse Consultants, personal communication, 1987; McGill, 1981,1982). The fault zone is seismically active and was the source of the 1973 Pt. Mugu (M_W 5.9) earthquake (Real, 1987; Hauksson and Saldivar, 1989). It has an estimated vertical slip rate of 0.3 to 0.4 mm/yr (Clark and others, 1984). A slip rate of 0.4 mm/yr was used for assessing seismic potential. The Santa Monica fault zone is located approximately 19 miles (31 km) south of the project property (Figure 5).

7.2.9 Newport-Inglewood Fault Zone

The Newport-Inglewood fault zone (Figure 5) consists of a series of subparallel, en echelon faults and folds that trend to the northwest from Newport Bay to Beverly Hills, where it either merges with, or is truncated by the Santa Monica fault zone (Barrows, 1974; Lang and Dreesen, 1975). The total length of the fault zone is greater than 50 miles (80 km). Recent seismic activity is indicated by numerous historic earthquakes including the 1933 Long Beach earthquake (M_L 6.3) and the 1920 Inglewood earthquake (M_L 4.9) (Hauksson, 1987). Surface displacement may have occurred on a segment of the fault zone located in the Newport Beach area during the 1933 earthquake (Guptil and Heath, 1981). The estimated vertical slip rate for the northern segment of the fault zone is 0.1 to 1.2 mm/yr (Clark and others, 1984), and a slip rate of 1 mm/yr has been used for assessing seismic potential. The northern segnent of the Newport-Inglewood fault zone in the Baldwin Hills is located approximately 24 miles (39 km) south of the project property.

7.2.10 Oak Ridge Fault

The Oak Ridge fault (Figure 5) is a south-dipping reverse fault that extends from east of Fillmore along the northern flank of Oak Ridge and South Mountain to the coastline south of Ventura, a distance of approximately 31 miles (50 km), and an additional approximately 21 miles (34 km) offshore (Burdick and Richmond, 1982). The fault can be divided into an eastern and western segment near Saticoy. The closest mapped portion of the eastern segment of the fault is approximately 14 miles (22.5 km) west of the project property.

Evidence of Holocene-age displacement on the eastern segment of the fault was observed in a trench excavated across a secondary normal fault scarp in the upper plate of the fault zone (Yeats and Gardner, 1986). This displacement was interpreted to be associated with large earthquakes on the Oak Ridge fault. Yeats (1988) estimated the post-Saugus reverse slip rate on the eastern segment to be on the order of 5.9 to 12.5 mm/yr, whereas post-Saugus reverse slip on the western segment is considerably less (Yeats, 1988). Offshore data (Greene, et.al., 1978) suggest the late Pleistocene slip rate is less than the long term rate. Wesnousky (1986) has suggested a preferred slip rate of 3.5 mm/yr, which has been used for assessing seismic potential of the Oak Ridge fault.

7.2.11 San Cayetano Fault

The San Cayetano fault (Figure 5) is a reverse fault located along the southern base of the Topatopa Mountains, extending from the eastern Ojai Valley to east of Piru, a distance of approximately 26 miles (42 km) (Weber, et.al., 1975; Yeats et.al., 1982; Keller et.al., 1982; Rockwell, et.al., 1983). At depth, the fault dips north typically less than 60° and commonly decreases in dip at the surface (Yeats 1981; 1983; Rockwell, et.al., 1983). Late Pleistocene and Holocene-age alluvium and geomorphic surfaces are offset along the fault (Keller, et.al., 1982; Rockwell, et.al., 1983; Kahle, 1985). Estimated slip rates based on C^{14} dating and soil chronology range from 1 mm/yr to 8.7 mm/yr (Rockwell, et.al., 1983; Clark, et.al., 1984), and an apparent minimum of 24,750 feet (7.5 km) reverse separation of a 1.0 m.y. datum would yield a long-term slip rate of 7.5 mm/yr. Slip rates based on offset of late Pleistocene and Holocene-age deposits are 3 mm/yr or less, suggesting a variable slip on the fault through time. A slip rate of 3 mm/yr has been used to assess the seismic potential of the San Cayetano fault. The closest approach of the San Cayetano fault is approximately 17 miles (27 km) west of the project property.

8.0 REGIONAL HYDROGEOLOGIC SETTING

The regional hydrogeologic setting of the project property can be characterized in terms of major groundwater basins defined by the California Regional Water Quality Control Board (RWQCB) in California. The project property and surrounding area falls within two of these major basins: 1) the Santa Clara River Basin; and 2) the Los Angeles River Basin (RWQCB, 1975a and 1975b). The boundary between the two basins generally coincides within the east-west trending topographic divide formed by the San Gabriel Mountains and the Santa Susana Mountains (Figure 12). In the general area of the project, groundwater flow to the north and west occurs within the Santa Clara River Basin, and groundwater flow to the south enters the Los Angeles River Basin. Locally at the project property, the boundary between the two major basins is located along the steep ridgeline traversed by East Firebreak Road (Figure 12 and Plate 7A), and continues to the west at the crest of San Fernando Pass into the Santa Susana Mountains. Most of the project property lies northwest of this divide and therefore falls within the Santa Clara River Basin drainage area, with the smaller portion of the property southeast of the divide included within the Los Angeles River Basin. The proposed landfill footprint lies entirely with the Santa Clara River Basin surface drainage area (Figure 12). These two hydrologic basins and their subunits and divisions applicable to the regional hydrogeologic setting of the project property are discussed below.

8.1 HYDROLOGIC BASIN DIVISIONS

The Santa Clara River Basin and the Los Angeles River Basin have been divided into various units, subunits, subareas and basins that define groundwater conditions on a more local scale. Applicable nomenclature for the Santa Clara River Basin used herein follows that of the RWQCB (1975a). Subdivisions of the Los Angeles River Basin follow terminology of the RWQCB (1975b) and that of Brown (1975) and Blevins (1989). The table below summarizes the subdivisions immediately north and south of the drainage divide between the two major basins. A discussion of the two basins and applicable subunits will follow.

APPLICABLE GROUNDWATER BASIN HIERARCHY
NORTHWEST OF DRAINAGE DIVIDE [1]
SANTA CLARA RIVER BASIN
Santa Clara-Calleguas Hydrographic Unit
Upper Santa Clara Hydrographic Subunit
Eastern Hydrographic Subarea
SOUTHEAST OF DRAINAGE DIVIDE [2]
LOS ANGELES RIVER BASIN
Upper Los Angeles River Area
Sylmar Basin or Subarea (includes San Fernando Pass area of San Fernando Basin)

Note: Drainage divide in the vicinity of the project property is approximately defined by East Firebreak Road shown in Figure 12.

Sources: 1 - CRWQCB, 1975a; b
2 - CRWQCB, 1975b; Brown, 1975; Blevins, 1989

Santa Clara River Basin: The Santa Clara River Basin lies northwest of Los Angeles, near the center of the Transverse Ranges of southern California (Bowers and Irwin, 1978). It is bounded by the Santa Susana and San Gabriel Mountains on the south and the Sawtooth Mountains on the north. The Upper Santa Clara River Hydrographic Subunit is one of four primary subunits of the Santa Clara River Basin, comprising that portion of the Santa Clara River watershed and its tributaries above the Los Angeles-Ventura County line (RWQCB, 1975a). The Upper Santa Clara River Hydrographic Subunit is further subdivided into five hydrographic subareas (RWQCB, 1975a). The proposed landfill footprint and the majority of the project property lies within the Eastern Hydrographic Subarea of the Upper Santa Clara River Hydrographic Subunit, largest of the five subareas with an areal extent of 480 square miles (Figure 12). The Eastern Hydrographic Subarea contains the entire drainage areas of Castaic Creek, Lake Elizabeth Canyon, Placerita Creek, and their confluence with Santa Clara River. The subarea also receives flow from the river itself and several smaller tributaries originating in the other four subareas.

Los Angeles River Basin: The Los Angeles River Basin encompasses the coastal areas of Los Angeles County south of the San Gabriel and Santa Susana Mountains, plus a small coastal portion of Ventura County south of the divide of the Santa Monica Mountains. The Upper Los Angeles River Area encompasses a majority of this basin, including the watershed of the Los Angeles River and its tributaries above the junction of the Los Angeles River and Arroyo Seco (Blevins, 1989). Total area is approximately 515 square miles, including slightly more than 190 square miles of valley fill area, (referred to as groundwater basins), and 325 square miles of hills and surrounding mountains. The southernmost portion of the project property is located in the northern, mountainous part of the area, and drains toward the Sylmar Basin (Figure 12). The Sylmar Basin is a distinct, fault-bounded hydrologic subarea of the San Fernando Basin formed by thrusting within the sedimentary section along the San Gabriel Mountain front. Based on topography, it appears that surface drainage immediately south of San Fernando Pass area would flow toward Van Norman reservoirs area where the boundary between the Sylmar and San Fernando Basins is drawn just to the east of the reservoirs (Blevins, 1989). A complicated groundwater flow regime has been interpreted in this general area (Brown, 1975; Blevins, 1989). Therefore, for purposes of discussing the regional hydrogeology, this area has been included within the Sylmar Basin Subarea.

As mentioned above, most of the project property and all of the proposed landfill footprint is located northwest of the drainage divide and within the Eastern Hydrographic Subarea of the Santa Clara River Basin (Figure 12). Therefore, further discussion of the regional hydrogeologic setting will be primarily focused on characteristics of the Eastern Hydrographic Subarea. The discussion will also be supplemented with pertinent available information for the Sylmar Basin Subarea of the Los Angeles River Basin.

8.2 REGIONAL HYDROGEOLOGIC UNITS

The following sections discuss hydrogeologic units in terms of: 1) their known or potential productivity as fresh-water bearing deposits; or 2) their likelihood to behave as aquitards or practically be non-water bearing units due to poor aquifer characteristics, such as low hydraulic conductivities, lack of primary porosity, very limited storage capacities and low yield potentials. Included within the latter group are hydrogeologic units which are considered as non-productive because of poor inherent water quality, presence of oil-bearing strata and related oil brine waters.

8.2.1 Productive Aquifers

Eastern Hydrographic Subarea: The productive or potentially productive fresh water-bearing units within the Eastern Hydrographic Subarea of the Santa Clara River Valley are depicted in Figure 12 and consist of: 1) undifferentiated alluvial or valley fill deposits (Qal) which underlie the Santa Clara River and its tributaries; and 2) partially consolidated sediments of the Saugus Formation (QTs) which underlie river/tributary alluvium and are exposed in hills surrounding the river valley (Slade, 1988). Based on analysis of oil well resistivity geophysical logs, the Saugus Formation may contain fresh water to depths as great as 5,000 feet (Slade, 1988). However, the cumulative thickness of potentially useable aquifer sands within the combined alluvium-Saugus section varies from 400 feet to 1,400 feet (Slade, 1988).

Alluvium occurring within Eastern Hydrographic Subarea in the valley floor includes floodplain, stream channel, and alluvial fan deposits. These sediments, collectively shown in Figure 12, are composed of extensively interlayered and interfingered mixtures of gravel, sand, silt, and clay, with variable amounts of cobbles and boulders (Slade, 1988). The maximum thickness of alluvium varies along the Santa Clara River, but generally is considered to be on the order of 200 feet (Slade, 1988). Quaternary terrace deposits capping mesa areas along the Santa Clara River valley are of similar composition as alluvium, but not considered to be part of the regional aquifer system since they occur above the regional water table (Slade, 1988).

The Saugus Formation (Figure 12), predominantly consisting of conglomerate, sandstone, and alluvial deposits, is generally under confined (artesian) conditions within the Eastern Hydrographic Subunit (Slade, 1988). The maximum thickness of water-bearing Saugus deposits containing fresh water varies from 1,500 feet to 5,500 feet within this region, depending on the relative location with respect to faults (specifically, the San Gabriel and Holser faults).

In a hydrogeologic assessment of the Saugus Formation, Slade (1988) suggested that based on well log analysis, the Pico Formation underlying Saugus deposits may be fresh-water bearing south of the Holser and San Gabriel faults. However, the study did not specifically evaluate the hydrogeology or potential aquifer characteristics of the Pico Formation. In other areas of the Eastern Hydrographic area, the Pico Formation contains brackish water and would not be considered a productive or potentially productive aquifer (Slade, 1988).

Sylmar Basin Subarea: Water-bearing deposits within the Sylmar Basin Subarea consist of Holocene alluvium, older alluvium (Pleistocene-age alluvium and terrace deposits), and the Saugus Formation (Oakeshott, 1958; Brown, 1975). Holocene alluvium has been derived from erosion of materials in the San Gabriel and Santa Susana Mountains and is comprised of unconsolidated fine to very coarse-grained deposits of clay, silt, sand and conglomerate. These materials vary according to source and proximity of the parent terrane (e.g., crystalline basement versus fine-grained sedimentary units), and are on the order of 50 to 60 feet thick. Older alluvium, which is up to 300 to 500 feet thick in the Sylmar Basin Subarea, is lithologically similar to Holocene alluvium, typically only locally consolidated (Brown, 1975). The Saugus Formation is a poorly sorted, loosely consolidated conglomerate and coarse sandstone, with layers and lenses of clay and clayey gravel. The Saugus Formation is as much as 6,400 feet thick in the Sylmar Basin Subarea (Brown, 1975).

8.2.2 Aquitards and Non-productive Units

Eastern Hydrographic Subarea: Within the Eastern Hydrographic Subarea, regional geologic formations that can be considered as aquitards include older Tertiary-age sedimentary deposits underlying the Saugus Formation, such as the Pico and Towsley Formations, Eocene rocks, and crystalline basement rocks (Figures 12 and 13). This assessment is based on known or likely characteristics such as lack of primary porosity, very limited storage capacities and yield potentials, and low hydraulic conductivities. Also included in this discussion are hydrogeologic units which are considered as non-productive because of poor inherent water quality, presence of oil-bearing strata and related oil brine waters.

The Pico Formation underlies Saugus deposits and predominantly consists of sandstone, siltstone, and conglomerates where exposed at Elsmere, Whitney and Placerita Canyons. The unit grades into fine-grained sandstone, siltstone, and mudstone to the west in outcrop and in the subsurface (see Section 4.2.3). The Pico Formation is mainly a marine deposit (Winterer and Durham, 1962) and generally contains brackish water within the Eastern Hydrographic Subarea, although Slade (1988) indicated that it may be fresh-water bearing in some eastern areas (Figure 13 and preceding section). Conglomerate in the lower portion of this formation has been reported to contain tar (Winterer and Durham, 1962), and strata within the Pico locally produce oil at Placerita Oil Field and the Elsmere area of Newhall Oil Field (CDOG, 1991). The Pico Formation has only been exploited for stock watering by the installation of a few wells (Slade, 1988), and regionally, the formation can be considered to be a non-productive aquifer.

The Towsley Formation, as discussed in Section 5.2.2, consists of siltstone, silty sandstone, and very fine-grained sandstone at Elsmere Canyon and thickens considerably to the west where it primarily consists of mudstone, siltstone and shale with lenticular sandstone and conglomerate beds (Winterer and Durham, 1962). The Towsley Formation was deposited within depositional environments ranging from nearshore to deep marine. Based on subsurface well and open-hole testing performed at the project property (Janes, 1991 and data presented in Appendix D), the Towsley typically has very low hydraulic conductivities (see later Section 9.1.2). Natural oil seeps occur in the formation at Elsmere Canyon, and lower Towsley sands have produced oil at the Tunnel area and Whitney Canyon area of

Newhall Oil Field (CDOG, 1991). Regionally, fine-grained deposits of Towsley, including siltstone, mudstone and shale, are considered to be aquitards to groundwater flow.

Sedimentary units older than the Towsley Formation occurring in the subsurface in the Eastern Hydrographic Subarea include the Modelo Formation, Topanga Formation, and Paleocene-Eocene rocks (see Figure 6A, Newhall area). The Modelo and Topanga Formations are exposed in the Santa Susana Mountains where they are typically comprised of interbedded siltstone, mudstone, and fine-grained sandstone. Eocene rocks occur in the subsurface in the Eastern Hydrographic Subarea but regionally are only exposed in outcrop within Elsmere Canyon (Figure 12), where they are comprised of well indurated sandstone, siltstone, and lenticular conglomerate beds (Janes, 1991). Slade (1986; 1988) collectively considered the older consolidated and cemented Tertiary rocks of the Eastern Hydrographic Subarea not to be part of the groundwater reservoir in the area, due to their low primary porosity, limited storage capacity, and low potential yield. Likewise, their affiliation to much of the oil field production at Newhall and surrounding areas (i.e, production from Modelo beds) indicates these rocks do not contain useable groundwater.

Igneous and metamorphic crystalline basement rocks are exposed in the upper watershed areas of the Sierra Pelona and the San Gabriel Mountains. These crystalline rocks generally yield only small quantities of water to wells from fractures and joints (The Mark Group, 1987; after Robson, 1972). Slade (1986; 1988) did not consider these rocks to be part of the groundwater reservoir in the Santa Clara River valley, based on their lack of primary porosity, limited storage capacity, and low yield potential.

Sylmar Basin Subarea: Non-water bearing deposits and aquitards in the Sylmar Basin Subarea are similar to that of the Eastern Hydrographic Subarea discussed above, and include Tertiary sedimentary rocks and crystalline basement rocks. In the Sylmar Basin Subarea, the main recognized non-water bearing sedimentary units are the early Pliocene-age Repetto Formation (Towsley equivalent; Figure 6A, San Fernando Area) and the Pico Formation (Brown, 1975). The Repetto is variable in thickness (400 to 3,000 feet) and generally comprised of interbedded mudstone, siltstone, sandstone and conglomerate. The Pico Formation is thinner than equivalent deposits in the Ventura Basin area (1,500 to 3,000 feet) and is a mudstone to siltstone with lenses of sandstone and conglomerate (Brown, 1975). Crystalline basement rocks are identical to those of the Eastern

Hydrographic Subarea described above. These rocks form the northern faulted boundary of the Sylmar Basin.

8.3 REGIONAL GROUNDWATER FLOW MODEL

8.3.1 Groundwater Flow Direction

Eastern Hydrographic Subarea: As mentioned in Section 8.1, groundwater flow within the Santa Clara River Basin is dominantly to the west following the Santa Clara River drainage course toward the Pacific Ocean. In the Eastern Hydrographic Subarea, groundwater flow occurs within two primary aquifers, consisting of alluvium under water-table conditions and Saugus Formation under confined conditions. In both cases, flow direction follows the Santa Clara River drainage, but varies according to topography and orientation of the various tributaries contributing to regional groundwater flow (Slade, 1986; 1988). In the Newhall-Saugus area, groundwater flow in both aquifers is toward the north-northwest, following the drainage course of the South Fork of the Santa Clara River and its contributing drainages (Slade, 1986; 1988).

Sylmar Basin Subarea: Groundwater flow in the Sylmar Basin Subarea is separated from that of the San Fernando Basin by a subsurface barrier approximately coinciding with the Mission Wells and Sylmar fault segments of the San Fernando fault zone. Outflow from the Sylmar Basin to the San Fernando Basin apparently occurs at the Sylmar Notch near Mission Wells and the Pacoima Notch near Lopez Dam (Brown, 1975).

Within the basin, groundwater flow can be divided into an eastern portion and a western portion. The division between these two parts occurs along a topographic divide that extends northward from the northernmost tip of Mission Hills toward the San Gabriel Mountains near Foothills Boulevard (Brown, 1975). General groundwater flow direction in the eastern part of the subarea is from north to south from the vicinity of Pacoima Wash to the southern subarea boundary. Flow in the western part is from northeast to southwest toward the Van Norman reservoirs.

8.3.2 Flow Conditions, Recharge and Discharge

Eastern Hydrographic Subarea: In general, water table conditions appear to prevail throughout the alluvial sediments within the Eastern Basin, although semi-perched, semi-confined, and confined conditions may exist locally (Slade, 1986). The range in groundwater conditions is a result of the interaction of the stratigraphy and structure. Differences in the location and elevation of the recharge areas for different water-bearing units also produces vertical gradients between permeable zones. Groundwater within the Saugus Formation is generally under confined (artesian) conditions within the Eastern Hydrographic Subunit (Slade, 1988).

Natural recharge sources to groundwater reservoirs within the alluvial aquifer system include: deep percolation of direct precipitation; infiltration of stream runoff in the river valley and its tributaries; subsurface inflow, depending on water levels from the adjoining hill and mountain areas; and subsurface inflow from the upstream basins (Slade, 1986). The relative magnitude of these sources is not well known (Slade, 1986). Outflow or discharge from the alluvium within the Eastern Basin occurs principally by water well extractions for production, including agricultural, domestic (individual houses), and industrial and/or commercial establishments (Slade, 1986). Additionally, discharge is known to occur by west-directed, subsurface outflow to the downgradient Piru Hydrographic Subunit. Subsurface outflow also occurs, depending on water levels, into the underlying permeable portion of the Saugus Formation, and by evapotranspiration in areas of phreatophytes that grow in the far reaches of the Santa Clara River valley (Slade, 1986).

Recharge sources to the Saugus Formation principally include: 1) infiltration of direct precipitation at outcrop areas; 2) deep percolation of groundwater from the saturated portion of the alluvium into Saugus strata; and 3) subsurface inflow from the older rocks adjoining Saugus strata (Slade, 1988). The potential recharge from direct precipitation on exposed Saugus strata and direct infiltration from overlying alluvium have been estimated to range between approximately 20,000 to 22,000 acre-feet per year in wet periods and 11,000 to 13,000 acre-feet per year in dry periods (Slade, 1988). The quantity of recharge to Saugus strata from older rocks is not known due to the lack of sufficient data.

Outflow or discharge from the Saugus Formation occurs principally by water well extractions and subsurface outflow to downstream strata. In addition, subsurface outflow to older beds below the Saugus Formation, mainly into the more permeable units in the upper Pico Formation, likely occurs. Production from Saugus wells within the Santa Clara River valley in the Eastern Hydrographic Subarea from 1954 to 1988 averaged about 4,660 acre-feet per year (Slade, 1988). Subsurface flow to older strata has not been quantified due to the lack of sufficient data. Evapotranspiration from areas of high groundwater or from areas of phreatophytic growth from Saugus strata is considered negligible (Slade, 1988).

Groundwater present in the underlying consolidated and cemented sedimentary formations and crystalline formations is principally under artesian conditions (Slade, 1988). These formations, which are generally exposed along the topographically elevated areas within the subject basins, receive recharge from infiltration of precipitation or from subsurface outflow from overlying permeable formations. Discharge of groundwater is likely to occur by water well extraction, subsurface flow to underlying and/or overlying hydraulically connected permeable formations, and through springs and seeps in topographically low areas.

Sylmar Basin Subarea: The alluvial aquifer is under unconfined, water-table conditions, whereas a confined system exists within the Saugus Formation aquifer (Brown, 1975), in the Sylmar Basin Subarea. However, based on decline in the water-table aquifer observed coincident with heavy pumping of Saugus wells in the Mission well field, the unconfined alluvial aquifer is in hydraulic conductivity with the confined aquifer, at least in this area (Brown, 1975).

In the Sylmar area, recharge to alluvium occurs by direct infiltration of precipitation and surface runoff from the San Gabriel mountain front areas. The exact location and extent of the recharge area for the confined Saugus Formation aquifer is not definitely known, but alluvial deposits within Pacoima Wash have been inferred to be a primary recharge area, based on the downward slope of the water table groundwater surface from this area toward lower portions of the subarea (Brown, 1975). In addition, deep percolation from precipitation and applied water, and surface water runoff from highland areas are also believed to be primary recharge sources (Brown, 1975).

Groundwater outflow from the Sylmar Basin occurs by: 1) direct pumping from areas such as the Mission wells field and; 2) limited subsurface outflow to the San Fernando Basin. A subsurface groundwater barrier due to faulting forms the hydrologic boundary between the Sylmar and San Fernando Basins. Prior to construction of Lower Van Norman Dam in 1913, stream deposits in the western portion of the Sylmar Basin Subarea provided an avenue of exit of subsurface water from this area. However, since completion of this reservoir and Upper Van Norman Reservoir in 1921, the naturally occurring subsurface outflow has essentially been cut off for practical purposes (Brown, 1975). Further, according to Brown (1975), a limited amount of subsurface outflow only takes place at Sylmar Notch, near the Mission well field, and Pacoima Notch, near Lopez Dam. This outflow apparently occurs as subsurface flow cascading over the fault trace and truncated impermeable units.

8.3.3 Water Level Fluctuations

Prior to about 1960, the CDWR (1964) reported that water level data from wells located near Castaic Junction and in the downstream portion of the Newhall-Saugus area exhibited only minor fluctuations over a 30-year time span. However, water levels at wells in the upstream portion of the Santa Clara River valley were reported to have declined by 40 to 100 feet below previous levels (CDWR, 1964). Data for 1985 indicated water levels ranging from 35 to 60 feet bgs in the area of the South Fork of the Santa Clara River, and between 10 and 25 feet bgs within the main river drainage in the lower portion of the subunit (Slade, 1988).

Hydrograph data after about 1960 for wells screened within alluvium, Saugus Formation, and screened over both units (combination wells) were reviewed by Slade (1986) to assess groundwater storage due to changes in basin-wide recharge and discharge within the upper Santa Clara River Basin. Hydrographs indicated that changes in groundwater storage occur both within the short-term (seasonal) and in the long-term (period of several years). Such changes occurred rapidly and to a greater degree in wells screened in the alluvium (Slade, 1986). Groundwater level fluctuations were significantly less pronounced in the wells screened in the Saugus Formation and the combination wells (Slade, 1986). According to Slade (1988), it is possible that the less pronounced changes in the Saugus Formation aquifer and combination wells may be because: 1) the aquifer is generally under confined conditions; 2) presumably large quantities of groundwater are in storage; and 3) there are a limited number of wells tapping this aquifer as a source of supply. According to Slade (1988), water level fluctuation in response to infiltration of direct precipitation or runoff was observed to be rapid regardless of the location of alluvium wells along the Santa Clara River.

Piezometric fluctuations in selected non-pumping wells screened within the Saugus Formation in the Eastern Basin region from approximately 1961 to 1987, averaged 20 feet to 40 feet, apparently in response to seasonal effects. A maximum fluctuation of about 160 feet was observed in one well (Slade, 1988).

Piezometric data from Saugus wells in the Eastern Hydrographic Subarea south of the Holser fault indicated elevations of 50 feet to 100 feet above those for 1967, which was a generally low water level period (Slade, 1988). The degree to which this fault system influences groundwater flow in the Saugus Formation reportedly is not certain (Slade, 1988), but it appears at least to be a partial barrier to groundwater flow in the deeper portions of the Saugus. Finally, on a local scale, water levels measured between 1985 and 1987 in wells located within the Newhall region (specifically, the Newhall Refinery) indicated fluctuations of 5 feet to 7 feet (The Mark Group, 1987).

Sylmar Basin Subarea: Groundwater contours for 1988 indicated water levels to be on the order of 50 to 100 feet bgs in most of the Sylmar area (Blevins, 1989). Historically, near-surface groundwater conditions were reportedly present within several areas of the basin in the early 1900s, but levels have subsequently declined due to pumping (Brown, 1975). Based on water level data for the eastern portion of the Sylmar Basin available in 1971, water levels declined approximately 80 feet from historic high-water levels observed in 1944-1945 (Brown, 1975). This has been as a direct result of pumpage and export of water from the Mission well field to the San Fernando area, exceeding natural and imported water recharge to the Sylmar area.

8.3.4 Regional Aquifer Parameters

Eastern Hydrographic Subarea: Because there are essentially no available aquifer test data for alluvial aquifers in the Eastern Hydrographic Subarea, theoretical estimates of aquifer parameters of transmissivity (T) and hydraulic conductivity (K) have been derived for these deposits (Slade, 1986). In these calculations, values of well yield (Q, in gallons per minute (gpm)) and well drawdown (s) were estimated from drillers' logs or from efficiency tests performed on local wells by the Edison Company. Areas of high T values (> 500,000 gallons per day per foot (gpd/ft) and low T values (< 12,000 gpd/ft) were identified in the area using this approach (Slade, 1986).

Based on calculation of theoretical parameters, areas of alluvium within the Eastern Hydrographic Subarea with largest T values (500,000 to 600,000 gpd/ft.) and large hydraulic conductivities (as high as 7,000 gpd/ft^2 or 0.3 centimeters/second (cm/s)) coincided with the central portions of the Santa Clara River channel. Within the river alluvium itself, greatest values of T and K were interpreted to occur in the main reach west of Bouquet Canyon. In general, with the exception of Castaic Creek, smaller tributaries were estimated to have lower T and K values. Significantly different values of these parameters seen in wells within close proximity to one another were attributed to either exceptionally clean, well-sorted sand/gravel deposits in cases of high values, or well construction/well efficiency where extremely low T and K values occurred (Slade, 1986).

Available aquifer test data from wells screened within the Saugus Formation within the Eastern Hydrographic Subarea indicated that transmissivity values range from lows of approximately 3,000 to 4,100 gpd/ft to highs of approximately 157,000 to 182,000 gpd/ft (Slade, 1988). Transmissivity values were observed to increase toward the center of the Saugus Formation structural basin and the area of younger Saugus Formation strata. Storativity of the Saugus Formation was reported to be relatively low (7.6×10^{-4} to 9.1×10^{-4}), as representative of a confined aquifer system (Slade, 1988).

8.4 REGIONAL GROUNDWATER QUALITY

Eastern Hydrographic Subarea: Groundwater quality of alluvial aquifers within the Eastern Hydrographic Subarea adjacent to the Santa Clara River valley were reported to range from a calcium-bicarbonate character within the eastern, or upgradient, areas to a degraded sodium-sulfate character within the western, or downgradient, area of the region (Slade, 1986). Generally, TDS increases in the downgradient direction within the river valley. These increasing TDS values were attributed to irrigation returns, evapotranspiration, and discharges of treated sewage effluent (Slade, 1986).

Water quality data were collected for three water production wells located west and northwest of the project property (Janes, 1991). Two of the wells, located approximately one-half mile west and one mile north of the project property, are located in alluvial deposits of tributary canyons to the Upper Santa Clara River. One well, located approximately two miles northwest of the property, is screened in alluvial deposits of Newhall Creek near downtown Newhall. Groundwater quality from these wells is characterized by moderately elevated total dissolved solids (i.e., 372 to 623 mg/l) and slightly alkaline pH (i.e., 7.8 to 8.0) conditions. Metal and inorganic salt concentrations are variable, possibly related to the relatively close proximity of the wells to petroliferous bedrock areas (Janes, 1991). Groundwater from the well located to the north of the project property and downgradient of the Placerita Oil Field, reportedly contains a relatively high boron concentration (i.e., 1,900 micrograms per liter (ug/l) (Janes, 1991). Groundwater from the production well located to the west of the property, which is in a narrow canyon adjacent to outcrops of the Pico Formation, contains iron concentrations five times greater than the other two production wells (Janes, 1991).

Generally, groundwater quality observed in Saugus Formation wells located adjacent to the Santa Clara River valley ranges from either a calcium-bicarbonate or calcium-magnesium-sulfate character. Groundwater quality data from the late 1950s to 1985 for seven selected wells within this region indicated generally high TDS values ranging from approximately 500 to 1,260 mg/l. These TDS values have apparently increased with time (Slade, 1988).

Most of the oil and gas production in the Eastern Hydrographic Subarea occurs from reservoirs in geologically older formations stratigraphically underlying the Saugus Formation (Slade, 1988). However, production from relatively shallow reservoirs have been reported from fields located within the Santa Clara River valley in the basal part of the Saugus Formation and/or reservoirs in the upper part of the Pico and/or Towsley Formations (Slade, 1988). Groundwater wells drilled in the vicinity of oil fields and completed within the lower strata of the Saugus Formation typically contain petroleum hydrocarbon constituents or groundwater with relatively high salinities (Slade, 1988).

According to Slade (1988), data obtained from the CDOG indicated that most of the wastewater from oil field operations is re-injected into the underlying rock formations via wastewater injection wells. However in the past, wastewater was reported to have been discharged into ponds and allowed to evaporate and/or percolate into underlying strata, or had been discharged into local drainage channels (such as at the Placerita Oil Field).

Sylmar Basin Subarea: In general, groundwater within the Sylmar Basin Subarea, as well as the entire Upper Los Angeles River Basin, is hard to very hard, and groundwater character reflects the composition of the surface runoff in the area (Blevins, 1989). Within the Sylmar Basin, groundwater is of a calcium-bicarbonate type. Typical TDS values range from about 200 to more than 400 mg/l, based on selected well data from 1985 and 1988 (Blevins, 1989).

8.5 REGIONAL GROUNDWATER USE

8.5.1 Groundwater Use Designation

Eastern Hydrographic Subarea: Groundwater within the Eastern Hydrographic Subarea is designated as having existing beneficial uses for municipal and domestic supply, industrial service and process supply, and agricultural supply (RWQCB, 1975a). No potential beneficial uses are in effect for groundwater in this subarea.

Sylmar Basin Subarea: Groundwater in Sylmar Basin Subarea, as well as all of the Upper Los Angeles River Area, has been established as being of existing beneficial use for municipal, agricultural, and industrial service and process supply purposes (RWQCB, 1975b).

8.5.2 Groundwater Quantity

Eastern Hydrographic Subarea: Groundwater storage in the alluvium within the Eastern Groundwater Basin of the Santa Clara River valley has been calculated at approximately 176,400 acre-feet (Slade, 1986). Useable groundwater in storage within the Saugus Formation underlying a large portion of the Santa Clara River valley area was calculated to be approximately 1.41 million acre-feet (Slade, 1988). This approximation was based on the volume of groundwater stored only in the potentially useable Saugus aquifers in the 500-foot to 2,500-foot depth zone (Slade, 1988).

Sylmar Basin Subarea: Data for 1988 reported groundwater storage of approximately 310,000 acre-feet for the confined aquifers of the Sylmar Basin Subarea (Blevins, 1989). These same data indicated a +371 acre-feet change in storage for 1987-1988 compared to a cumulative storage change from 1954-1955 through 1987-1988 of -21,575 acre-feet.

8.5.3 Groundwater Production

Eastern Hydrographic Subarea: Water use within the Upper Santa Clara River valley, which encompasses much of the Eastern Hydrographic Subarea, was projected by the

CDWR (1964) to decline for agricultural use over the next 30 years (through approximately 1990), but to increase at a greater rate for urban water use. In 1970, total water demand in the Santa Clara River Basin was 345,040 acre-feet (RWQCB, 1975a). Of this total, 247,870 acre-feet was used by agriculture and 97,170 acre-feet was consumed by municipal, industrial, and other users (RWQCB, 1975a).

In 1985, a total 24,103 acre-feet of water was pumped from shallow (less than 200 feet) production wells completed in alluvial deposits. Of these wells, the Newhall Land and Farming Company pumped nearly 50 percent, followed by Santa Clarita Water Company with about 19 percent. Newhall County Water District, Valencia Water Company and Los Angeles County Waterworks District No. 36 were reported to operate the balance of alluvium production wells (Slade, 1986, Table 2). In addition to large production wells, private wells completed within shallow alluvium exist throughout the Santa Clara River valley. However, production rates for these wells were not reported (Slade, 1986). In total, the quantity of groundwater produced from alluvial deposits was reported to be approximately five times greater than from the Saugus Formation (Slade, 1986).

In 1985, approximately 4,892 acre-feet of water was pumped from production wells completed in the Saugus Formation within the Eastern Basin of the Santa Clara River valley, followed by about 5,532 acre-feet produced in 1986. In total, approximately 153,820 acre-feet of water has been pumped from water wells installed in the Saugus Formation within the Santa Clara River valley from 1954 to 1986 (Slade, 1988). The largest producers of this volume were the Newhall County Water District (approximately 65 percent of total) and the combined production of the Newhall Land and Farm Company and Valencia Water Company (approximately 35 percent of total). Historically, Saugus Formation wells within the Santa Clara River valley have ranged in depth, where known, between approximately 370 feet and 2,000 feet. Most wells are in the general depth range of 1,000 feet to 1,500 feet.

In 1991, approximately 35,812 acre-feet was pumped from local wells completed in alluvium and the Saugus Formation (Berdiansky, 1992; Maupin, 1992; Manetta, 1992; Warner, 1992; Core, 1992). These quantities do not include production from numerous small private wells, and portions of the Upper Santa Clara River Basin for which recent data were not readily available. The quantity of groundwater withdrawal from these wells is not known, but believed to be relatively small.

Sylmar Basin Subarea: The major portion of the land area within the Sylmar Basin lies within corporate limits of the City of Los Angeles. Water supply for the City of Los Angeles, Sylmar District is obtained from the Owens River Aqueduct. All of the pumpage from the City's Mission well field is exported from the Sylmar Basin Subarea to the San Fernando Basin Subarea (Brown, 1975).

In water year 1987-1988, a total of 5,937 acre-feet of groundwater was produced from the Sylmar Basin, with about 5,685 acre-feet of this amount delivered to the San Fernando Basin Subarea. Of the total production, approximately 3,134 acre-feet were pumped from the City of Los Angeles Mission well field, and 2,804 acre-feet were extracted at the City of San Fernando well field near Hubbard Street. The subarea received approximately 11,281 acre-feet of imported water from the Owens River aqueduct (Blevins, 1989).

9.0 LOCAL HYDROGEOLOGIC SETTING

The following discussion of the hydrogeologic setting of the project property is based on: 1) geologic and hydrogeologic data obtained as a result of site investigation in 1991 (Janes, 1991); and 2) additional hydrogeologic data collected in 1992, as contained in Appendices C through E to this report.

Hydrogeologic investigation performed in 1991 included the following major tasks: 1) drilling, coring and installation of 36 monitoring wells including 13 well pairs (shallow and deep); 2) open-hole packer testing (constant head and pressure decay); 3) slug testing in completed wells (falling and rising head); 4) laboratory core permeability testing (horizontal and vertical); 5) water level monitoring in wells; and 6) groundwater and surface spring sampling and analytical testing. Boring logs, well-completion diagrams, testing methods, and data obtained are presented in the 1991 database report (Janes, 1991).

Additional hydrogeologic investigation performed in 1992 included: 1) springs/seeps mapping to supplement 1991 data; 2) drilling, coring and installation of five groundwater monitoring wells at the project property (wells C-17A, C-18A, MW-23B, MW-24, and MW-25; Plate 7A); 3) open-hole packer testing; 4) slug testing of one well; 5) bi-weekly and monthly water level measurements in all monitoring wells at the property; and 6) two periods of groundwater/surface spring sampling and analytical testing.

Data collected during the 1992 effort and presented in Appendices C through E to this report include boring logs and well completion diagrams for the five additional wells (Appendix C), methods and results of all packer and slug testing (Appendix D), and water level measurements and well hydrographs from March, 1992 to September, 1992 for all site monitoring wells (Appendix E). A summary of drilling methods, installation dates, well-completion data, and zone of completion for all monitoring wells is presented in Table 4. Analytical testing data for two periods of groundwater and springs sampling are contained in two separate reports prepared by Meredith/Boli & Associates (1992a; 1992b).

The occurrence of groundwater at the project property is summarized in Section 9.1, followed by a discussion of groundwater flow conditions in Section 9.2. Water quality data is summarized in Section 9.3, and a summary of the local conceptual groundwater flow model is presented in Section 9.4.

9.1 GROUNDWATER OCCURRENCE

In many groundwater assessment studies that focus on groundwater production or production potential, hydrogeologic units are typically defined and characterized in terms of their known or potential ability to produce groundwater in quantities that would be suitable for agricultural, commercial, or multi-user domestic purposes (typically wells producing 200 gallons/day or more). Using such a definition, none of the rock units present at the project property would likely qualify as aquifers capable of yielding usable amounts of groundwater, based on their hydraulic conductivities and expected sustained yields. There are no groundwater production wells on the property. In order to characterize the local hydrogeologic setting, hydrogeologic units are defined by their relative porosity/permeability properties, and in terms of the local occurrence and flow of groundwater within these units.

Hydrogeologic units recognized at the project property and the occurrence of groundwater are summarized in Section 9.1.1 below. Discussion of hydraulic properties of these units obtained from hydraulic testing data follows in Section 9.1.2.

9.1.1 Hydrogeologic Units

Data obtained during site investigation in 1991 identified four principal hydrogeologic units at the project property (Janes, 1991). These include the San Gabriel Formation, Eocene

Rocks, Towsley Formation, and alluvial sediments. Detailed lithologic descriptions of these units are presented in Section 5.0. Information presented below pertains to the hydrogeologic characteristics of the above-mentioned units.

Groundwater was not encountered in the Pico Formation during investigation conducted at the project property, possibly due in part to its topographic position. Therefore, the Pico is not considered to represent a significant water-bearing hydrogeologic unit at the property.

San Gabriel Formation: The San Gabriel Formation consists of dense, crystalline basement rocks of igneous and metamorphic origin which underlie the topographically steep rugged eastern portion of the project property, including the ridgeline traversed by East Firebreak Road (Plates 7A and 7B). Nearly all of the proposed landfill footprint will be underlain by these rocks. Based on surface mapping and subsurface drilling information, San Gabriel Formation rocks are very hard and the weathered zone is typically a few feet thick. For all practical purposes, the San Gabriel Formation contains little primary porosity, if any, based on appearance and hydraulic testing data. However, these basement rocks have been moderately to highly fractured, resulting in secondary fracture porosity and likely, highly variable water-bearing characteristics. In addition, some minor porosity may exist within foliation and schistosity planes in gneissic (metamorphic) rocks.

A total of 21 groundwater monitoring wells ranging in depth from 23 feet to 500 feet bgs were drilled and installed in San Gabriel Formation rocks. Included within this well group are 5 well pairs (Table 5). Groundwater was encountered as deep as 450 feet bgs in one well (C-17A) and flowing to the surface in three of these basement wells (C-1, C-3 and MW-5, Plates 7A and 7B). Mapping performed in May 1992, approximately two months after a period of significant precipitation, documented the presence of springs and seeps within San Gabriel Formation rocks exposed in upper drainages flanking the East Firebreak Road ridgeline area.

Eocene Rocks: Eocene rocks occurring at the project property are well-indurated and cemented medium to coarse-grained sandstone with minor siltstone and conglomerate interbeds. A total of 6 groundwater monitoring wells were completed within Eocene rocks, and groundwater was encountered at depths ranging from 10 feet to 215 feet bgs. Included in this group are one well pair (MW-1/MW-2), and a second well pair with a deep Eocene completion (C-13) and a shallow alluvium completion (C-14) (Table 5). Groundwater reportedly occurs within primary and secondary (mainly fracture) porosity in Eocene rocks (Janes, 1991).

Towsley Formation: The Towsley Formation consists of siltstone, silty sandstone, and very fine-grained sandstone, and was mapped as two members (Janes, 1991). The lower member is typically a massive bedded, fine to medium-grained, well indurated sandstone, while the upper member is predominantly comprised of siltstone. A total of 11 monitoring wells were completed within the Towsley Formation, and groundwater was encountered at depths ranging from 67 feet to 447 feet bgs. This well group includes 4 well pairs. Also included is MW-6B, a shallow companion Towsley well to deep well MW-6A, which is completed in San Gabriel Formation (Table 5; Plate 7A).

With the exception of well C-9 (Plate 7A), all wells completed in the Towsley Formation encountered groundwater within the lower member. Well C-9, the shallow completion of Towsley well pair C-9/C-10 (see Section 9.2.2 below), is screened within a sandstone bed in the upper member, whereas adjacent well C-10 is completed in the lower Towsley member (Plate 2; cross-section C-C'). Based on water levels observed in the two wells (approximately 67 feet bgs in C-9 versus approximately 129 feet bgs in C-10) and significantly differing water quality (well C-10 is oil-impacted; see Table 6 and Section 9.3 below), the two wells are not in hydraulic communication, and well C-9 monitors perched water in upper Towsley beds.

Pico Formation: The Pico Formation, consisting of coarse-grained sandstone and conglomerate, overlies the Towsley Formation, and outcrops occur in the western areas of the project property. Two monitoring wells were completed in the Towsley Formation (C-12 and MW-16, Plate 7A), and drilled through a limited section of Pico deposits, but did not encounter groundwater in this interval.

Alluvium: Mappable alluvial deposits occurring within primary drainages consist of unconsolidated sandy silt, silty sand and gravelly sand, with minor amounts of clay. Three monitoring wells installed in alluvial material (C-14, and well pair MW-17/MW-22, Plate 7A) encountered groundwater at depths ranging from 4 feet to 13 feet bgs. Recent monitoring data (Plate 7A) indicated well MW-17 to be dry and declining water levels occurring in the other two wells, suggesting that alluvial aquifers are ephemeral in localized areas of the site.

9.1.2 Porosities and Hydraulic Conductivities

Among other factors, hydraulic conductivity of a hydrogeologic unit is influenced by its effective porosity, or degree to which pore spaces are interconnected, and its effective permeability. Porosity takes two forms in the water-bearing formations at Elsmere Canyon: intergranular and fracture porosity. Intergranular or primary porosity (i.e., formed when rocks formed) occurs in Eocene rocks and Towsley Formation. Intergranular porosity essentially does not exist in the San Gabriel Formation. Fracture porosity or secondary porosity (i.e., developed in the rocks later) occurs in all three rock units.

Primary porosity in Eocene rocks and Towsley Formation was measured as a percent of bulk volume in rock core samples (Janes, 1991). Eocene rocks have very low porosities ranging from 5% to 9%, because these rocks are well indurated, and much of the original pore spaces have been infilled by cementation. Towsley siltstone and fine-grained sandstone have much higher primary porosities (i.e., 29% to 33%), but effective permeability is limited by their fine-grained nature leading to very small and poorly connected pore spaces. Permeability (and hence, hydraulic conductivity) of the formation as a whole is reduced further by interbedded claystone layers and by natural tar that fills pore spaces in sandstone of the lower member.

More than 95% of the landfill footprint will overlie rocks of the San Gabriel Formation. Hydraulic conductivity of this unit is exclusively controlled by density and orientation of fractures which make up all of the formation's effective porosity. Fractures in the San Gabriel Formation are common, randomly oriented, cross-cutting and generally open, although some infilling has occurred (Janes, 1991). Within this randomly oriented fracture network, groundwater flow could occur in any direction and would be most efficient in directions along larger and more open fractures and where fracture density is increased. In such areas, hydraulic conductivity is greater, but the overall direction of groundwater flow within the hydrogeologic unit is primarily influenced by topographic conditions and locations of recharge and discharge areas, as discussed in later sections.

Hydraulic conductivity values discussed below are based on testing performed by the following three methods: 1) open-hole packer testing by constant head (where possible) and pressure decay methods; 2) slug testing (rising head and falling head) of completed wells;

and 3) laboratory permeability testing of core samples (vertical and horizontal directions). The methodology and results of testing by the first two techniques (packer and slug testing) is presented in Appendix D of this report and includes all such testing performed to date (1991 and 1992). Table D-1 of Appendix D summarizes open-hole packer testing results, and Table D-2 of Appendix D presents the results of slug testing in completed wells.

The 1991 report contains an appendix of packer and slug testing data performed up to that time (Janes, 1991). The 1991 report also contains all laboratory permeability testing results for core samples.

San Gabriel Formation: A total of 15 open-hole, constant-head packer tests were conducted in open borings (C-7A, C-18A and MW-23A, Plate 7B) drilled in San Gabriel Formation rocks (Table D-1, Appendix D). The injection flow rates used to maintain constant head ranged from about 15 gallons/hour (gph) to 65 gph. From these data, in-situ hydraulic conductivity values calculated for basement rocks were generally consistent and ranged from about $7x10^{-5}$ cm/sec to $3x10^{-6}$ cm/sec. Calculated transmissivities ranged from less than one gallon per day/foot (gpd/ft) to nearly 10 gpd/ft. Five slug tests (three falling head, two rising head) were performed in wells completed in the San Gabriel Formation (monitoring wells C-7A, MW-10 and MW-13, Plate 7B). In general, hydraulic conductivities derived from these data were consistent with packer testing results, although slightly greater values in the 10^{-4} cm/sec range were calculated from tests performed in well MW-10. Calculated transmissivities were also comparable to those of packer testing, but ranged as high as about 300 gpd/ft in one test conducted in well MW-10.

Eocene Rocks: Three packer tests (constant head) were performed within open borings drilled in Eocene rocks (Table D-1, Appendix D). In-situ hydraulic conductivity values derived from these tests generally ranged from $8.3x10^{-5}$ cm/sec to $8.4x10^{-6}$ cm/sec. Overall, hydraulic conductivity values were orders of magnitude larger than laboratory values obtained in core permeability testing, which averaged $5x10^{-9}$ cm/sec (Janes, 1991). Since packer testing covers a greater interval than core sample permeability testing, in-situ values are likely indicative of secondary porosity development (i.e., fractures), and are believed to be more representative of the average hydraulic conductivity for Eocene rocks. Transmissivities derived from packer testing were as low as $2x10^{-4}$ gpd/ft (boring C-11) to more typical ranges of 2 gpd/ft to 20 gpd/ft.

In addition to the above-described testing, slug tests (one falling head and one rising head) were conducted in monitoring well C-16, which was directionally drilled in the Eocene section within the interpreted fault zone of the Whitney Canyon fault and screened in this interval (Janes, 1991). The test interval included Eocene rocks which may either be within close proximity or in contact with San Gabriel Formation (Janes, 1991), although lithology indicative of basement rocks was not observed during logging of the boring. The results of these tests were reported at $2x10^{-4}$ cm/sec and $9.3x10^{-5}$ cm/sec. These data suggest hydraulic conductivity within Eocene rocks may have been locally enhanced as a result of fracturing near or within the fault zone.

Towsley Formation: Nine packer tests (8 pressure decay and one constant head) were conducted within the Towsley Formation in open borings (C-11, C-12 and C-15) (Table D-1, Appendix D). In-situ hydraulic conductivity values for Towsley rocks were considerably lower than testing results for other hydrogeologic units, ranging from $6.5x10^{-8}$ cm/sec to $1.6x10^{-10}$ cm/sec. Similar laboratory values were obtained in horizontal and vertical core permeability testing, ranging from $6x10^{-8}$ cm/sec to $3x10^{-10}$ cm/sec (Janes, 1991).

Testing of Combined Hydrogeologic Unit Intervals: A constant head packer test performed over the lower Towsley-San Gabriel Formation contact in boring C-15, yielded a hydraulic conductivity of $4.1x10^{-5}$ cm/sec. This value is comparable to hydraulic conductivities typical of San Gabriel Formation; the contact may have been highly fractured in this case, based on lack of core recovery from this interval during drilling (Janes, 1991).

9.2 GROUNDWATER FLOW

Groundwater flow direction and principal groundwater divides present at the project property are summarized in Section 9.2.1. This is followed by a discussion of recharge and discharge areas and flow conditions in Section 9.2.2. Water level fluctuation trends observed in site wells are presented in Section 9.2.3. The relationship between groundwater flow and the Whitney Canyon fault is discussed in Section 9.2.4.

9.2.1 Groundwater Elevation, Flow Direction and Divides

An interpretation of the groundwater flow direction at the project property that includes water level data from San Gabriel Formation, Eocene rocks, Towsley Formation and alluvium is shown on Plate 7A. Plate 7B shows only water level data for the San Gabriel Formation, and therefore depicts groundwater flow direction for most of the area that would be overlain by the landfill footprint.

Based on static measurements from monitoring wells (Janes, 1991, Meredith/Boli & Associates, 1992a and 1992b), the groundwater potentiometric surface at the project property generally appears to follow the overall topography of the ground surface (Plates 7A and 7B). Groundwater levels are highest along the East Firebreak Road ridgeline at approximately 2,700 to 2,800 feet above mean sea level (msl), and are less than 1,500 feet above msl along the lower drainages of Elsmere Canyon in the northwest portion of the project property. In general, groundwater occurs at greatest depths below ground surface along the main ridgeline. Groundwater is also deeper at topographically higher areas surrounding the Elsmere Canyon drainage on the north, south and west, and is usually shallow in the lower portions of the Elsmere Canyon drainage where local seeps and springs may be present. Groundwater is near surface and also flows at the surface as springs and seeps at several other locations at the project property, and a few groundwater monitoring wells experience continuous flowing or near-flowing conditions (C-1, MW-3, C-3 and MW-5). These areas generally are located within small drainages on crystalline basement about 500 to 600 feet topographically below the East Firebreak Road ridgeline.

Groundwater flow direction at the project property is predominately to the northwest, from higher areas along East Firebreak Road ridgeline toward the lower portion of Elsmere Canyon (Plate 7A). However, groundwater flows to the southwest in a localized southern portion of the property. Groundwater contours defined by wells and well pairs drilled along the ridgeline and supplemented by springs/seeps mapping information, indicate that East Firebreak Road ridgeline is a major groundwater divide in the area. Northwest and downslope of this divide in the central portion of the project property, the groundwater gradient is relatively uniform toward the northwest at about 0.25 (ft/ft) or 1,320 ft/mile, and with a similar gradient to the southwest along the southern end of the divide. Downgradient of the north and south Elsmere Canyon confluence, groundwater contours bend into a more constricted U-shaped configuration that approximates the topographic relief surrounding the lower canyon reach (Plate 7A). This localized basin is defined to the north by well control along Whitney Ridge and to the south by an interpreted groundwater divide in the area of wells C-8, C-9, and C-10. The overall gradient within the lower canyon reach is still to the northwest at about 0.2 (about 1,050 ft/mile), but locally varies from north-directed to south-directed.

In the southern portion of the project property, groundwater flow is more toward the west and southwest, and a broad groundwater divide has been interpreted in the region of wells C-8, C-9, and C-10 (Plate 7A). This area roughly coincides with a topographically irregular west-trending ridgeline. Based on well control, a second U-shaped, southwest-directed groundwater flow configuration similar to the northwest-directed one described above, has been interpreted along the southern project boundary.

9.2.2 Recharge/Discharge Areas and Flow Conditions

Eleven well pairs, consisting of one shallow well (screened within the upper portions of water-bearing intervals) and one deep well (screened within the lower portions of water-bearing intervals) were installed to identify recharge and discharge areas at the project property (Plate 7A). The monitoring well database was also supplemented by springs/seeps mapping to identify discharge areas. Table 5 summarizes completion intervals and other details for these pairs. Most well pairs were installed within the saturated zone of the San Gabriel Formation, with several well pairs also installed in water-bearing intervals of the Towsley Formation and Eocene rocks.

Direct recharge of natural precipitation to San Gabriel Formation rocks is limited due to steep topographic gradients, rapid surface runoff, and thin soil cover. However, areas of recharge and discharge can generally be identified based on water levels observed in well pairs (Table 5), flowing conditions observed in some wells, and locations of surface seeps and springs. Based on well-pair water levels summarized in Table 5, the northeast-trending ridgeline traversed by the East Firebreak Road is a main recharge area for much of the groundwater system at the project property. Several other topographically higher areas such as Whitney Ridge and the southern end of East Firebreak Road ridgeline area, appear to be recharge areas based on water levels.

Groundwater monitoring wells and numerous springs and seeps predominantly located in lower canyon drainages indicate discharging conditions occur in topographically lower portions of the project property. This is demonstrated by upward vertical gradients observed in well pairs MW-15/C-15, C-13/C-14, and MW-1/MW-2 (Table 5; Plate 7A). A broad area of discharge also occurs in upslope crystalline bedrock areas to the east of the lower Elsmere Canyon drainage. This area is generally defined by locations of springs and flowing wells C-1, MW-3, C-3 and MW-5, on the northwest side and approximately 500 to 600 feet topographically below the East Firebreak Road ridgeline (Plate 7B).

Based on water levels observed in well pairs, individual wells, and observations during drilling, groundwater occurring in significant water-bearing fractures in the San Gabriel Formation may be under predominantly confined, and locally, unconfined conditions. This condition was typically evidenced during drilling when fractures within the upper saturated zone yielded small quantities of water very slowly only after extended periods when drilling was temporary halted to evaluate borehole conditions. Also during drilling, confined conditions were sometimes observed when intervals of significant water influx and increased water flow occurred within borings, presumably from encountering significant water-bearing fractures below the groundwater potentiometric surface. After well installation, groundwater typically reached static conditions above intervals screened within interpreted major water-bearing fracture zones, generally stabilizing about 25 feet above well screen, as in the case of wells MW-5, MW-7, MW-8, MW-10 and MW-18 (Janes, 1991).

9.2.3 Groundwater Fluctuations

Water levels in groundwater monitoring wells were monitored on a bi-weekly basis from early April 1992 (4/10/92) to mid-September 1992 (9/16/92). These measurements are presented in Table E-1 of Appendix E and shown in well hydrographs provided in that Appendix. Water levels were also periodically monitored during the 1991 site investigation, from early 1991 to August 1991 (Janes, 1991).

Because geology and relief significantly control the recharge/discharge conditions at the project property, seasonal effects, especially periods of heavy precipitation, have significant influence on groundwater fluctuations. Water year 1990-1991 (October 1990 to September 1991) during which the 1991 investigation was conducted, experienced below-average precipitation, as evidenced by total rainfall of 12.84 inches recorded at Newhall Station (approximately 6 miles northwest of Elsmere Canyon). Furthermore, rainfall for the past several years has also been below average. In contrast, a significant amount of precipitation occurred during the 1991-1992 winter (December, January, February and March), and Newhall Station recorded 30.46 inches of rainfall during the four month period. Nearly half of this amount occurred during two storms in early February.

As might be expected, given the precipitation data above, water levels recorded during 1991 were lower than those observed during 1992 monitoring. This difference was most pronounced in wells located along the main portion of East Firebreak Road ridgeline (e.g., 40 to 50 feet in wells MW-11, C-7A and MW-10) and less so (approximately 10 to 15 feet) in wells lower along the ridgeline, such as MW-9 and MW-13.

Well Hydrograph Data - Early 1991 to August 1991: In general, most water levels in wells remained relatively stable during early 1991 to August, 1991, or declined slowly. Stable water levels typically were observed in ridgeline wells, such as those just mentioned and others located along lower ridges, such as MW-19 and MW-21 to the north and MW-8 and MW-9 to the south (Plate 7A). Declining water levels were observed in wells located in lower drainage areas of Elsmere Canyon, such as well pairs C-13/C-14, MW-1/MW-2, and pairs MW-17/MW-22. An exception to declining or stable trends was observed in wells located along the lower northwest flank of East Firebreak Road ridgeline, such as MW-3, MW-4 and MW-6B. These wells which are completed in San Gabriel Formation appeared to show steady to slightly rising water levels, although these did not reach the initial April water level readings in 1992 data.

Well Hydrograph Data - April 1992 to September 1992: Water levels beginning April 10, 1992 were higher in all project property wells than last measurements of the 1991 investigation (August 1991), indicative of the heavy winter rainfall. Although bi-weekly water level measurements for 1992 monitoring did not begin until after most precipitation ended, the effects can still be seen in the well hydrograph data from April to September, 1992 (Appendix E). These data provide opportunity to evaluate qualitative rates of infiltration and overall response of the local groundwater system to heavy precipitation, as well as seasonal trends.

The 1992 data can be grouped into three main trends that include: 1) falling water levels; 2) rising water levels; and 3) stable water levels. However, in numerous instances, one or two of these trends have been superimposed upon the overall trend, resulting in several subsets or special cases. These effects may be due to variable rates of infiltration of precipitation and/or variable rates of groundwater movement due to aquifer heterogeneities, or localized complex recharge/discharge areas at the project property. The three general trends that can be discerned in the data are discussed below.

__Falling Water Level Trends:__ Falling water levels observed in wells during 1992 are indicative of discharging groundwater conditions following recharge to the system by infiltrating rainfall. A total of 18, or over half of the monitoring wells at the project property, fit into this general trend. Of these, eight wells demonstrated only steady decline occurring from the initial April 10, 1992 to September 1992. These wells likely experienced relatively early, rapid recharge from 1992 winter precipitation such that the recharge event is not reflected in the time period covered in the well hydrographs. Most of these wells are completed in San Gabriel basement underlying the crest of the East Firebreak Road ridgeline, and include well MW-18, well pairs MW-10/C-7A, MW-11 and also well MW-12, which is located on a narrow spur trending southeast from the East Firebreak Road ridgeline (Plate 7B). Declines in ridgeline well water levels were highest of all project property wells, typically ranging from 15 to over 20 feet during the monitoring period. Further downslope, the water level in shallow well MW-6B (of well pair MW-6A/MW-6B) also steadily declined in 1992. Other wells experiencing a steady declining trend during this period included well pair MW-17/MW-22 completed within alluvium in the Elsmere Canyon drainage at the extreme northwest corner of the project property (Plate 7B).

A second group of wells within the general falling water level trend showed either: 1) initial steady conditions until decline beginning in mid-June; or 2) steady or slightly falling water levels followed by an approximate 3 to 5-week period of rising water levels in July, or earlier in May to June, then a return to declining conditions. In the first case, recharging effects may not have been significant enough to be seen or may have occurred early with higher water levels sustained for a period of time before discharging conditions became dominant. In the second case, recharge from the February/March precipitation apparently took longer to reach some areas downslope of the main drainage divide.

Wells completed in San Gabriel Formation located below the East Firebreak Road ridgeline, including MW-7, shallow well MW-3, well pairs MW-4/C-2, and shallow well MW-3 (Plate 7B), typically showed a later recharging peak occurring in July. In the middle to lower drainage areas of Elsmere Canyon, several wells and deep completions of well pairs also apparently experienced delayed recharge from the winter precipitation, followed by declining water levels. These include Towsley Formation completions, such as deep well

C-15 of well pair MW-15/C-15, and shallow well MW-14 of well pair MW-14/C-11 (Plate 7A). In the former well pair, shallow well MW-15 showed a rising trend, in contrast to that observed in deep well C-15. In the case of well pair MW-14/C-11, deep well C-11 has been oil-fouled (see Section 9.3) and usable water levels are not available (Table 5). Eocene monitoring well pair MW-1/MW-2 both showed evidence of rising water levels, or delayed recharge, occurring in July. Similarly, well pair C-13 (deep, Eocene) and C-14 (shallow, alluvium) both demonstrated relatively steady water levels until declining conditions beginning about June for the shallow well, and July for the deep well.

Rising Water Level Trends: Increasing water levels indicative of recharging conditions can be observed in 1992 well hydrograph data for six (approximately 20 %) of the project property wells. In general, these data demonstrate less variation, or smaller trends superimposed on the overall trend, than observed in declining water level group discussed above. Typically, well hydrographs either show uniform rise in water levels over the 1992 monitoring period or a relatively rapid rise occurring from early April to mid-May, with stable conditions thereafter.

Wells demonstrating uniformly rising water levels included deep well MW-13 of San Gabriel Formation well pair MW-9/MW-13, located along the slightly lower southeast end of East Firebreak Road ridge. Shallow well MW-9 of this pair experienced a relatively rapid rise in water levels in April followed by stable conditions, indicating faster recharge and equilibration than in the deeper well. Other wells indicative of slower and steady recharge (i.e., uniformly rising water levels) included MW-20, completed in the Eocene section just to the west of the Whitney Canyon fault in the central portion of the project property, and shallow well MW-15 of well pair MW-15/C-15. In the latter case, well MW-15 experienced an initial sharp decline in water levels in early May, followed by steadily rising levels thereafter. In contrast, deep well C-15 demonstrated declining water levels in July after an initial water level rise in May-June, suggesting a more complex system and lack of direct hydraulic continuity between upper and lower Eocene zones in this area. Finally, deep well MW-6A of well pair MW-6A/MW-6B showed an overall rising trend, but also appeared to show two possible discrete recharging pulses during May and July, respectively. The shallow member of this pair, MW-6B, demonstrated relatively steady falling water levels during this same time period. However, MW-6B is a very shallow completion within the Towsley Formation, and is likely monitoring perched water at the Towsley/San Gabriel Formation contact.

Stable Water Levels: Over the 1992 monitoring period, water levels have remained relatively stable in six (approximately 20%) of the project property monitoring wells. Most of these wells are located along topographically elevated ridges and areas surrounding the lower drainage areas of Elsmere Canyon, such as Whitney Ridge, Cliff Face Ridge, Pico Ridge, and the west-trending ridge north of Power Tower Hill and west of Elsmere Canyon South (Plate 7A). This group includes MW-21, MW-19, MW-16, C-8 and shallow well C-9 of well pair C-9/C-10 (deep well C-10 has been oil-fouled; see Section 9.3). Water levels in C-16, completed within the Whitney Canyon fault zone (Plate 7A), also remained stable during 1992 monitoring. Many of these ridge wells also demonstrated relatively stable conditions during 1991 (Janes, 1991). These effects are indicative of slow recharge/discharge groundwater areas that function as local groundwater divides.

In summary, several conclusions can be made with respect to water level trends observed in response to heavy precipitation of the 1991-1992 winter. First, recharge and discharge occurring first along the drainage divide traversed by East Firebreak Road, indicates that the area of this ridge is a significant recharge area at the property. Second, slope areas below the main divide experienced later recharge occurring from one to four months after the major precipitation event was over. The variable rates of later recharge occurring in the monitoring wells at these areas may be attributed, in part, to variation in the fracture network and location with respect to the main drainage divide. Third, some wells experiencing slow continuous recharge for the duration of water level monitoring are probably located in areas of lower hydraulic conductivity where the fracture network in the San Gabriel Formation is not as extensively developed. Finally, stable water levels observed in some wells are indicative of groundwater divide areas where recharge/discharge effects occur slowly due to isolation.

9.2.4 Relationship Between Groundwater Flow and the Whitney Canyon Fault

As noted earlier, fracture density increases adjacent to the Whitney Canyon fault (Section 9.1.2). Where medium and coarse-grained sedimentary deposits or crystalline bedrock are involved, this effect would be expected to locally enhance hydraulic conductivity of formational units in these areas and augment groundwater flow rates. However, there is no evidence that suggests this effect, where locally developed, alters the groundwater flow significantly from that depicted on Plates 7A and 7B. The available data indicate that topography is a major controlling factor in the overall direction of groundwater flow at the project property, and discharging conditions exist in the lower portion of Elsmere Canyon due to fracture avenues in San Gabriel Formation rocks and the hydraulic head difference between this location and elevated ridge areas such as East Firebreak Road ridgeline.

Where fine-grained deposits may affected by the WCF, such as siltstone beds in Towsley Formation, a clayey shear zone could develop along the fault plane which could locally impede or slow rates of groundwater flow. This situation is observed where the WCF crosses the Elsmere Canyon drainage at a high angle to groundwater flow direction, and the canyon essentially has cut a notch through the fault plane. At this location, a clayey shear zone has been locally developed along the fault surface between Eocene rocks and Towsley Formation (see description of the Elsmere Canyon fault trench in Section 5.4.2 and Plate 5). If this clayey zone extends at depth downward against faulted San Gabriel Formation, some local "damming" effect along the fault plane could be possible. The damming effect could be a contributing factor to the local presence of some springs and seeps that occur east of the fault in the canyon bottom. However, there is no other direct evidence to support the presence of a possible groundwater barrier along the fault plane, such as significant differences in water levels in wells located on opposites of the fault. Where a clayey shear may have developed along the fault in topographically higher areas, some damming effect and local diversion of flow could occur, but the overall flow direction would still be expected to approximately follow topography as shown in Plate 7A.

In summary, the degree of fracturing increases with proximity to the WCF, and the presence and extent of fault gouge developed along the fault plane is likely a function of juxtaposed rock type. Given these factors, groundwater flow likely follows through a locally complex path in the vicinity of the fault, but may be expected to return to the general northwest flow pattern controlled by topographic conditions and recharge-discharge areas. Under these conditions, the WCF is not believed to significantly impede the overall groundwater flow or substantially alter flow direction.

9.3 GROUNDWATER QUALITY

The following discussion and conclusions are based on hydrochemical data obtained at the project property during three periods of groundwater and surface springs sampling and analyses (Janes, 1991; Meredith/Boli & Associates, Inc., 1992a and 1992b). The testing results of these three periods are relatively consistent within individual wells. Therefore, chemical testing results for wells and springs collected during second quarter 1992 sampling (end of May, beginning of June) are provided in Table 6 as a general reference for the discussion below.

Because of the variation in lithologic and hydrologic properties of the hydrogeologic units and presence of naturally occurring petroleum hydrocarbon containing deposits in the area, concentrations of individual chemical constituents display a wide range of values between sampling points. However, concentrations of individual chemical constituents at the various sampling points have remained relatively consistent between sampling events (Janes, 1991; Meredith/Boli & Associates, Inc., 1992a and 1992b). Some general characteristics of groundwater quality at the project property and a few hydrochemical trends have been identified, as summarized below. The concentration and distribution of select analytical parameters at the project property are shown on Plate 8, which presents second quarter 1992 data. Surface springs water quality data shown on Plate 8 is from the first quarter 1992 sampling period, when more springs were available for sampling.

Groundwater quality in the eastern portion of the project property is generally good. However, groundwater has been degraded by naturally occurring crude oil hydrocarbons, locally within the west and northwest portions of the project property. Areas where groundwater has been impacted by naturally occurring crude oil and oil-related brines include the Elsmere and Tunnel areas of the Newhall Oil Field, and locally occurring tar deposits and active oil seeps (Plate 8). As an example, several monitoring wells at the project property became fouled with tar during the course of the investigation. Naturally occurring petroleum hydrocarbons were found in monitoring wells MW-1, MW-2, MW-21, C-10, C-11, and C-15 as dissolved phase, and in wells C-10 and C-11 as floating phase (Table 6; Plate 8). The above wells are nearly all located west of the Whitney Canyon fault and completed in either Eocene Rocks or lower Towsley Formation (Meredith/Boli & Associates, Inc., 1992a). In addition, groundwater west of the fault and in the Elsmere and Tunnel areas is characterized by relatively high concentrations of total organic carbon (TOC) and total petroleum hydrocarbons (TPH), and elevated chemical oxygen demand (COD) (Table 6; Plate 8). Finally, elevated concentrations of both magnesium and sodium were also detected in groundwater from Eocene rocks near the Whitney Canyon fault (Janes, 1991; Meredith/Boli & Associates, Inc., 1992a and 1992b).

Groundwater sampled from wells completed in Eocene rocks is generally enriched with sodium and bicarbonate. Groundwater from Towsley Formation wells has mixed anionic and cationic species with no apparent chemical trend. Groundwater from San Gabriel Formation wells is enriched with calcium and magnesium, with no dominant anion. Specific hydrochemical parameters and their occurrence are discussed below.

Total Dissolved Solids: Relatively high concentrations of total dissolved solids (TDS) and bicarbonate were detected in groundwater from Eocene rocks (Table 6; Plate 8). During the course of groundwater sampling at the project property, TDS concentrations have ranged from approximately 223 to 4,360 mg/l in all wells completed in various formations. The greatest concentration of TDS was detected in a sample collected from monitoring well MW-21 (4,360 mg/l) during the second quarter water quality monitoring event (Table 6). This well is screened in the Towsley Formation and located near the Elsmere area (Newhall Oil Field), in the northern portion of the project property. Groundwater from well MW-21 was also the source of the highest detected concentrations of sulfate, calcium, magnesium, and potassium. The TDS concentration detected in MW-21 exceeded the United States Environmental Protection Agency (USEPA) drinking water secondary recommended standard of 500 mg/l for TDS by almost 8 times. In addition, TDS concentrations in samples collected from wells MW-1, MW-2, MW-13, MW-17, C-9, C-10, C-11, C-15, and spring SP-4 also exceeded this recommended standard (Table 6). Concentrations of total dissolved solids may be related to the formation in which wells are completed, and/or may be impacted from nearby oil field brines.

pH: Values of pH have ranged from 3.3 in spring SP-2 to 8.3 in well MW-13 (Meredith/Boli & Associates, Inc., 1992b). In addition to low pH found in spring SP-2, high sulfur content and odors were detected at this location where Towsley Formation exposures contain active tar seeps. Low pH in spring SP-2 is probably related to natural oxidation of reduced sulfur content in this location. This value was outside the range of 6.5 to 8.5, recommended as the secondary drinking water standard by the USEPA. In contrast, an elevated pH of 8.3 was detected in groundwater from the San Gabriel Formation. This slightly alkaline condition is probably due to natural weathering of igneous/metamorphic minerals in which hydronium ion (H_30^+ or H^+) is consumed and hydroxyl ion (OH^-) is produced.

Chloride and Sulfate: Relatively high concentrations of chloride and sulfate (Table 6; Plate 8) were detected in groundwater samples from Eocene and Towsley Formation wells west of the Whitney Canyon fault, and particularly, in the vicinity of the Elsmere area. These naturally elevated concentrations of chloride and sulfate are likely associated with oil-related brines. During the three groundwater sampling periods at the project property, concentrations of chloride and sulfate ranged from 4.0 to 306 mg/l, and non-detect to 2,690 mg/l, respectively. The highest sulfate concentration (2,690 mg/l) was detected in the groundwater sample collected from well MW-21 (Plate 8), likely influenced by naturally occurring oil-related brines (Meredith/Boli & Associates, Inc., 1992a and 1992b). Elsewhere on the project property, sulfate concentrations ranged from less than 1 mg/l to about 100 mg/l in the eastern areas underlain by San Gabriel Formation rocks. Sulfate concentrations were generally higher in areas west of the Whitney Canyon fault, ranging from about 50 mg/l to 375 mg/l.

Chemical Oxygen Demand and Total Organic Carbon: Elevated Chemical Oxygen Demand (COD) and high concentrations of Total Organic Carbon (TOC) were also detected in groundwater near, or west of the Whitney Canyon fault and near the Elsmere and Tunnel areas. High COD is normally directly correlated with high TOC and/or reduced compounds such as sulfides. Thus, as expected, the highest COD and TOC concentrations (19,000 mg/l and 720 mg/l, respectively) were reported from spring SP-1 in the Pico Formation, located in the northwestern portion of the project property (Janes, 1991). Spring SP-1 occurs in an area of actively flowing tar seeps and springs, where high TOC and sulfide concentrations are probably due to naturally occurring petroleum hydrocarbons, resulting in elevated COD. During the first and second quarterly groundwater quality monitoring events, the highest TOC and COD concentrations (360 mg/l and 230 mg/l, respectively, first quarter 1992) were detected at monitoring well C-10 located in the southwestern portion of the project property (Meredith/Boli & Associates, Inc., 1992a and 1992b). Well C-10 is screened in the lower Towsley Formation and has been impacted by naturally occurring crude oil.

Iron: Groundwater at the project property is characteristically low in iron, with the exception of relatively elevated concentrations of 51.7 and 2.90 mg/l detected in spring SP-2 during the background and first quarter water quality monitoring events, respectively (Janes, 1991; Meredith/Boli & Associates, Inc., 1992a). Presence of high natural TOC and sulfide compounds create a reducing condition, as indicated by high COD, resulting in increased dissolution of natural occurring iron in a ferrous (Fe^{++}) form. These iron concentrations exceed the USEPA drinking water standard secondary maximum contaminant level of 0.3 mg/l. Spring SP-2 is located west of the Whitney Canyon fault in the northwestern portion of the project property in an area of active tar seeps. Staining, resembling rust, was noted on nearby rock formations during sampling activities at this location. Such stains indicate natural oxidation of dissolved ferrous ion to ferric ion (Fe^{+++}), as ferrous ion-rich water flows away from the source (SP-2 spring), thus precipitating ferric iron oxides in nearby rocks.

9.4 LOCAL HYDROGEOLOGIC MODEL

Local geology and topographic relief are the primary controls in the occurrence and flow of groundwater at the project property. The combination of these two factors also influences recharge/discharge areas and conditions, hydraulic gradients, and hydraulic relationships among aquifers and aquitards at the property. The local hydrologic regime is also affected to some degree by naturally occurring petroleum and petroleum-related waters. Major components and characteristics of the conceptual local hydrogeologic model are discussed in the following sections.

9.4.1 Principal Water-Bearing Rocks

As discussed in Section 8.0, important fresh-water aquifers of the Eastern Hydrographic Subarea consist of thick, poorly consolidated Saugus Formation deposits, and overlying alluvium principally found within the Santa Clara River drainage and its major tributaries (Slade, 1986; 1988). However, these units essentially are either not present at the project property, in the case of the Saugus Formation, or are represented by shallow, areally limited deposits within stream drainages, in the case of alluvium. Thus, the principal water-bearing rocks within the project property are instead represented by fractured, crystalline San Gabriel Formation rocks and Eocene sedimentary deposits.

San Gabriel Formation: Groundwater occurs within secondary fracture porosity developed in the San Gabriel Formation, as the rock mass contains little or no primary porosity. The San Gabriel Formation is characterized by an interconnected fracture network of variable density. Drilling data and field mapping of fractures do not indicate a dominant orientation to fractures; however, lineaments observed in aerial photographs suggest that both northwest-southeast oriented and northeast-southwest oriented fractures may be present.

Both high-angle and low-angle fractures have been documented in outcrop and in subsurface cores. The available data suggest that most fractures appear to be open, although some fractures have been cemented by secondary mineralization, or partially infilled by tar and/or clay. Hydraulic conductivities and transmissivity calculated from in-situ packer testing are relatively consistent, and suggest that fractures are generally interconnected and capable of effectively transmitting groundwater. On a small scale within the fracture system, water level fluctuations observed in the monitoring wells (See section 9.2.3) have indicated that groundwater flow within the saturated portion of the San Gabriel Formation likely occurs under heterogeneous, anisotropic conditions, similar to that observed in other fractured rock aquifers (Freeze and Cherry, 1977; after Snow, 1968; 1969). On a larger scale that covers the area of the project property, groundwater flow within San Gabriel Formation rocks follows the steep topography at the property, under hydraulic gradients exerted by this relief (Plate 7B).

Eocene Rocks: Eocene sedimentary rocks, although indurated and moderately cemented, contain groundwater within both primary intergranular porosity and secondary fracture porosity. Fracture density within these rocks increases in the vicinity of local faults. Hydraulic conductivities and transmissivities are similar to those of the San Gabriel Formation. Based on available data including water level measurements, Eocene strata juxtaposed against San Gabriel Formation rocks along the Whitney Canyon fault exist under a single hydraulic regime. However, local influence on groundwater flow along the fault plane may be possible.

9.4.2 Aquitards

The Towsley Formation, comprised predominantly of siltstone, claystone and fine-grained sandstone, has extremely low hydraulic conductivities based on in-situ packer testing. The upper member, dominantly a siltstone and claystone, is interpreted to be an aquitard. Groundwater occurring in the Towsley is either present as localized saturated zones within sandstone lenses and layers in the upper member, or within coarse-grained deposits of the lower member, which typically contains naturally occurring petroleum hydrocarbons. Overall, the formation, which occurs stratigraphically above both the San Gabriel Formation and Eocene rocks, may act as a barrier to any significant upward flow into overlying units at the project property. This relationship is shown in geologic cross-sections on Plate 2 and diagrammatically depicted in Figure 13.

The local occurrence and accumulation of petroleum has also impacted the Towsley Formation and the local groundwater regime. Oil generated within the deeper portions of the basin has migrated vertically and horizontally within permeable sedimentary units and has either reached the surface in the Elsmere Canyon area or has accumulated in the subsurface within Pico deposits and lower Towsley beds. Because the coarse-grained lower member of the Towsley Formation is typically oil-bearing in the subsurface and tar-saturated in surface exposures, its ability to efficiently transmit groundwater has been further limited.

9.4.3 Local Groundwater Flow System and Hydraulic Relationships

Infiltration and recharge to the local aquifers is limited because of steep topographic gradients and thin soils developed over well-indurated bedrock with limited permeability. During moderate and heavy periods of precipitation, a substantial portion of the precipitation received within the Elsmere Canyon watershed leaves the property as surface flow. Precipitation contributing to local recharge includes infiltration at topographically higher areas that act as groundwater drainage divides. East Firebreak Road ridge is the primary drainage divide at the project property, with topographically lower drainage divides also coinciding with elevated areas flanking the main Elsmere Canyon drainage on the north, south and west. This configuration of drainage divides, in combination with relatively impermeable Towsley strata, produces an inward-directed, mainly northwest-sloping groundwater gradient that closely follows the Elsmere Canyon surface drainage pattern in the northwest area of the project property.

Within the local groundwater system, recharge and discharge within San Gabriel Formation rocks occurs through complex fracture pathways under flow rates controlled by fracture size, density and interconnectivity. Because of steep hydraulic gradients, the fracture network developed in these rocks, characterized by limited storage capacity, exhibits fairly responsive recharge and discharge to moderate and heavy precipitation.

Groundwater recharge to Eocene rocks occurs by direct infiltration of precipitation and by subsurface flow from the saturated portion of the San Gabriel Formation in hydraulic communication with these strata. Like the San Gabriel Formation, discharge from Eocene water-bearing strata occurs from springs and seeps in outcrops located within Elsmere Canyon, and flows into shallow alluvial deposits in the canyon drainage.

Fractured San Gabriel Formation igneous/metamorphic basement and Eocene sedimentary bedrock comprising the principal water bearing units at the project property are overlain by relatively impermeable strata of the Towsley Formation. Based on order of magnitude differences in hydraulic conductivities between Towsley deposits and San Gabriel Formation/Eocene rocks, there is likely very limited lateral flow of groundwater into Towsley strata. Because flow is confined beneath the Towsley aquitard, groundwater would be expected to mound up at the subsurface contact between San Gabriel Formation/Eocene rocks and overlying Towsley Formation. However, at Elsmere Canyon, stream drainages have eroded through confining Towsley beds, allowing discharge to occur from surface springs/seeps and subsurface fractures within canyon slopes where fractured bedrock is exposed. Discharging groundwater then flows into stream bed alluvium and continues as subsurface flow during low discharge periods or may contribute to surface flow during and after significant precipitation.

Further to the northwest in lower Elsmere Canyon, stream bed alluvium directly overlies and is in hydraulic communication with the coarse-grained Pico Formation. Some downward groundwater flow may occur from alluvial deposits into the underlying Pico, but likely would be limited because of the cemented and moderately indurated nature of Pico deposits.

At the southern portion of the project property, continuity of the Towsley Formation is not as well defined (Shields, 1977; Janes, 1991), and Pico Formation is in fault contact with San Gabriel Formation (Plate 1). In this area, groundwater has a southwest-directed component (Plate 7A), and may flow from water-bearing portions of the San Gabriel Formation into coarse-grained Pico deposits. However, the San Gabriel Formation/Pico Formation fault contact is located generally upgradient of the project property, including the southern part of the landfill footprint where groundwater flow is predominantly to the west and northwest. Also noteworthy is the presence of clayey siltstone and fine-grained sandstone belonging to the Sunshine Member of the Saugus Formation that occurs along the southern flank of the San Gabriel Mountains adjacent to San Fernando Valley. In the area south of the project property, the Sunshine Member is several hundred feet thick (CDMG, 1975) and could also impede groundwater flow and act as an aquitard much like the Towsley does to the northwest.

9.4.4 Relationship of Local Hydrogeology and Regional Aquifers

The majority of local groundwater flow in the Elsmere Canyon area occurs through fractures in San Gabriel Formation and in the alluvium in the lower reaches of the canyon. Groundwater mainly flows northwest through the San Gabriel Formation and discharges as springs and seeps into alluvium or at the ground surface in the lower portions of the canyon. The Whitney Canyon Fault (WCF), while possibly influencing rates of groundwater movement locally, allows overall groundwater flow and probably exerts limited control on flow direction. Flow within alluvium follows the canyon bottom and exits the property at the northwest canyon mouth west from wells MW-17 and MW-22 (Plate 7A).

The groundwater flow within the project property is part of the regional flow system within the Eastern Hydrographic Subarea of the Santa Clara Hydrologic Basin. Because the southern portion of the property straddles a major drainage divide, groundwater south-southeast of this divide flows south and southwest within the watershed of the Upper Los Angeles River area. Groundwater flow beneath the proposed landfill footprint is primarily toward the west and northwest within the Eastern Hydrographic Subarea.

Investigation of the Towsley Formation at the project property indicates that it is a fine-grained, laterally continuous deposit of very low hydraulic conductivity. Regional studies (Winterer and Durham 1962; Nelligan, 1978) show that the Towsley is of similar lithology and thickens dramatically to the west. As such, the Towsley Formation constitutes a local and probably regional aquitard to westward flow of groundwater from water-bearing portions of San Gabriel Formation and Eocene rocks into regional aquifers of the Saugus Formation and thick alluvium within the Santa Clara River Basin. This relationship is diagrammatically shown in Figure 13.

The landfill footprint will overlie San Gabriel Formation and Eocene rocks, and landfilled material will be buttressed against Eocene rocks and Towsley Formation within Elsmere Canyon North and South (Plate 1). The landfill will not be in direct hydraulic communication with regionally important aquifers within the Saugus Formation and thick alluvium in Santa Clara River valley further to the northwest. Moreover, the Towsley Formation overlies local water-bearing units and underlies regional aquifers to the west (Figure 13), restricting potential upward flow of locally-derived groundwater into regional aquifers. Given this condition, the pathway of local groundwater flow from the proposed landfill area appears to be limited to shallow subsurface flow in a northwest direction along the Elsmere Canyon drainage, as shown in Plate 7A. This local flow apparently occurs through shallow stream bed alluvium, and to a lesser extent, may also flow downward into Pico deposits. After exiting the project property, groundwater flow apparently continues in a downgradient direction toward thicker alluvial sediments in the South Fork of the Santa Clara River drainage and possibly downward into Saugus Formation in contact with alluvium northwest of the property.

At a limited portion of the southern area of the project property, local groundwater flow appears to follow a southwest-directed gradient flow (Plate 7A). Although the Towsley is present and would be expected to limit lateral groundwater flow somewhat, a limited portion of the local groundwater in this southern area appears to exit the property by subsurface flow between San Gabriel Formation rocks in fault contact with Pico beds (Plate 1). However, groundwater flow beneath the landfill footprint is directed toward the west and northwest away from the Sylmar and San Fernando areas.

10.0 GEOLOGIC HAZARDS

Existing or potential geologic hazards at any site can be classified as either seismic hazards or geotechnical (non-seismic) hazards. Seismic hazards are caused by the direct or indirect effects of earthquake activity, whereas geotechnical hazards are related to non-seismic causes, such as unfavorable soil or bedrock conditions, erosive soils and flooding potential. Seismic hazards are discussed below, followed by geotechnical hazards in Section 10.2.

10.1 SEISMIC HAZARDS

For discussion purposes, seismic hazards can be divided into primary seismic hazards and secondary seismic hazards. Primary hazards are a result of direct effects of an earthquake and include strong ground shaking and surface faulting. Strong ground shaking is a transitory phenomenon, whereas surface faulting results in permanent ground deformation. Secondary hazards generally result from the interaction of ground motion with existing soil and/or bedrock conditions. These potential hazards include ground lurching, liquefaction, seismic settlement/differential compaction, and seismically-induced slope instability/landsliding.

After the 1971 San Fernando earthquake, geologists with California Division of Mines and Geology conducted an intensive mapping effort in the San Fernando area to document the surface effects and damage resulting from the event. Data were compiled in text and maps presented in CDMG Bulletin No. 196 (Oakeshott, 1975) and document both primary and secondary seismic hazards and damage in the areas affected by the 1971 earthquake. Information presented in the report was used in evaluating potential seismic hazards at the project property.

10.1.1 Strong Ground Motion

The maximum credible earthquake (MCE)[1] and maximum probable earthquake (MPE)[2] as defined in CDMG Note #43 (1980), were estimated for the faults and fault zones considered to have the greatest potential to generate earthquakes that could cause significant strong ground motion at the project property (Table 7). MCE's were estimated using historical seismicity, empirical relationships between fault rupture length and magnitude based on data from historical earthquakes (Slemmons, 1982; Bonilla and others, 1984; Slemmons and others, 1989; and Wells and Coppersmith, 1992) and published geologic evidence of paleoseismic events. The fault rupture lengths used to estimate the MCEs are the longest segments, based on geologic and/or seismic data, which are considered likely to rupture in a single earthquake. The estimated MCE's are believed to be reasonably conservative and generally consistent with the magnitude estimates for these faults by Ziony (1985) and Wesnousky (1986). MPE's were estimated using fault dimensions, slip rates, and regional seismic parameters applied to the method of Molnar (1979), as well as professional judgement.

Estimated MCE's and MPE's are reported using moment magnitude (M_W) scale. For the purposes of this assessment, M_W is assumed to be equivalent to surface wave magnitude

[1] The CDMG (Note #43) definition of a maximum credible earthquake is the maximum earthquake that appears capable of occurring under the presently known tectonic framework. It is a rational and believable event that is in accord with all known geologic and seismologic facts. In determining the maximum credible earthquake, little regard is given to its probability of occurrence, except that its likelihood of occurring is great enough to be of concern.

[2] The CDMG (Note #43) definition of a maximum probable earthquake is the maximum earthquake that is likely to occur during a 100-year interval. It is to be regarded as a probable occurrence, not as an assured event that will occur at a specific time.

(M_S) between magnitude 5.5 to 8.0 and local magnitude (M_L) below magnitude 6.0 (Kanamori, 1983).

The peak ground acceleration (PGA) at the project property associated with the MCE and MPE for each source fault is estimated using the composite attenuation relationships of Joyner and Boore (1988) and Donovan and Becker (1986) as updated by Dames & Moore's Dr. Neville C. Donovan. This relationship is the arithmetic mean of five commonly used, published and unpublished attenuation relationships. The source distance (Table 7) used for the Donovan and Becker (1986) relationship is the closest distance between the mapped or inferred surface trace of the source fault and the project property, except in the case where a fault has a significant dip toward the property. In these cases (e.g., San Fernando-Sierra Madre fault zone), the projection of an 8 km hypocentral depth along the fault plane to the ground surface was used to estimate a source distance. For the Joyner and Boore (1988) relationship, the source distance was calculated as outlined in their methodology.

Based on estimated fault capability and proximity, a MCE on the San Fernando-Sierra Madre fault zone would most likely generate the strongest ground accelerations at the project property. As shown in Table 7, estimated mean PGA of 0.54 to 0.60g (gravity) may be associated with this event. A MCE on the San Gabriel fault or the Santa Susana fault zone is expected to result in slightly lower levels of shaking of about 0.50 to 0.51g and 0.45 to 0.46g, respectively. Based on the results of the analysis of MPE's, a postulated MPE of M_W 6 1/2 on the San Fernando-Sierra Madre fault zone would likely generate the highest PGA at the site of 0.41 to 0.52g. These estimated ground motion values are intended for environmental review purposes only. Design-basis estimates of PGA at the project property will need to be developed during engineering design.

The theoretical PGA at the project property calculated for a MPE on San Fernando-Sierra Madre fault zone (approximately 0.45g) is comparable to measured accelerations recorded at a number of stations in the project region during the 1971 M_W 6.6 San Fernando earthquake. Several accelerograph stations were located on the upper thrust plate, including stations Pacoima Dam, Lake Hughes (Station No. 12), and Castaic Dam, located approximately 5 miles, 12 miles, and 14 miles from the project property, respectively (Cloud and Hudson, in Oakeshott, 1975). About 15 to 18 miles from the epicenter, PGA's of 0.37g and 0.39g were recorded at Lake Hughes and Castaic Dam, respectively. The highest ever recorded peak accelerations were measured at the Pacoima Dam Station, located 5 miles from the epicenter. However, steep topography and dam structure resulted in resonant amplification at this site (Bolt, et al., 1975). In total, peak accelerations greater than 0.15g were measured on 31 records within about 26 miles of the fault zone during the 1971 earthquake (Bolt, et al., 1977).

10.1.2 Surface Fault Rupture

With minor exception, no Alquist-Priolo Special Studies Zones (APSSZ) are located at the project property (Hart, 1990), and no APSSZ occur within 3,000 feet of the landfill footprint. Unnamed segments of the Santa Susana fault zone in the San Fernando Pass area experienced ground rupture during the 1971 San Fernando earthquake and received Alquist-Priolo Special Studies Zone designation (CDMG, 1979, San Fernando and Oat Mountain Quadrangles) based on field observations by CDMG geologists immediately after the earthquake (Weber, in Oakeshott, 1975). A Fault Evaluation Report (FER) (CDMG, 1977b) was prepared to evaluate other portions of the Santa Susana fault zone immediately west of these zoned segments, but did not recommend additional zoning. The extreme southern tip of the property extends about 300 feet into one of the areas zoned after the 1971 earthquake with the remaining southern portion about one-quarter to one-half mile north of the segment. In addition, a short zoned segment extends into the extreme southwest corner of the property where two ground breaks were observed after the 1971 earthquake. Project-specific mapping was unable to locate the specific surface features that were used to designate the Alquist-Priolo zoning in this area (Janes, personal communication, 1992). The zoned areas are located a minimum of 3,000 feet outside of the proposed landfill footprint area.

North of the project property, an approximately 5-mile long section of the San Gabriel fault has received Alquist-Priolo designation in the Saugus area (CDMG, 1988, Newhall Quadrangle), based upon studies by Cotton and others (1985), Kahle (1986), and Triemann (1986). The closest approach of the zoned area to the project property is about 2 1/2 miles to the north.

After the 1971 San Fernando earthquake, no evidence of surface faulting was documented on local faults mapped by Janes (1991) at the project property (USGS, 1971; Oakeshott, 1975). None of the local faults, including the Whitney Canyon fault, Legion fault, Elsmere field faults, Beacon fault, and Grapevine fault, are known to be active, and based on geologic data developed during project-specific investigation and previous studies, these faults are considered to be Quaternary faults within the criteria adopted by the CDMG. Therefore, the potential for surface rupture on faults at the project property is considered remote. There is no evidence of active faults located within 200 feet of the proposed landfill footprint.

10.1.3 Secondary Seismic Hazards

Secondary seismic hazards, as discussed herein, include earthquake-induced effects such as ground lurching, liquefaction. and seismic settlement/differential compaction. In addition to these hazards, other forms of slope instability, including landslides, may be seismically induced. Slope instability and landsliding are discussed under geotechnical hazards presented in Section 10.2.

After the 1971 San Fernando earthquake, the project property was included in aerial photograph review performed by the CDMG, and surface effects such as rockfalls and possible seismically-induced landsliding, were mapped onsite (Oakeshott, 1975, Plate 3). In addition, direct observations that were made at nearby, and in some cases adjacent areas, can be used in assessing potential secondary seismic hazards at the project property.

Ground Lurching: Ground lurching involves earth motion at right angles to a cliff, or more commonly a stream bank or artificial embankment, during ground strong shaking. Such motions may cause material to yield in the unsupported direction, forming a series of parallel to subparallel cracks separating the ground into blocks, resulting in stair-stepping ground cracking or shattered ground. Very often, ground lurching may trigger landsliding and mass wasting, or may weaken hillsides such that slope instability problems occur in the future.

In decreasing order of susceptibility, slopes underlain by sedimentary strata of the Towsley Formation, Pico Formation, and to a lesser extent, Eocene rocks are most prone to effects of ground lurching at the project property. Moderate to steep slopes developed in sedimentary terrain would be most susceptible to strong ground shaking effects, particularly where a variety of unfavorable pre-existing soil and bedrock conditions have weakened these rocks. These factors include loose or relatively unconsolidated material, weakly cemented beds, moderate to deep soil profile development, and presence of fractures and joints. Locally saturated conditions after heavy precipitation may also render these units more prone to ground lurching effects.

Several of the above conditions occur in the Towsley Formation, particularly in weakly consolidated siltstone and fine-grained sandstone of the upper member. A majority of the mapped landslides and unstable slopes within the project boundary occur in the upper portion of the Towsley, although some slides also involve lower Towsley beds (see Section 5.2.5.2). The Pico Formation would generally be less prone to ground lurching effects, since it consists of coarse-grained deposits and is often moderately to strongly cemented. However, because of these same characteristics, the Pico forms steep ridges and slopes in the western part of the property, which may be susceptible to ground lurching, cracking and slope failure where beds may be moderately to highly fractured. This condition may have occurred along the steep, east-facing flank of Pico Ridge (Plate 1) where aerial photograph mapping performed by the CDMG after the 1971 San Fernando earthquake indicated an area of fresh landsliding/rockfalls in this vicinity (Oakeshott, 1975, Plate 3). Because of the limited exposures and dense, well-cemented nature of Eocene strata, these rocks would likely not be significantly affected by ground lurching. Potential effects would be limited to steep slopes within Elsmere Canyon where Eocene rocks may be highly fractured and seismically triggered rock falls may occur. Finally, the effects of ground lurching upon San Gabriel Formation crystalline rocks would likely be manifested as local rockfalls at steeply exposed fractured/jointed outcrops.

The effects of ground lurching at the project property during the 1971 San Fernando earthquake were generally limited to a few seismically triggered landslides and local rockfalls (Oakeshott, 1975, Plate 3). In addition, several of the tops of steep ridges underlain by Pico and Towsley rocks experienced ground cracking and shattering. Immediately to the west at the San Fernando Pass area in the vicinity of the Interstate 5 (I-5) and SR 14 interchange, ground lurching effects were more dramatic. In addition to structural damage to the freeway interchange, railroad line, and Los Angeles aqueduct caused by strong ground shaking, several graded cut-slopes along I-5 and SR 14 failed by seismically-induced ground lurching. Failures mainly occurred in Towsley Formation, where lateral support had been removed exposing weakly consolidated, fractured and water-saturated siltstone and fine-grained sandstone (Evans in Oakeshott, 1975).

Liquefaction: Liquefaction is a phenomenon whereby soils lose their supportive capacity and behave as a liquid during repeated cycles of strong shaking. Prerequisite conditions for liquefaction are shallow groundwater (typically less than 50 feet) and saturated, loose, cohesionless granular soils. Liquefaction occurs when the pore-water pressure in the soil approaches its confining pressure due to seismic loading. Tinsley and others (1985) indicate sand and silty sand deposits have the greatest susceptibility to liquefaction, while dense deposits, gravelly and cobbly deposits, and deposits with more than 15 percent clay are less susceptible. Based on data from project-specific investigation (Janes 1991; EMCON 1992), including depth to groundwater and characteristics of geologic units, only alluvial deposits would likely be potentially susceptible to liquefaction effects.

Seismic Settlement/Differential Compaction: Seismic settlement is the compaction or consolidation of soils as a result of seismically induced ground shaking. Loose, sandy and/or silty soils are typically most susceptible to seismic settlement. Differential compaction may occur with variation in soil depth, soil density, and severity of ground shaking across a site. Seismically-induced settlement can occur in both dry and partially saturated material.

The potential for seismic settlement and differential compaction within bedrock materials at the project property is considered to be negligible to very low because of the typically consolidated nature of sedimentary units. Loose and poorly consolidated landslide deposits and recent alluvium would be more susceptible to these effects.

10.2 GEOTECHNICAL HAZARDS

Existing or potential geotechnical hazards at the project property include moderately expansive soils, slope erosion, and slope instability. These are discussed below.

10.2.1 Expansive Soils

The shrink-swell potential of a soil refers to the anticipated volume change resulting from changes in the soil's moisture content. The primary cause of expansion or shrinkage is volumetric change due to wetting and drying of clay minerals. The type and amount of clay in the soil controls the amount of soil expansion. The layered sheet structure of certain types of clay minerals gives them the capacity to absorb water molecules between these sheets, thus causing expansion of the structure. When the mineral begins to dry, the water evaporates, and the structure collapses. Clay minerals particularly susceptible to this type of expansion and shrinkage include montmorillonite, beidellite, nontronite, hectorite and saponite (Dana, 1977).

In general, soils at the property have low to moderate shrink-swell potential (Table 3). Soils with low shrink-swell potential include: Gaviota, Hanford, Ojai, and Saugus soil series. Soils with moderate shrink-swell potential include Castaic, Millsholm, and Yolo. These latter soils are primarily located in the extreme western, west-central, and southwestern portions of the property (Figure 11).

10.2.2 Erosion

As discussed in Sections 5.5.1 and 5.5.2, the potential for erosion varies across the project property. The majority of the property is underlain by soils with moderate to very high erosion hazard ratings and moderate to high sheet and rill erosion potential. Factors contributing to the rate of erosion include: soil type, slope length and steepness, vegetation cover, root development, and climatic factors such as precipitation. Slope length and steepness are critical factors that control the velocity of runoff and therefore contribute directly to the potential for sheet and rill erosion.

Areas within the project property identified as being highly sensitive to erosion due to disturbance include the eastern portion of the property, the northwestern portion of the property, and a small area near the west-central portion of the property (Figure 11). Two soil types in the eastern portion of the property underlie the majority of the proposed landfill footprint area. These include Caperton-Trigo, granitic substratum-Lodo families complex and Trigo-Modesto-San Andreas families complex, both which have very high erosion hazard ratings. Fairly extensive erosion was observed on aerial photographs in the southeastern portion of the project property underlain by Caperton-Trigo, granitic substratum-Lodo families complex. Castaic and Saugus mixture soils located in the west-central portion of the property also have a very high erosion hazard rating and very high sheet and rill erosion potential. Ojai soils located in the northwestern portion of the property are also very susceptible to sheet and rill erosion (Figure 11).

10.2.3 Slope Stability

Landslides: Six small landslides and one large landslide were mapped within the landfill footprint. Other landslides of varying sizes were mapped within the project boundary, but outside of proposed impact zones (Janes, 1991). The landslides are predominantly located in the southwestern and western areas of the project within sedimentary rock units of the Towsley and Pico Formations and Eocene rocks. One landslide was identified within the igneous and metamorphic basement rocks of the San Gabriel Formation. Many of the larger landslides identified on the property are located on large dip slopes and appear to have occurred as failures along bedding planes that dip out-of-slope at less than the slope angle (EMCON, 1992).

The primary contributing factors to the landslides at the project property appear to be the removal of lateral support, surcharge, earthquakes, and composition (Janes, 1991). As shown on Plate 1, the majority of the landslides at the project property occur in the vicinity of mapped faults. Numerous slides were mapped along the slopes adjacent to Whitney Canyon fault and Elsmere field faults A and B (Plate 1). The topographic expression of the fault traces at the project property are generally steep, northwest-southeast to north-south oriented incised drainages, which do not provide lateral support to west and southwest dipping beds. As drainages are incised, lateral support is removed, and slope failure occurs in the weak sediments. This geometric relationship is most pronounced in the southern portion of the project property. The siltstone members of the Upper Towsley Formation and Pico Formation are the most susceptible to failure. Pervasive fracturing permits percolation of precipitation which promotes deep weathering and shrink and swell of clay minerals; this effect results in a decrease of shear strength, and promotes slope failure (Saul and Wootton, 1983). Exploratory test pits in landslide material indicated slide deposits are predominantly siltstone with some sand and silty sand. The siltstone material was generally described as soft, weathered, and dry to moist, with no indication of sliding. The coarser-grained material was generally described as medium dense, moist to very moist, and highly weathered (EMCON, 1992a).

The uppermost siltstone member of the Towsley Formation appears to be the most susceptible to slope instability due to unfavorable bedding structure and relatively weak bedrock strength (EMCON, 1992b), and existing landslides tend to be larger in aerial extent. Landslides involving Pico Formation are typically smaller and are located along steep slopes such as Pico Ridge. However, one very large complex landslide is present below Cliff Face Ridge that apparently involves both Towsley and Pico rocks (Plate 1). Eocene rocks appear to be relatively stable, and slides mapped in the vicinity of Eocene exposures appear to have originated within Towsley beds near the contact with the underlying Eocene. One landslide was identified in the basement rocks of the San Gabriel Formation. The San Gabriel Formation, composed of crystalline granitic and gneissic rock, may be less prone to large-scale landsliding due to a lack of well-defined continuous planes of weakness, such as bedding (Janes, 1991; EMCON, 1992b), and a high internal angle of friction due to interlocking grain structure.

Cut-Slopes: There are few existing cut-slopes at the project property, other than small embankments along service roads in the western part. No obvious significant slope-stability problems have been noted at these locations to date, based on geologic mapping of the property (Janes, 1991).

The greatest potential for slope instability would be expected in large cut-slopes in sedimentary formations, particularly the upper siltstone member of the Towsley Formation. The potential for bedding-plane or translational failure exists where bedding dips out of the slope at an angle less than the natural or graded slopes. Westerly facing cuts in the sedimentary rocks could expose adverse geologic structures susceptible to landsliding, based on geologic information for this area including bedding attitudes (Plate 1). In addition, cut-slopes could expose existing landslides not previously recognized at the property.

Potential slope instability in the San Gabriel Formation may occur locally in areas of highly fractured or jointed rocks, where intersecting joint and/or fracture planes may be adversely oriented with respect to natural and graded slopes (EMCON, 1992b). In addition, cut-slopes excavated in areas of highly weathered or altered rock could result in slope instability. However, in general, the San Gabriel Formation is considered to be the most stable rock unit at the project property, in terms of susceptibility to slope destablization during excavation.

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TABLE 1

TAXONOMIC SOIL CLASSIFICATION FOR SOIL UNITS RECOGNIZED ON USFS LAND

Soil Families Mapped At The Site	Order	Suborder	Great Group	Subgroup	Family
Caperton Family	Mollisols	Xerolls	Haploxerolls	Entic Haploxerolls	Loamy, mixed thermic, shallow Entic Haploxerolls
Trigo Family	Entisol	Orthent	Xerorthent	Typic Xerorthents	Loamy, mixed, nonacid, thermic, shallow Typic Xerorthents
Lodo Family	Mollisols	Xerolls	Haploxerolls	Lithic Haploxerolls	Loamy, mixed, thermic, Lithic Haploxerolls
Modesto Family	Alfisols	Xeralf	Haploxeralfs	Mollic Haploxeralfs	Fine-loamy, mixed, thermic Mollic Haploxeralfs
San Andreas Family	Mollisols	Xerolls	Haploxerolls	Typic Haploxerolls	Coarse-loamy, mixed thermic Typic Haploxerolls

Source: Soil Survey of Angeles National Forest Area, USDA (1991)

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TABLE 2

SUMMARY OF SELECTED PROPERTIES OF SOILS AT THE PROJECT PROPERTY

Soil Complex/Series[1]	USCS	Hydrologic Soil Group[2]	Permeability Inches Per Hour[3]	Max Ehr[4]	Erosion Factor K[5]	Drainage Class[6]	Soil Manageability Group/Class[7]	Allowable Soil Pressure[8]	Road Location[9]	AASHO Classification[10]
Caperton-Trigo, granitic substratum - Lodo soil family[A]	SM	C	0.6 - 6.0	Very High	0.2	Well drained	IV 4 Ed	N.I	N.I.	N.I.
Trigo-Modesto - San Andreas families complex[A]	SM	C	0.2 - 0.0	Very High	0.32	Well drained	III 3E	N.I	N.I.	N.I.
Gaviota rocky sandy loam[B]	ML-SM	D	2.0 - 6.3	High	Moderate	Well to excessively drained	N.I.	Moderate	Steep slopes; hard ss at depth of 14" to 20"	A-2
Millsholm rocky loam[B]	ML-CL	D	0.63 - 2.0	High	Moderate	Well drained	III 3 Ed	Moderate	Steep slopes in places, hard ss & sh at depths of 20" to 40"	A-4
Saugus loam[B]	SM-ML	B	0.63 - 2.0	High	Moderate	Well drained	N.I.	Moderate	Most features favorable	A-2-4 (0)
Castaic and Saugus soils[B]	ML-CL	C	0.2 - 0.63	Very High	Very High	Well drained	N.I.	Moderate	Steep slopes; weathered sh at a depth of 20" to 30"	A-7
Ojai loam[B]	SM-SC	C	0.63 - 2.0	Moderate - High	Moderate to High	Well drained	N.I.	Moderate	Steep slopes in some places	A-4 (1)
Yolo loam[B]	ML	B	0.63 - 2.0	None - Medium	Low	Well drained	N.I.	Moderate	Most features favorable	A-6 (8)

KEY:
See attached description
USCS - Unified Soil Classification System
N.I. - No information
EHR - Erosion Hazard Rating
ss - Sandstone
sh - Shale
AASHO - American Association of State Highway Officials

KEY TO TABLE

1. **Soil Type**
   (A) Soils mapped within National Forest boundaries. Source: Forest and Soil Conservation Service, Soil Survey of Angeles National Forest Area, California (USDA, 1991)
   (B) Soils mapped on private land. Source: Soil Conservation Service, Soil Survey of Antelope Valley Area, California, (USDA, 1969 and 1970)

2. **Description of Hydrologic Soil Groups Mapped within Site Boundaries**
   B - Moderately low to moderate runoff potential. Soils have moderate infiltration rates when thoroughly wet. They are mostly moderately deep, moderately well drained to excessively drained, moderately fine to moderately coarse textured and have moderately slow to moderately rapid permeability.
   C - Moderately high to high runoff potential. Soils have slow infiltration and water transmission when wet. Mostly belong to one of two general categories. First category are mostly well drained and moderately well drained soils that have a low permeability layer at moderate depth (20 to 40 inches). Second category soils generally have moderately fine or fine textures or a moderately high water table and may be somewhat poorly drained. This group also includes shallow soils over hard but highly fractured bedrock that allows moderate water transmission.
   D - High to very high runoff potentials. Soils have very slow rates of infiltration and water transmission when wet. Mostly fine textured soils that have shrink - swell potential, soils that have a high water table, soils that have a low permeability layer near the surface, or shallow soils over an impervious layer.

3. **Permeability Rating: Descriptions**

inches per hour	description
<0.06	very slow
0.06 - 0.20	slow
0.2 - 0.60	moderately slow
0.6 - 2.0	moderate
2.0 - 6.0	moderately rapid
6.0 - 20.0	rapid

4. **Maximum Erosion Hazard Ratings (EHR)**

   Low EHR - Accelerated erosion is unlikely, except during periods of above average precipitation, and in soils bordering on moderate EHR. Erosion control measures are usually not needed.

   Moderate EHR - Accelerated erosion is likely to occur. Need for erosion control should be evaluated.

   High EHR - Accelerated erosion will occur in most years, especially during periods of above average storm occurrence. Erosion control is necessary.

   Very High EHR - Accelerated erosion will occur in most years, even during periods of below average storm occurrence. Erosion control is essential.

5. **Erosion Factor K** - A numerical value for erosion factor K was provided for soils included in the USDA's Soil Survey of Angeles National Forest Area, California (USDA, 1991). A descriptive value was provided in USDA's Soil Survey Antelope Valley Area, California (USDA, 1970). The erosion factor provides an indication of the soils susceptibility to sheet and rill erosion. The higher the numerical value, the more susceptible the soil is to this type of erosion.

6. **Drainage Class - Descriptions**

   Excessively drained - water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

   Somewhat excessively drained - water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

   Well drained - water is removed from the soil readily but not rapidly. It is available to plants throughout most of the growing season. Well drained soils are commonly medium textured. They are mainly free of mottling.

7. **Soil Manageability Group/Class.** This classification was only available for soils included in the soil survey of Angeles National Forest Area, California (USDA, 1991). Millsholm rocky loam was not mapped on National Forest land within the site boundaries; however, a soil manageability description was provided in the 1991 report. Descriptions for soils identified on the site include:

IV, 4Ed - Group IV - Map unit is at least 40 percent Class 4

Class 4 - very difficult to manage. Soils in this class are on very steep slopes (>60%), or have two or more other major management limitations.

major modifier	E	-	high to very high EHR
moderate modifier	d	-	soil depth 10 to 20 inches

III, 3E Group III - map unit is predominantly Class 3. Less than 40% of the unit is Class 4.

Class 3 - moderately difficult to manage - Soils in this class are on steep slopes that are mostly 30-60%, or have a major management limitation, or both.

major modifier	E	-	high to very high EHR

8. **Allowable Soil Pressure** - the limitations are based on the texture of the soil and its consistence when dry, these descriptions were only provided for soils included in the SCS's 1970 soil survey covering the private land within the site.

slight	-	hard non-expansive soils
severe	-	loose sands
moderate	-	other types of soils

9. **Road location** - this provides features that adversely affect the location of roads. These descriptors were only available for soils included in SCS's 1970 soil survey covering the private land within the site.

10. **AASHO** - This descriptor classifies soil in seven principal groups. The groups range from A-1 (gravely soils having high bearing capacity, (the best soil for subgrade) to A-7 (clayey soils having low strength when wet, the poorest soil for subgrade). Relative engineering values are provided for some of the soils, indicated by a group index number. Group index numbers range from 0 to 20, best to worst, respectively.

TABLE 3

SUMMARY OF EXPANSIVE SOIL INFORMATION[1]

Soil Type	Shrink-Swell Potential	Potential Volume Change (Percent)	Coefficient of Linear Extensibility
Castaic	Moderate	4.0 to 7.0	0.055 to 0.076
Gaviota	Low	-	-
Hanford	Low	-	-
Millsholm	Moderate	-	-
Ojai	Low	0.1 to 2.8	0.01 to .041
Saugus	Low	0.1 to 1.5	0.018 to 0.022
Yolo	Moderate	7.4 to 9.1	0.029 to 0.035

(1) Data from Soil Conservation Service Soil Survey, of Antelope Valley Area, CA (USDA, 1970)

TABLE 4

GROUNDWATER MONITORING WELLS

Boring/ Well No.	Installation Date	Drilling Method	Drilling Depth (ft)	Well Depth (ft)	Total Screen (ft)	Screened Interval (ft)	Sand Pack (ft)	Formation
C-1B	N/A	Air Rotary	179.2	172.1	10	162.2 - 172.1	156 - 179.2	Bc
C-7A	5/10/91	Rotary Wash	280.0	273.0	5	268 - 272.8	266 - 276	Bc
C-8	3/19/91	Air Rotary	226.0	220.7	20	200.7 - 220.3	196 - 221	Eo
C-9	3/23/91	Air Rotary	82.5	77.7	10	67.9 - 76.9	63 - 77.5	Tt
C-10	4/04/91	Air Rotary	280.0	208.0	20	184.2 - 208	184 - 208	Tt
C-11	4/30/91	Air Rotary	263.8	208.5	20	188 - 208	178 - 212	Tt
C-12	4/22/91	Air Rotary	616.5	483.2	30	453.2 - 482.7	443.3 - 488	Tt
C-13	5/05/91	Air Hammer	101.5	96.0	10	85.5 - 95.5	80.3 - 96	Eo
C-14	4/15/91	Air Rotary	11.0	10.3	5	5 - 10	4.0 - 11	Qal
C-15	4/30/91	Air Rotary	267.0	256.0	10	246 - 256	240.2 - 256	Tt
C-16	5/08/91	Air Rotary	166.0	150.3	10	140 - 150	125.8 - 159.6	Eo
C-17A	6/24/92	Air Hammer/Air Rotary	501.0	500.3	20	480 - 500	472 - 501	Bc
C-18A	6/19/92	Air Rotary	150.0	112.0	20	92 - 112	89.8 - 112	Bc
MW-1	6/05/90	Air Hammer	44.3	35.0	20	15 - 35	14.5 - 37	Eo
MW-2	6/14-15/90	Air Hammer	120.0	90.0	40	50 - 90	45 - 95	Eo
MW-3	9/05/90	Air Hammer	34.8	30.9	20	10.5 - 30.5	9.5 - 32	Bc
MW-4	9/04/90	Air Hammer	68.3	65.5	40	25 - 65.5	18 - 68.5	Bc

TABLE 4 (Continued)

Boring/ Well No.	Installation Date	Drilling Method	Drilling Depth (ft)	Well Depth (ft)	Total Screen (ft)	Screened Interval (ft)	Sand Pack (ft)	Formation
MW-5	10/20/90	Air Hammer	38.0	37.0	20	17 - 37	15 - 38	Bc
MW-6A	10/18/90	Air Hammer	250.0	245.0	20	224.5 - 244.6	220 - 245.5	Bc
MW-6B	10/19/90	Air Hammer	24.0	23.0	10	12.6 - 22.7	10.9 - 23.3	Tt
MW-7	1/10/91	Air Hammer	200.0	194.4	20	173.9 - 193.9	159 - 194.4	Bc
MW-8	1/11/91	Air Hammer	179.5	173.4	20	154.1 - 174.1	148 - 174.3	Bc
MW-9	1/12/91	Air Hammer	205.0	200.3	20	180 - 200	173.7 - 203.8	Bc
MW-10	1/30/91	Air Hammer	245.0	237.0	20	217 - 237	208 - 245	Bc
MW-11	2/26/91	Air Hammer	345.0	345.0	20	225 - 245	220 - 250	Bc
MW-12	3/12/91	Air Hammer	350.0	350.0	20	329.7 - 349.7	224.5 - 350	Bc
MW-13	3/06/91	Air Hammer	300.0	300.0	20	279.7 - 299.7	271 - 300	Bc
MW-14	4/07/91	Air Hammer	160.0	155.4	20	135 - 155	129.5 - 160	Tt
MW-15	5/01/91	Air Rotary	200.0	195.5	20	175 - 195	170.4 -197	Tt
MW-16	5/02/91	Air Rotary	339.5	339.5	30	309.4 - 339.5	305 - 339	Tt
MW-17	5/03/91	Hollow-Stem Auger	20.0	20.0	10	10.2 - 19.5	6.4 - 20	Qal
MW-18	5/05/91	Air Rotary	79.0	74.0	10	64.3 - 73.7	61 - 74	Bc
MW-19	5/08/91	Air Rotary	212.0	190.3	20	170 - 190	168 - 192.5	Tt
MW-20	5/11/91	Air Rotary	270.0	235.0	20	210 - 230	208 - 235	Eo
MW-21	5/10/91	Air Rotary	395.0	379.5	10	369.3 - 379.1	364.7 - 380	Tt

TABLE 4 (concluded)

Boring/ Well No.	Installation Date	Drilling Method	Drilling Depth (ft)	Well Depth (ft)	Total Screen (ft)	Screened Interval (ft)	Sand Pack (ft)	Formation
MW-22	5/11/91	Hollow-Stem Auger	20.5	19.0	10	8.9 - 19.0	7 - 20.5	Qal
MW-23B	7/30/92	Air Hammer/Air Rotary	354.0	354.0	50	300 - 350	293 - 354	Bc
MW-24	8/04/92	Air Rotary	394.0	394.0	30	362 - 392	353 - 394	Bc
MW-25	7/21/92	Air Rotary	311.0	308.0	30	277.7 - 307.7	274.8 - 308	Bc

Qal - Alluvium
Tt - Towsley
Eo - Eocene
Bc - Basement Complex

TABLE 5

GROUNDWATER MONITORING WELL PAIRS

Formation	Deep Well	Screen Interval (ft bgs)	Water Level (ft msl)	Formation	Shallow Well	Screen Interval (ft bgs)	Water Level (ft msl)	Vertical Gradient
San Gabriel	C-1B	162 - 172	flowing (2405.6)	San Gabriel	MW-3	10.5 - 30.5	2402.63	Upward
San Gabriel	C-2	111.5 - 131.5	2173.94	San Gabriel	MW-4	25 - 65	2173.92	Upward[1]
San Gabriel	C-3	90 - 130	flowing (2234.5)	San Gabriel	MW-5	17 - 37	flowing (2235)	Upward
San Gabriel	MW-6A	224.5 - 244.5	2124.45	Towsley	MW-6B	12.5 - 22.5	2195.81	See Note[2]
San Gabriel	C-7A	268 - 273	2724.66	San Gabriel	MW-10	217 - 237	2729.02	Downward
San Gabriel	MW-13	280 - 300	2675.13	San Gabriel	MW-9	180 - 200	2733.02	Downward
Eocene	MW-2	50 - 90	1530.07	Eocene	MW-1	15 - 35	1526.37	Upward
Eocene	C-13	85.5 - 95.5	1552.41	Alluvium	C-14	5 - 10	1550.83	Upward
Towsley	C-11	188 - 208	1548.07 (oil impacted)	Towsley	MW-14	135 - 155	1556.20	See Note[3]
Towsley	C-15	246 - 256	1827.91	Towsley	MW-15	175 - 195	1825.97	Upward
Towsley	C-10	184 - 204	1966.05 (oil impacted)	Towsley	C-9	68 - 78	2031.10	See Note[3]
Towsley	C-12	453 - 483	well damaged	Towsley	MW-16	309.5 - 339.5	1694.38	See Note[4]
Alluvium	MW-17	10 - 20	dry	Alluvium	MW-22	9 - 19	1410.91	---

September 1992 Water Levels
ft bgs - feet below ground surface
ft msl - feet above sea level
Ground surface elevation for flowing wells

Notes:
(1) Previous monitoring data for 4/92 through 8/92 also support upward gradient.
(2) Shallow well MW-6B is likely monitoring perched water at the Towsley/San Gabriel contact.
(3) Water levels in Wells C-10 and C-11 have been affected by floating crude oil. Presence of oil in the deep well indicates upward flow of oil within the Towsley/Eocene intervals at these locations.
(4) Well C-12 was damaged until 9/92 and no historic water level data is available.

TABLE 6

GROUNDWATER ANALYTICAL RESULTS
SECOND QUARTER 1992
(5/27/92 - 6/4/92)[1]

Well	MW 1	MW2	MW 10	MW 13	MW 17	MW 18	MW 21	C-3	C-9	C-10	C-11	C-15	Spring SP-4
Formation	Eo	Eo	Bc	Bc	Qal	Bc	Tt	Bc	Tt	Tt	Eo	Tt	Tt
Analyte													
pH	7.2	7.3	7.3	7.9	7.1	7.5	7.3	7.6	7.0	7.6	7.6	7.1	7.9
TDS	910	912	372	600	882	286	4360	468	899	2330	1040	672	1040
Bicarbonate	2380	294	138	439	296	163	164	366	262	2010	580	573	792
Chloride	35.5	38.0	6.5	29.0	39.0	4.0	69.5	12.0	7.5	19.5	64.5	12.5	51.0
Sulfate	370	336	104	4.05	262	39.8	2690	4.05	376	50.7	213	ND[2]	ND
TOC	5.2	8.6	ND	3.4	8.8	1.2	2.9	1.7	4.6	66	13	7.3	32
COD	17.7	21.1	ND	ND	19	ND	ND	22.4	ND	974	197	20.4	31.8
Calcium	124	99.2	33.9	8.97	129	41.6	480	45.9	161	24.2	30.8	46.7	42.2
Iron	0.03	0.31	ND	0.18	0.22	0.36	0.05	0.03	0.12	0.04	0.19	0.24	0.16
Magnesium	51.7	44.3	24.3	14.6	44.2	15.0	290	26.4	51.3	26.0	34.7	71.0	27.2
Potassium	3.11	3.38	3.65	3.36	2.94	3.27	15.3	1.17	6.64	8.93	6.99	2.55	4.90
Sodium	71.5	123	27.9	179	45.1	17.3	159	77.8	37.4	829	278	83.9	288
TPRH	2	3	ND	ND	ND	ND	2	ND	ND	3000	3000	2	ND

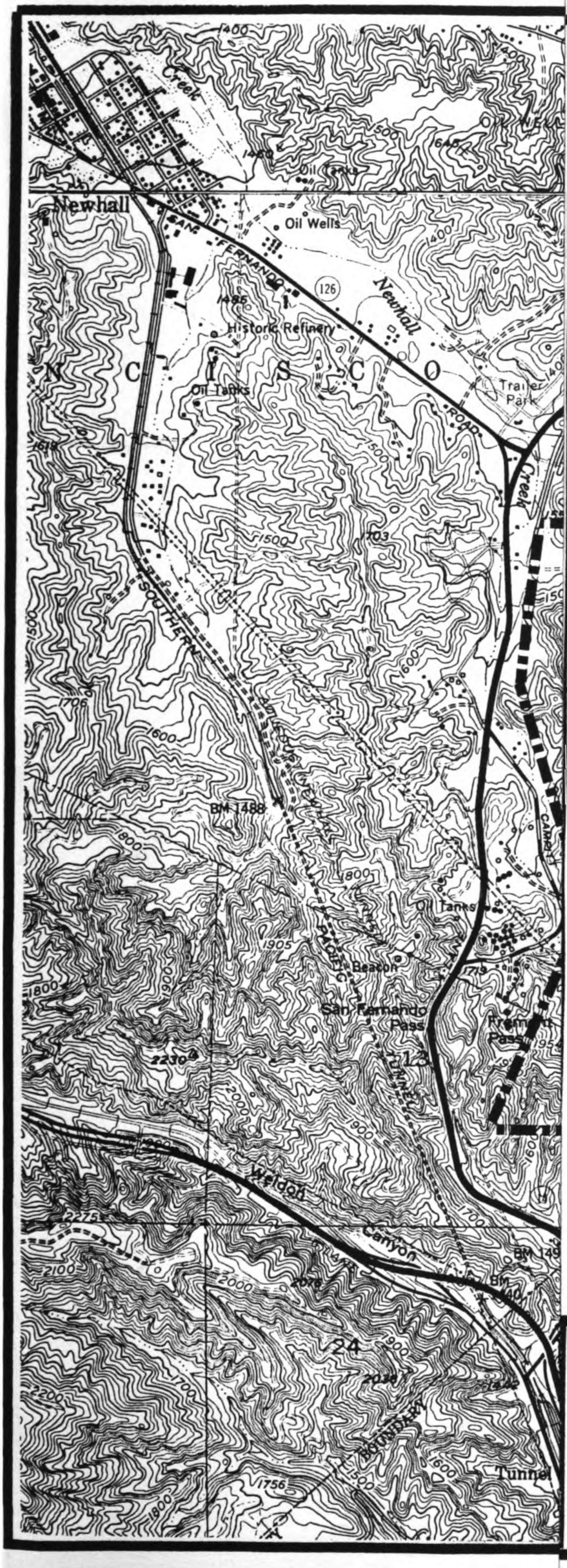
Notes: [1] Unit for all values in milligrams per liter (mg/l) except pH.
[2] ND - Non-detect at laboratory detection limits.
Bc - Basement Complex (San Gabriel Formation)
Eo - Eocene rocks
Tt - Towsley Formation
Qal - Quaternary alluvium
TOC - Total Organic Carbon
COD - Chemical Oxygen Demand
TRPH - Total Recoverable Petroleum Hydrocarbons

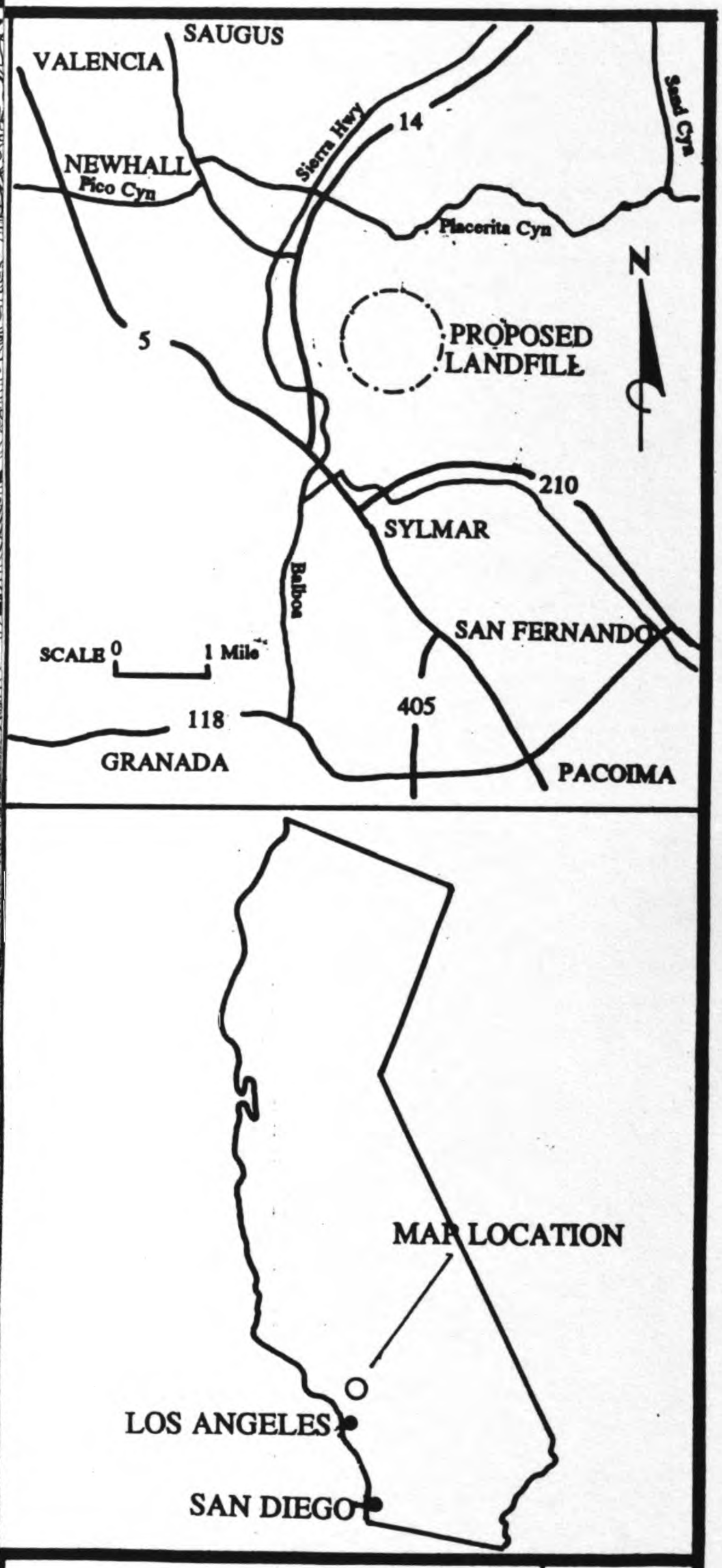
TABLE 7

ESTIMATED EARTHQUAKE MAGNITUDES AND ASSOCIATED PEAK GROUND ACCELERATIONS[1]

Seismic Source	MCE		MPE		MCE Rupture Length (km)	Distance (km)[3]
	Mag. (M_w)	PGA[2]	Mag. (M_w)	PGA		
San Andreas	8	.18 - .20g	8	.18 - .20g	300+	34
Garlock	7½	.06 - .09g	7	.05 - .06g	103	64
San Gabriel	7	.50 - .51g	6	.30 - .35g	38	3.2
San Fernando-Sierra Madre	7	.54 - .60g	6½	.41 - .52g	28	1[4]
Santa Susana	7	.45 - .46g	6½	.35 - .38g	28	5[5]
Verdugo-Eagle Rock	6½	.24 - .26g	6	.18 - .19g	20	11
Northridge Hills	6½	.22 - .24g	5	.10 - .10g	15	12
Santa Monica	7	.12 - .14g	6	.07 - .07g	27	31
Newport-Inglewood	7	.09 - .11g	6½	.07 - .08g	30	39
Oak Ridge	7¼	.19 - .21g	6	.10g - .10g	50	22.5
San Cayetano	7	.14 - .16g	6	.08 - .08g	42	27

Notes:
(1) Peak ground acceleration (PGA) values shown in this table are intended for environmental review purposes only and not for design.
(2) PGA values are based on attenuation relationships by Donovan and Becker (1986, as modified by Donovan) and Joyner and Boore (1988).
(3) Distance from the project property to the closest location on the surface trace of the fault except where noted.
(4) Distance to the vertical projection of the fault surface assuming the center of energy release occurs at a depth of 8 km.
(5) Distance to the projected subsurface trace of the Santa Susana fault zone assuming a fault dip of 50°N.





ELSMERE CANYON
SITE LOCATION MAP

FIGURE
1

9/29/92

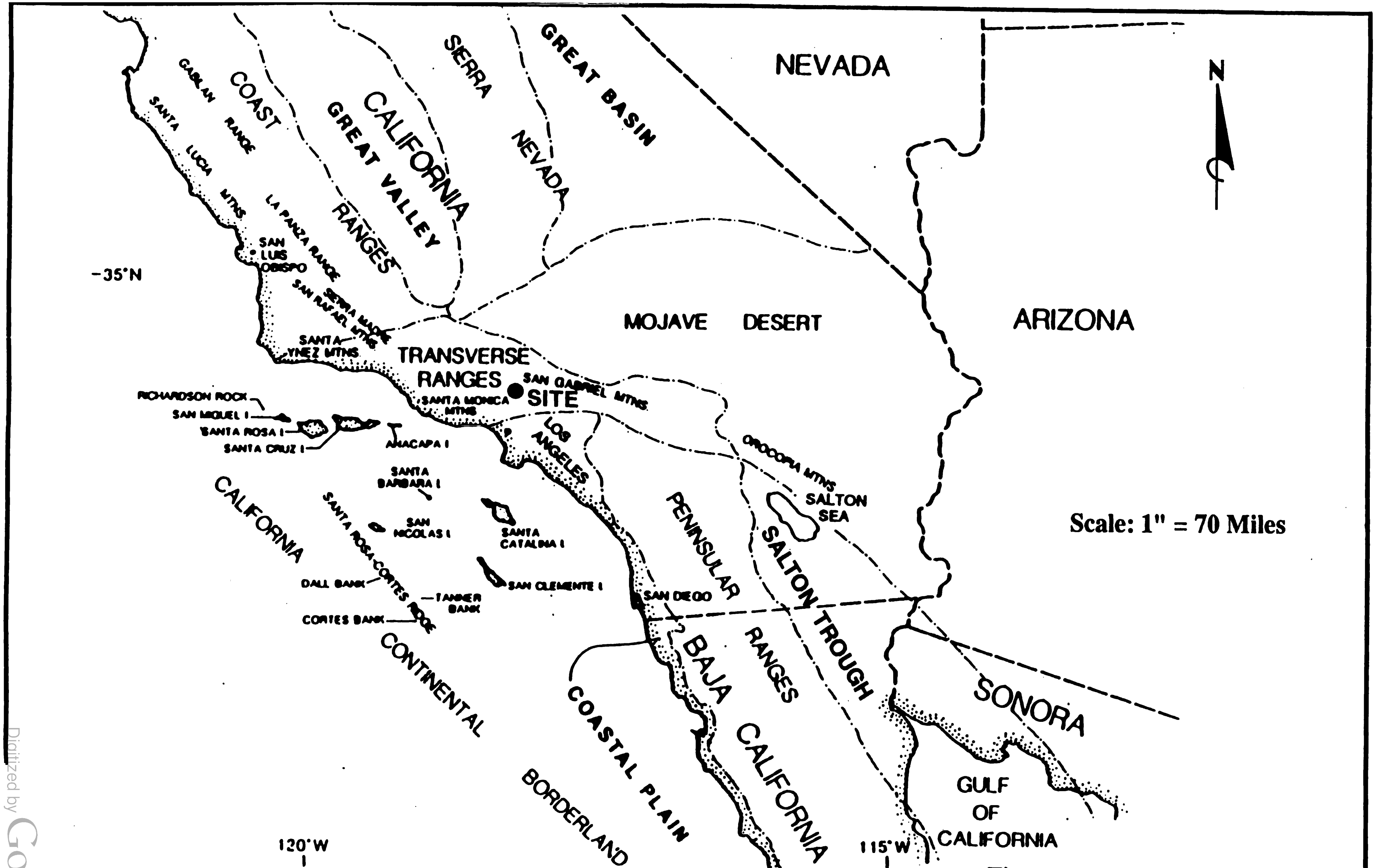


Figure 2

GEOLOGIC PROVINCES
SOUTHERN CALIFORNIA - NORTHERN BAJA CALIFORNIA

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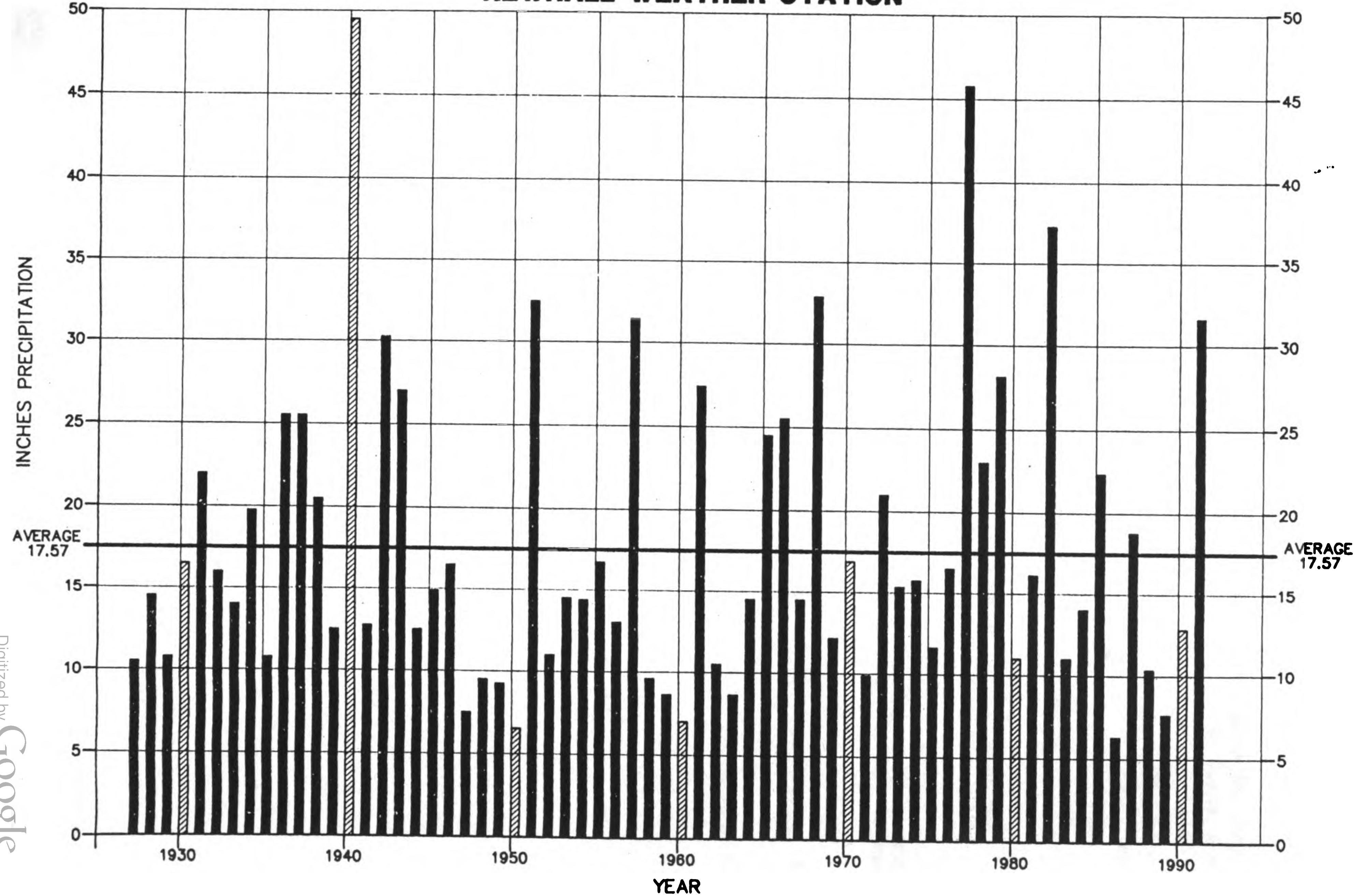
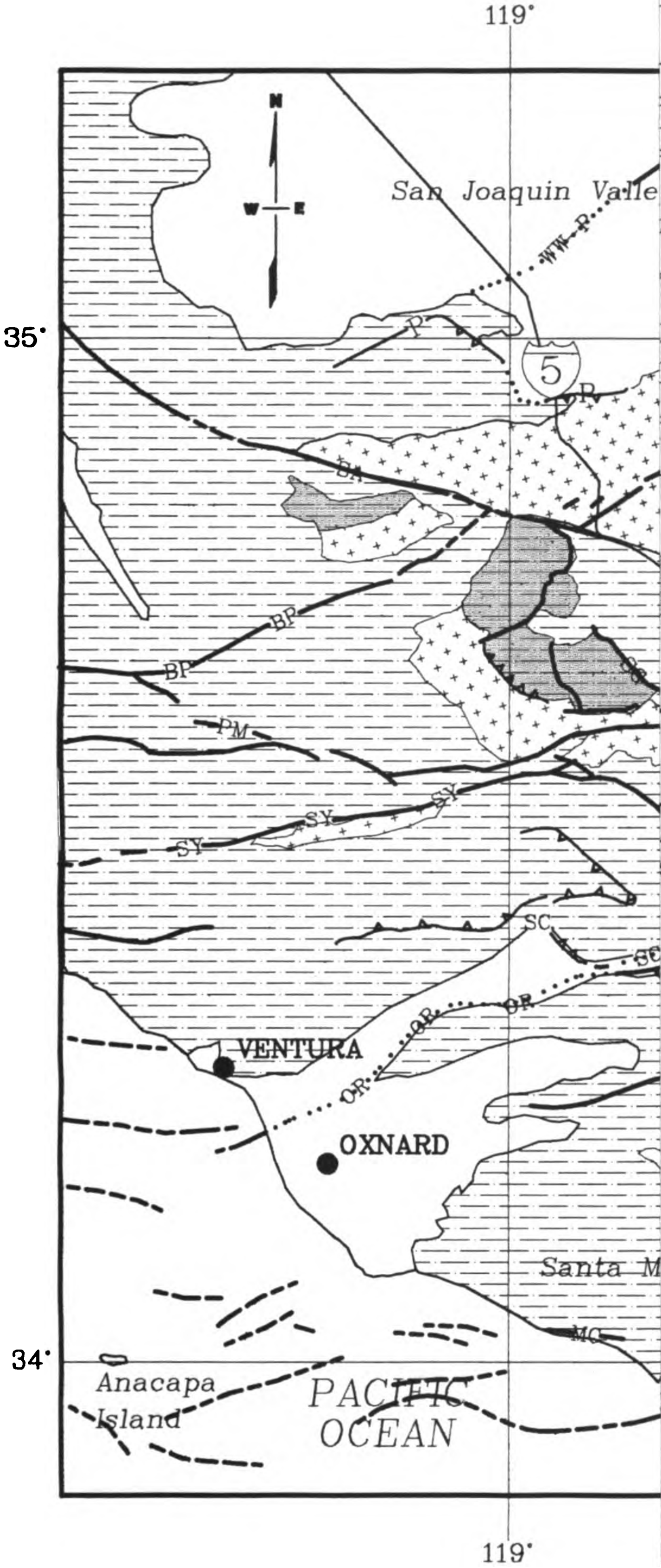
HISTORIC ANNUAL PRECIPITATION
NEWHALL WEATHER STATION



DAMES & MOORE

FIGURE 3



LOGIC LEGEND

Quaternary Deposits (may be Pliocene in part)

Tertiary Marine and Nonmarine Deposits (includes Volcanics in the Santa Monica Mountains)

Mesozoic rocks (mainly granitic but also includes metamorphic rocks, and marine sediments)

Mesozoic (?) Pelona Schist

Permo-Triassic Lowe Granodiorite

Precambrian anorthosite-syenite complex gneiss, and amphibolite (includes Mesozoi granitic intrusions)

Faults (dashed where approximate, dotted where concealed)

Thrust Faults (barbed on upper plate)

ULT INDEX

Big Pine
Cucamonga
Clearwater
Garlock
Helendale
Lockhart
Malibu Coast
Northridge Hills
Newport-Inglewood
Oak Ridge
Punchbowl
Pine Mountain
Raymond
San Andreas
San Cayetano
San Francisquito
Z San Fernando Fault Zone
San Gabriel; (N) North Branch; (S) South Branch
San Jacinto
Santa Monica
Z Sierra Madre Fault Zone
Z Santa Susanna Fault Zone
San Antonio
Santa Ynez
Vincent
Verdugo-Eagle Rock
Whittier Fault Zone
-P White Wolf - Pleito Fault Zone

GEN

Modified from Jennings, 1977

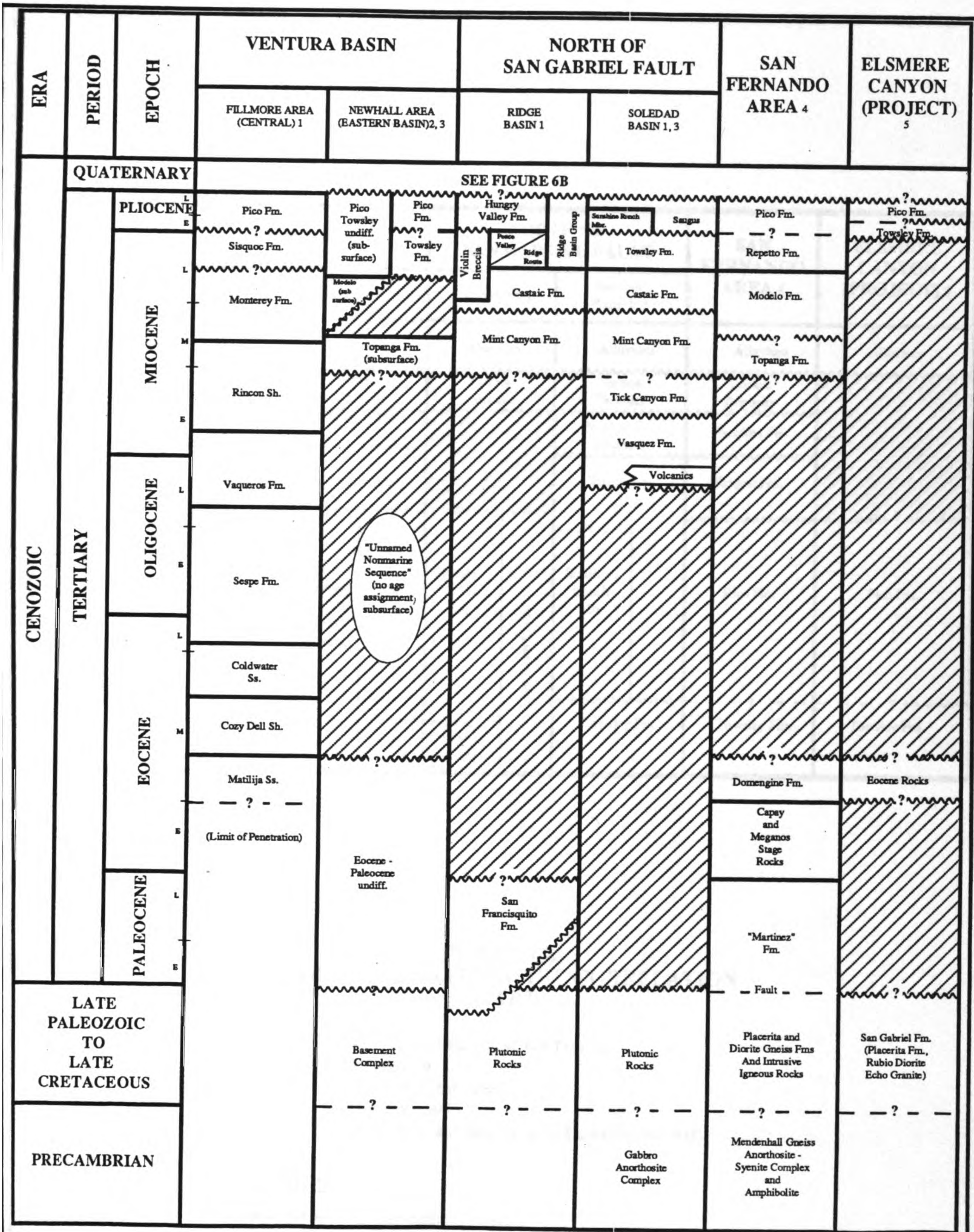


FIGURE 6A
REGIONAL STRATIGRAPHIC CORRELATION CHART

Source : 1) Childs, et.al,1984,COSUNA Project.
2) Nelligan, 1978.
3) Saul & Wootton, 1983.
4) Oakeshott, 1975.
5) James, 1991, and other mapping sources (see text).

(Symbols listed on Figure 6b)

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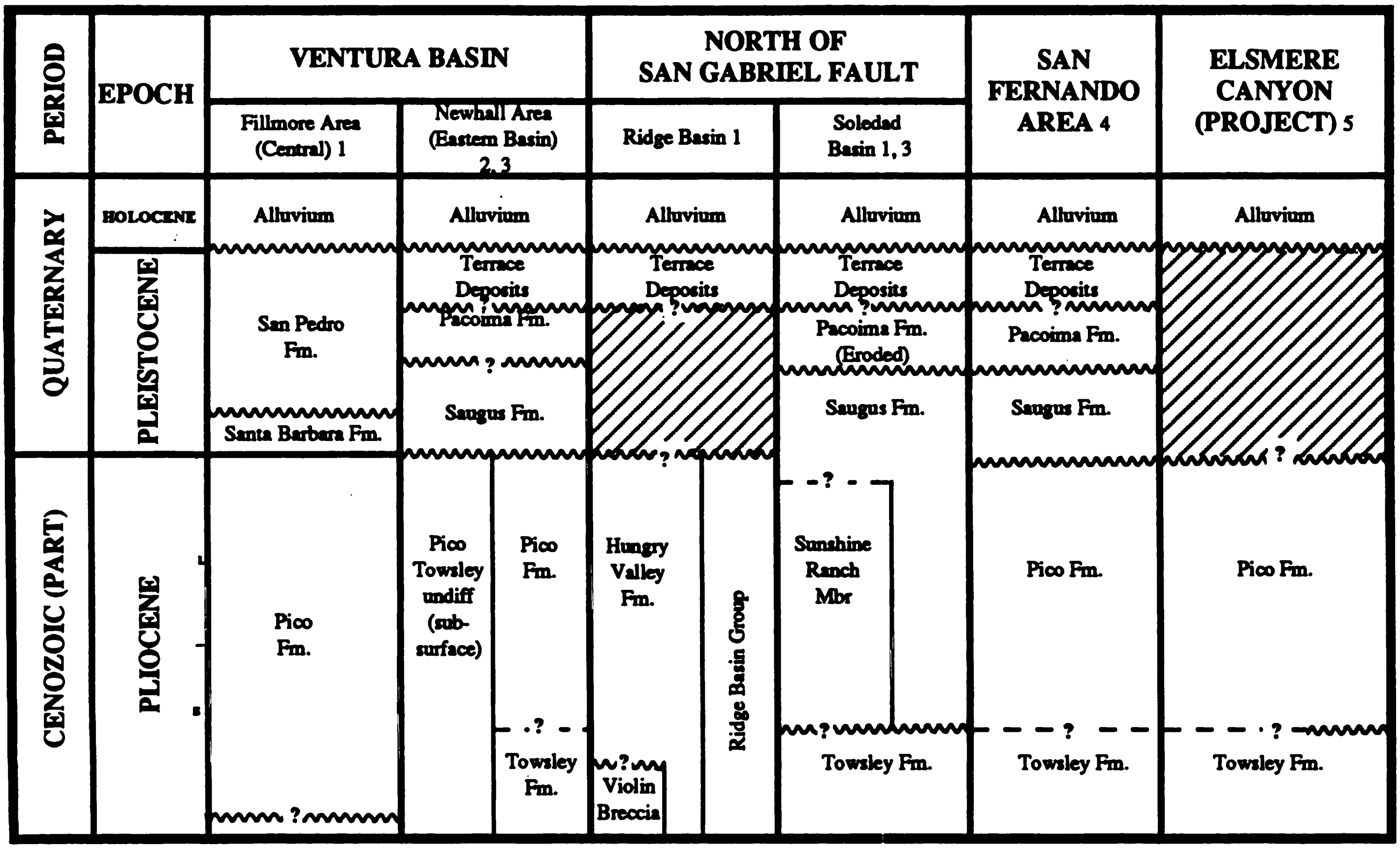


FIGURE 6B
REGIONAL STRATIGRAPHIC CORRELATION CHART

Source : 1) Childs, et.al,1984,COSUNA Project.
2) Nelligan, 1978.
3) Saul & Wootton, 1983.
4) Oakeshott, 1975.
5) Janes, 1991, and other mapping sources (see text).

SYMBOLS

Conformable Contact
Unconformable Contact
– – ? – – Contact Nature Unknown

Period of Non-Deposition and / or Erosion

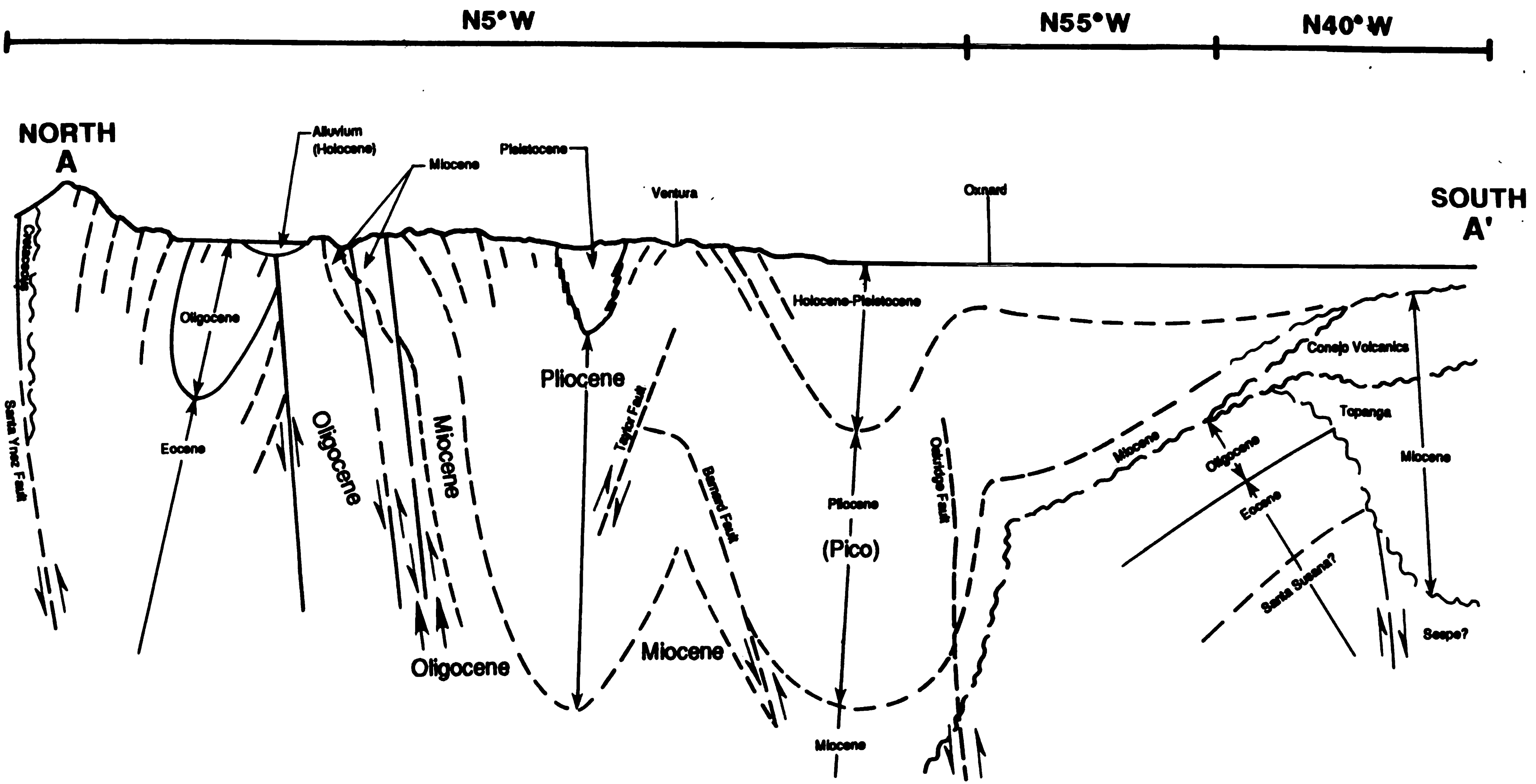


Figure 7

Generalized Cross Section
Central Ventura Basin

MODIFIED FROM : CALIFORNIA DIVISION OF OIL AND GAS, 1991
NOT TO SCALE
APPROXIMATE 2:1 VERTICAL EXAGGERATION
(SEE FIGURE 5 FOR LOCATION)

DAMES & MOORE

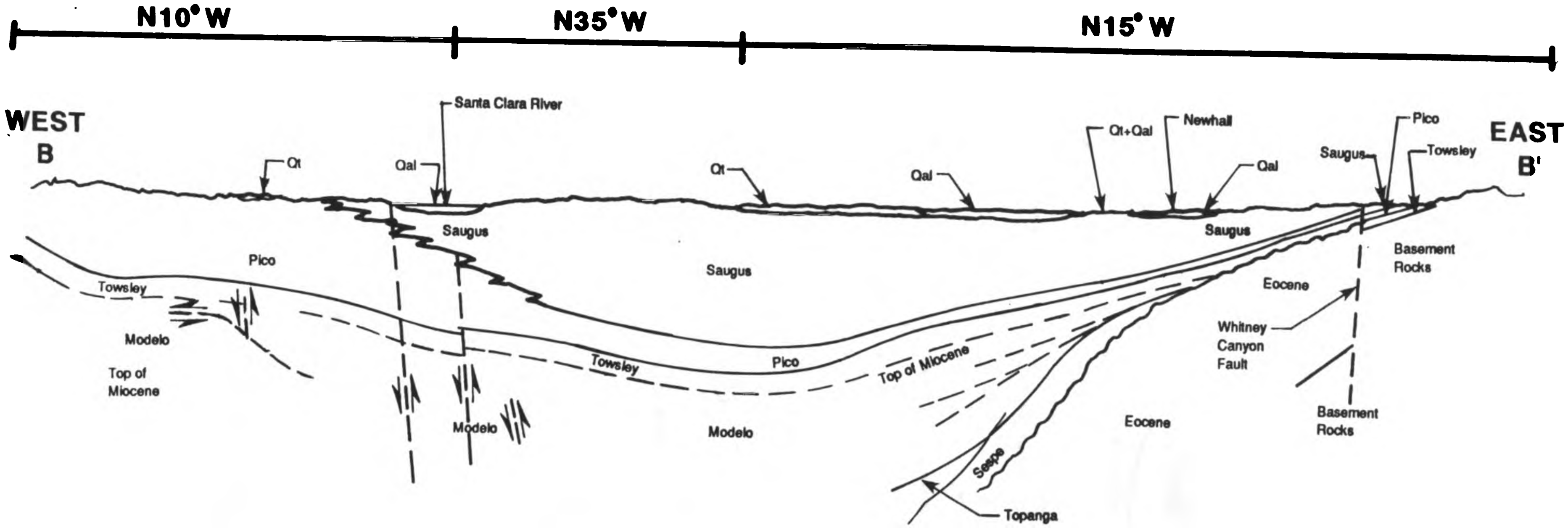


Figure 8

Generalized Cross Section
Eastern Ventura Basin

MODIFIED FROM : WINTERER AND DURHAM, 1962
NOT TO SCALE
NO EXAGGERATION
(SEE FIGURE 5 FOR LOCATION)

DAMES & MOORE

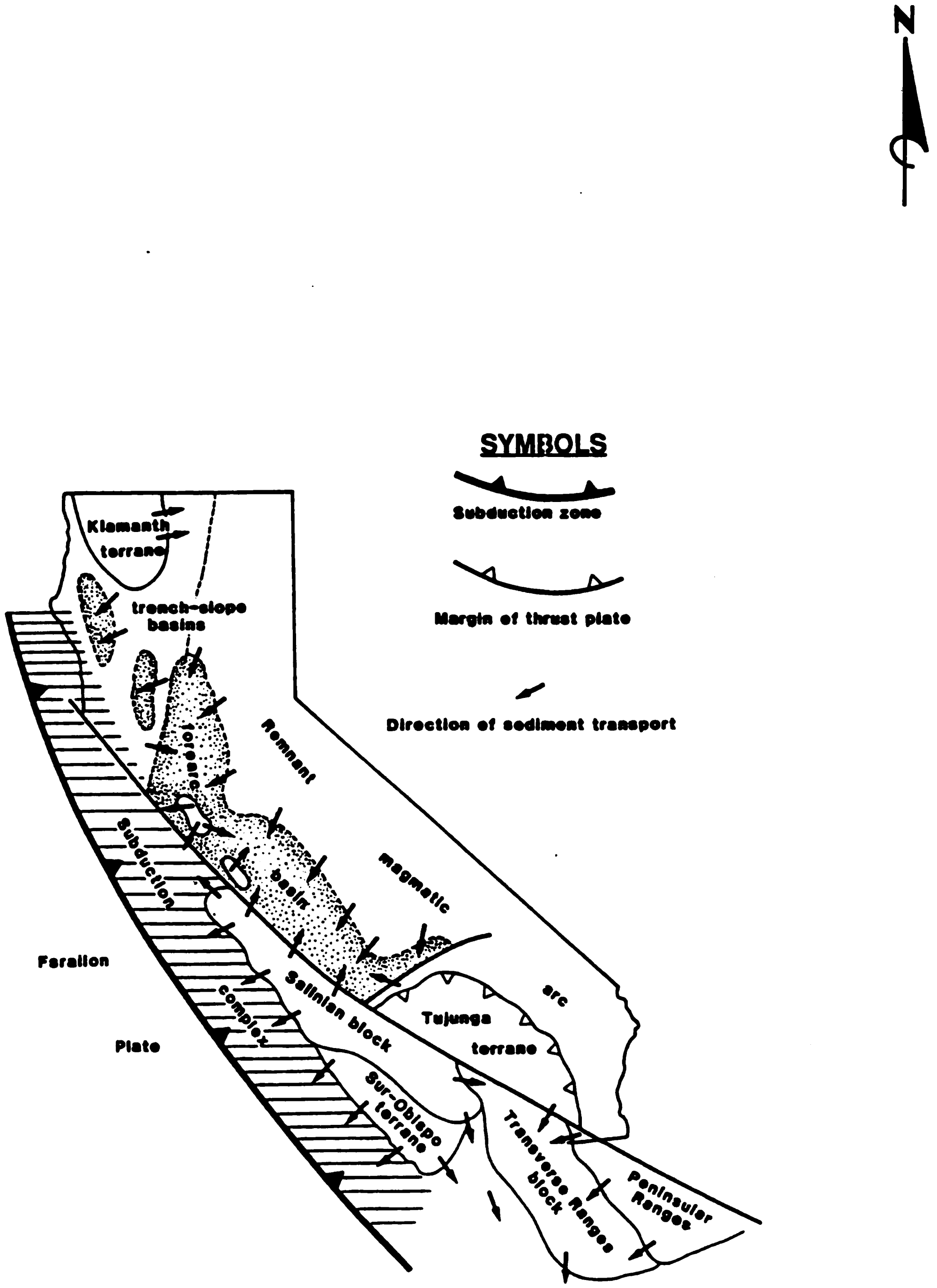


Figure 9
(NOT TO SCALE)

EOCENE PALEOTECTONIC MAP OF CALIFORNIA. THE GENERALIZED PALEOTECTONIC ELEMENTS ARE SHOWN IN THEIR EOCENE LOCATIONS AND ORIENTATIONS. (MODIFIED FROM NILSEN, 1987)

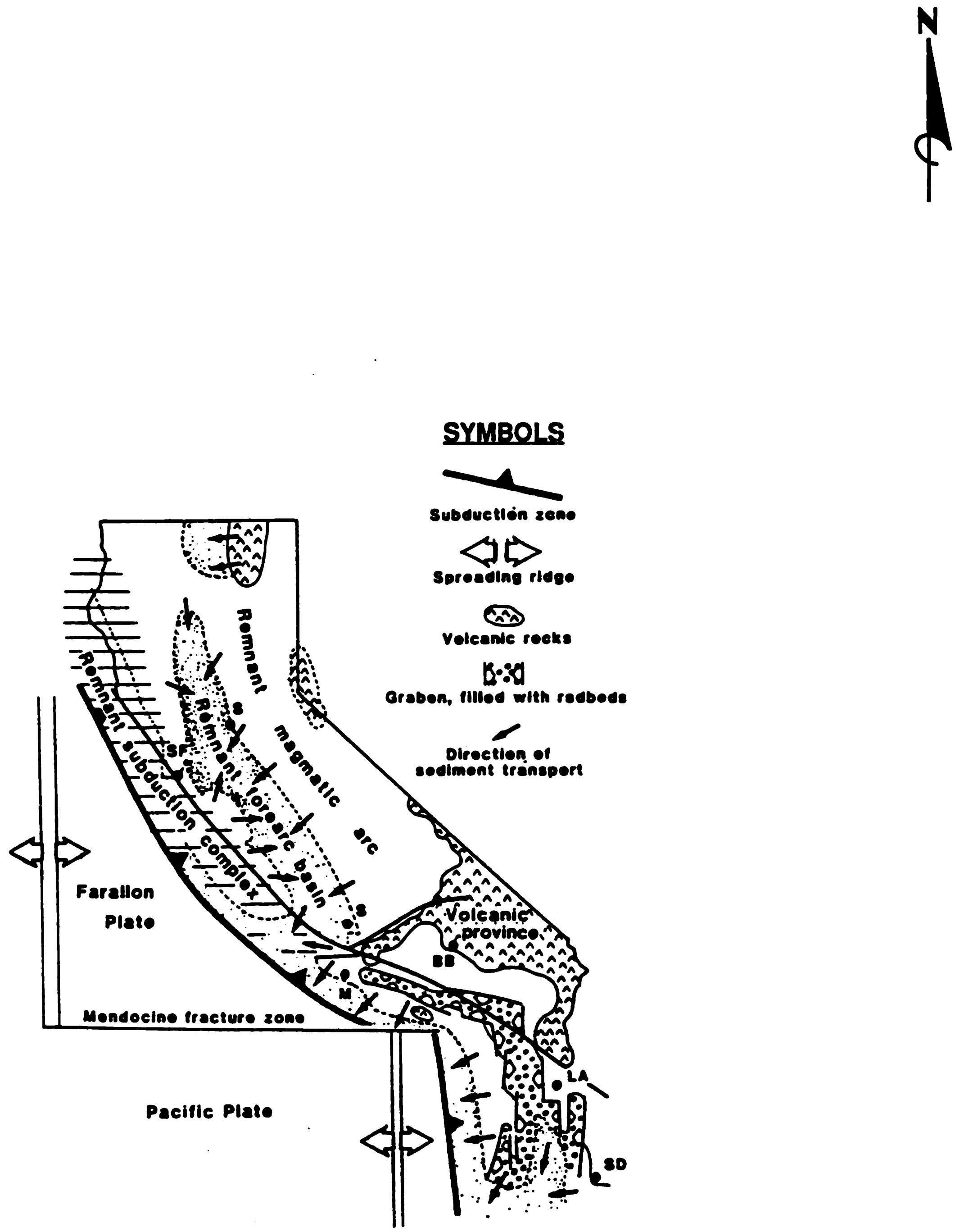
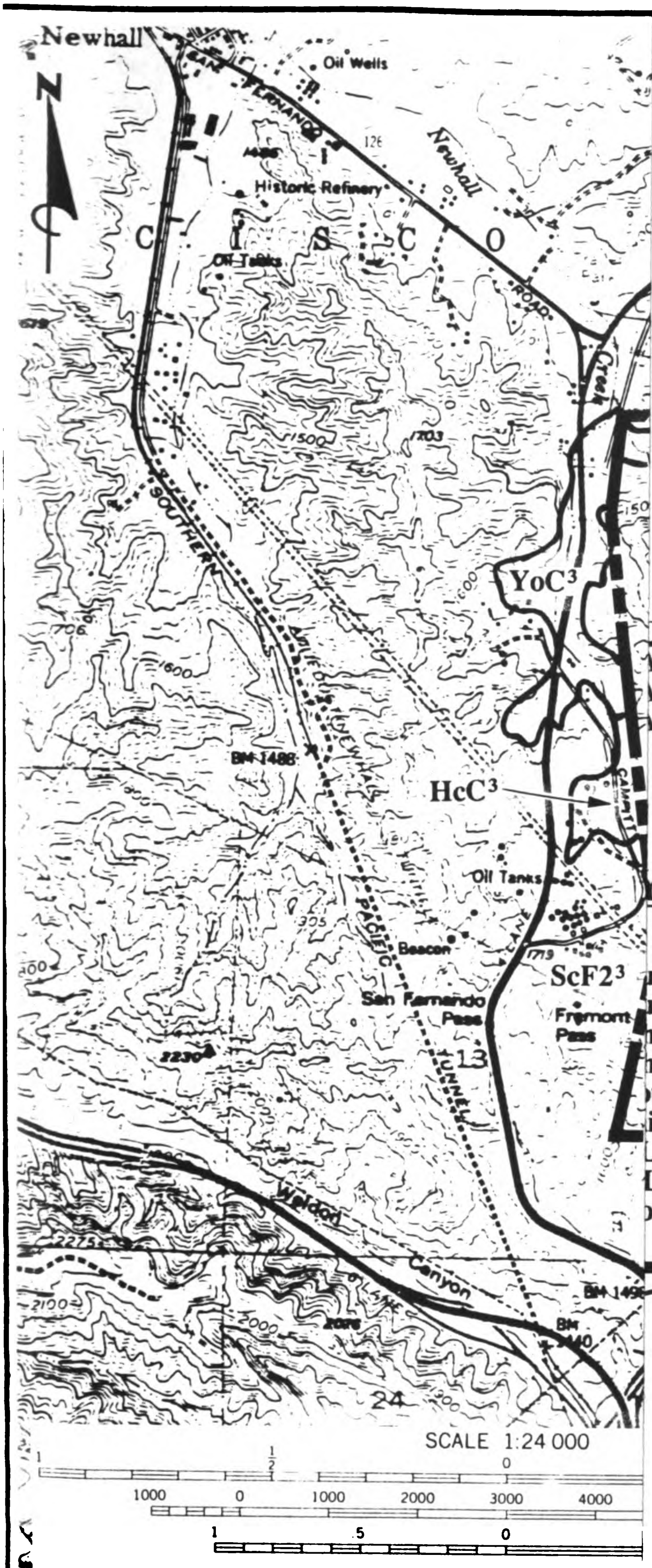


Figure 10
(NOT TO SCALE)

OLIGOCENE PALEOTECTONIC MAP OF CALIFORNIA. THE GENERALIZED PALEOTECTONIC ELEMENTS ARE SHOWN IN THEIR OLIGOCENE LOCATIONS AND ORIENTATIONS. (MODIFIED FROM NILSEN, 1987)



CONTOUR INTERVAL 25 FE

Base Map: USGS Topographic Map
Series of San Fernando, C
1966 PhotoRevised 1988.

…CES:
…, 1970)
…, 1969)
…, 1981)

…YPES

…us Loam, 30 to 50% slopes, eroded
…us Loam, 30 to 50% slopes
…holm Rocky Loam, 30 to 50% slopes, eroded
…holm Rocky Loam, 15 to 30% slopes, eroded
…ota Rocky Sandy Loam, 30 to 50% slopes, eroded
…ic and Saugus Soils, 30 to 50% slopes, severely eroded
…Loam, 30 to 50% slopes
…Loam, 2 to 9% slopes
…ord Sandy Loam, 2 to 9% slopes

PROJECT BOUNDARY
SOIL TYPE BOUNDARY

DAMES & MOORE

FIGURE 11
ELSMERE CANYON SOILS MAP

FIGURE 12

ional Hydrogeologic Map

2,000 4,000 6,000 8,000

SCALE IN FEET

Slade, 1988; includes Geology from Oakeshott (1958);
Durham (1962); Saul & Wootton (1983); and Janes (1992)

e or inactive in 1987 (Slade, 1988)

Monitoring Well

Well, (Slade, 1988)

Alluvium (undifferentiated)
Terrace Deposits
includes Pacoima Formation and Terrace Deposits
rer & Durham, 1962) or Saugus (Saul & Wooton, 1983)
tion
rmation
mation
n Formation
ocks

ntact

e Location of Fault; Dotted Where Inferred

vide

tprint

n San Fernando, Oat Mountain, Newhall
Canyon 7.5 USGSTopographic Maps;
24,000

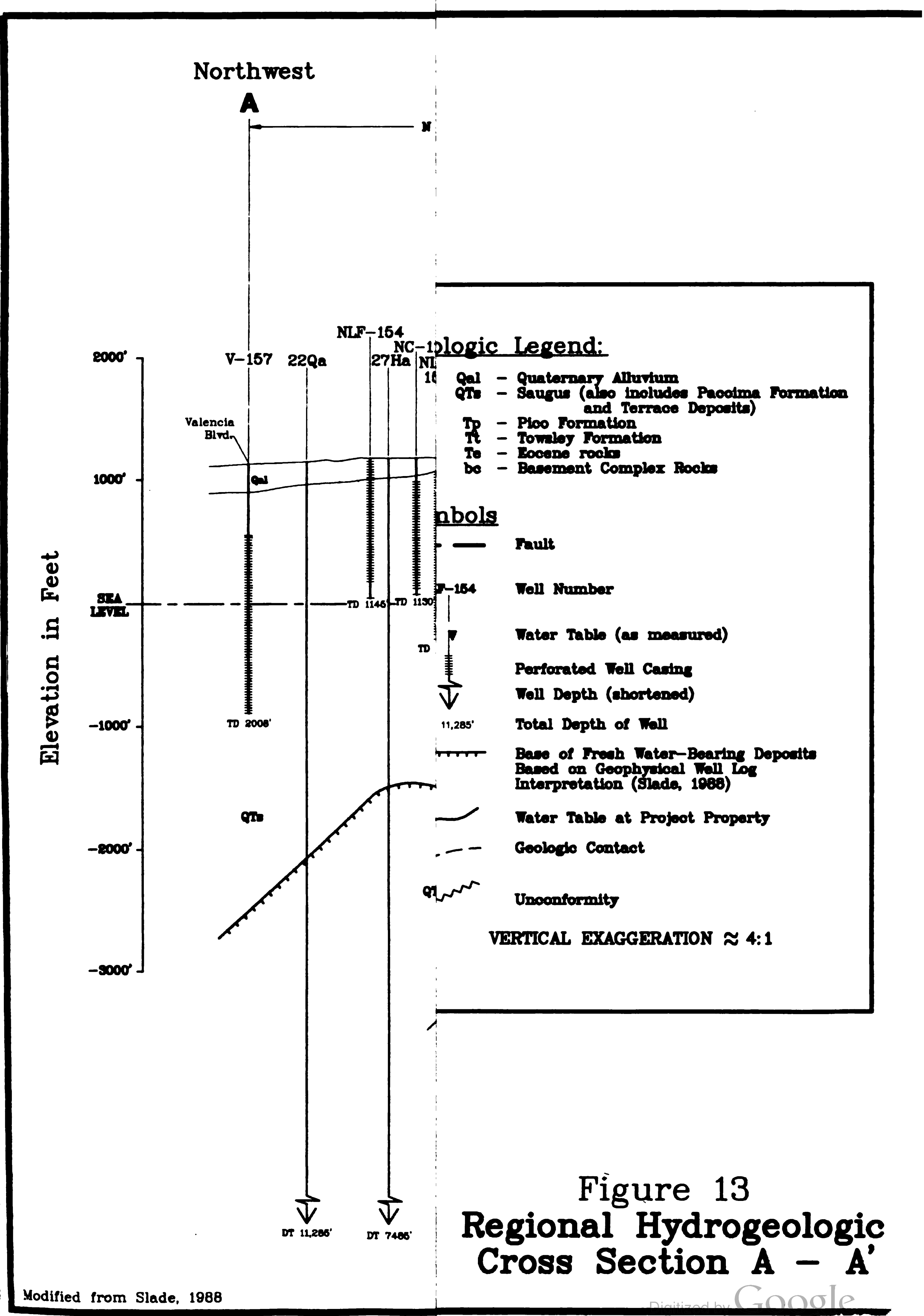
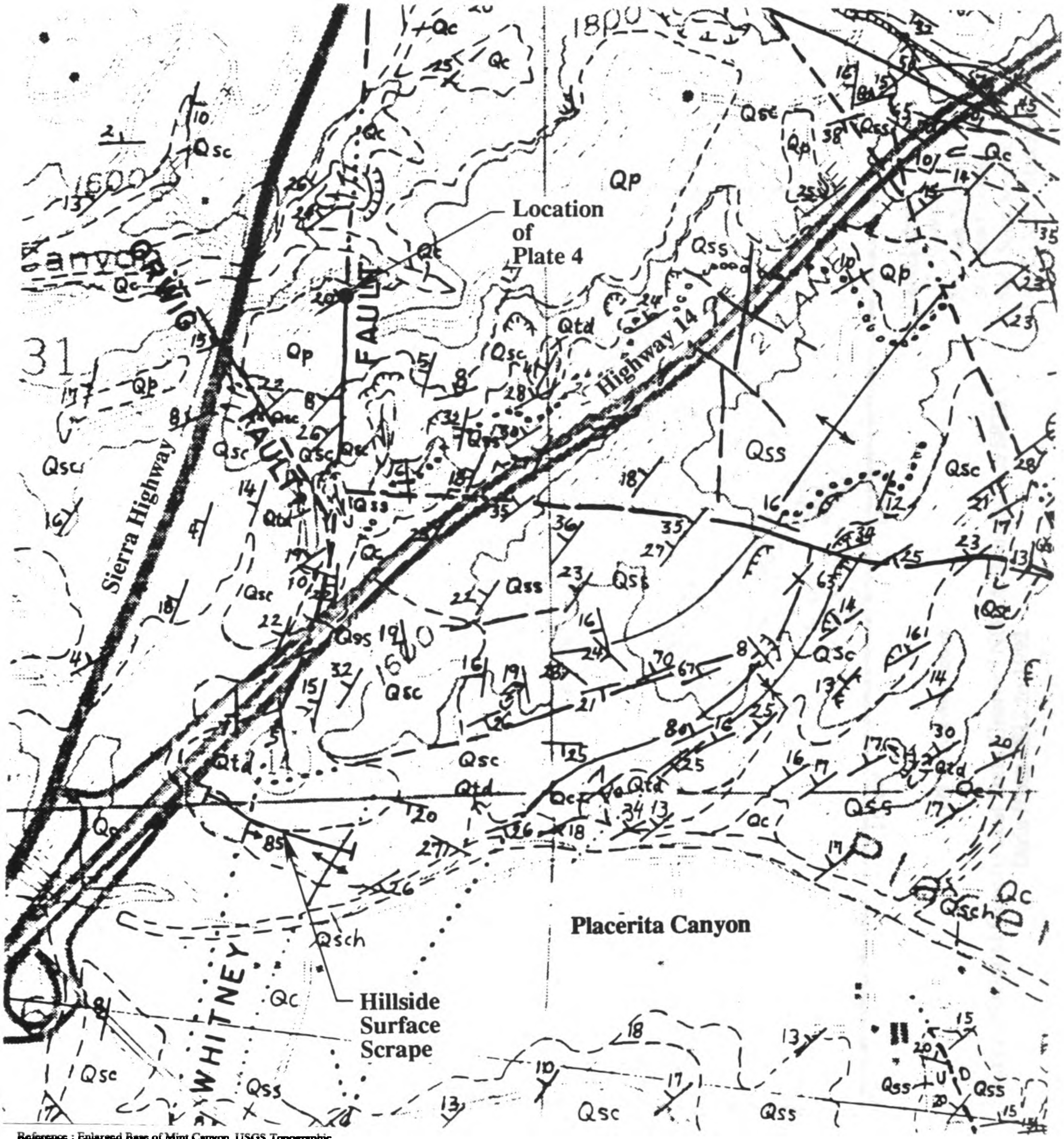


Figure 13
Regional Hydrogeologic Cross Section A – A'



Reference : Enlarged Base of Mint Canyon, USGS Topographic Quadrangle, 7.5 Minute Series; Scale 1 : 24,000, 1960, (Photo - revised 1974)

Figure 14

Whitney Canyon Fault - Placerita Canyon Area

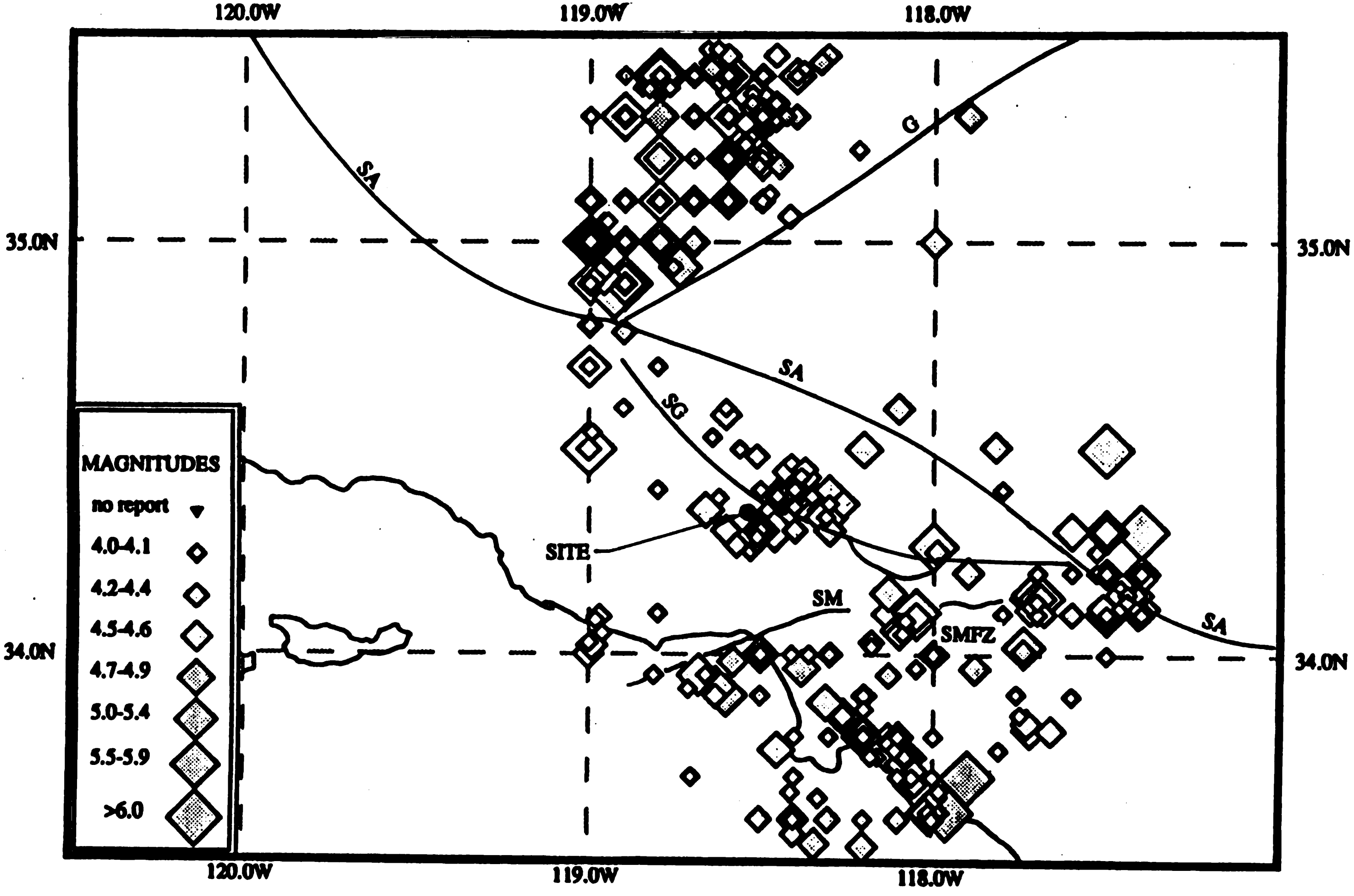
Geology from Saul & Wootton, 1983
Qc - Colluvium
Qtd - Terrace Deposits
Qp - Pacoima Fm.
Qs - Saugus Fm. (and various units)

SCALE 1:24,000

1 — 1/2 — 0 — 1 Mile

Figure 15

Regional Seismicity Within 110Km of Elsmere Canyon



1793 Earthquakes Plotted

Source: National Geophysical Data Center / NOAA Boulder, Co 80303
Data from 1812 to 1992

Fault Index
- G - Garlock
- SA - San Andreas
- SG - San Gabriel
- SM - Santa Monica
- SMFZ - Sierra Madre Fault Zone

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