Appendix J

Transportation Feasibility Study

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SANTA SUSANA FIELD LABORATORY PROJECT

Transportation Feasibility Analysis

Volume 1

Prepared for
Department of Toxic Substances Control

May 2017

Draft

Santa Susana Field Laboratory Project

Transportation Feasibility Analysis

Volume 1

Prepared for
Department of Toxic Substances Control

May 2017

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300
www.esassoc.com

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Acronyms and Abbreviations

AAR	Association of American Railroads
ABC	Articulated Bulk Container
AER	Annual Emissions Reporting
CDFW	California Department of Fish and Wildlife's
CEQA	California Environmental Quality Act
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CO	Carbon Monoxide
CSS	coastal sage scrub
CY	cubic yards
DOE	Department of Energy
DTSC	Department of Toxic Substances Control
ECDC	East Carbon Development Corporation
FTA	Federal Transit Administration's
GHG	Greenhouse Gases
LARWQCB	Los Angeles Regional Water Quality Control Board
MBTA	Migratory Bird Treaty Act
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
OHP	Office of Historic Preservation
PEIR	Program Environmental Impact Report
PPV	peak particle velocity
RMS	root mean square
ROC	Reactive Organic Compounds
ROW	Right of Way
RPs	Responsible Parties
RTG	rubber-tired gantry
SCAQMD	Southern California Air Quality Management District
SCCIC	South Central Coastal Information Center
SCE	Southern California Edison

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SCRRA	Southern California Regional Rail Authority
SR	State Route
SSFL	Santa Susana Field Laboratory
UPRR	Union Pacific Railroad
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service's
VCAPCD	Ventura County Air Pollution Control District
VOC	Volatile Organic Compounds

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Executive Summary

Because of public concern about traffic congestion, noise, air quality, and safety, related to increased haul truck traffic on Woolsey Canyon Road, the California Department of Toxic Substances Control (DTSC) is evaluating alternative routes and methods to transport soil from the Santa Susana Field Laboratory (SSFL) site to the regional transportation network. This report evaluates the feasibility and cost of developing potential soil transport options, specifically a new dedicated truck haul road, an overland conveyor system, and an aerial conveyor system, all extending from the project site through or paralleling existing private roads and across private property.

Summary of Initial Screening and Options Carried Forward for Detailed Analysis

The initial analysis of potential truck haul routes and conveyor routes included 11 separate corridors (see **Table 2-1**) that could be used to transport soil from the SSFL site; this analysis was conducted after the potential options were presented to the public in August 2014. These routes were screened and some routes were eliminated from further analysis based on factors such as proximity of residential areas, presence of public or private roadway connections as part of the route, presence of private reserve lands, and the ability of public roadways within each route to generally handle large trucks.

After this initial screening, four routes were selected for detailed analysis of their technical feasibility and potential environmental impact to be compared to the route evaluated in the Program Environmental Impact Report (PEIR) for the SSFL, Woolsey Canyon Road Truck Route. The routes evaluated in detail in this report include:

Woolsey Canyon Road Truck Route. This route is the proposed truck route for the SSFL project which is evaluated in the PEIR. Haul trucks would travel through existing roadways within Ventura and Los Angeles Counties to State Route (SR) 118 or US 101. This route is included for analysis as a baseline point of comparison for the four potential options listed below.

Edison Road Truck Route. This truck route consists of an existing private roadway that extends from the north side of the SSFL site to Guardian Street to Tapo Canyon Boulevard in Simi Valley to SR 118. This private road would be improved with pavement and would be used in conjunction with Woolsey Canyon Road. This route would be used to transport contaminated soil from the SSFL site and to deliver clean backfill to the site.

Edison Road Overland Conveyor. This conveyor to truck option consists of constructing an overland conveyor along Edison Road that would transport soil from the west side of the SSFL site to a truck transfer site located in Simi Valley at Guardian Street and Tapo Canyon Boulevard. Trucks would be loaded with contaminated soil and would travel to disposal facilities via Tapo

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Canyon Boulevard to the SR 118. Under this potential option, clean backfill would either be transported to SSFL via the conveyor or by truck via Woolsey Canyon Road. [1]

North American Cutoff Road Overland Conveyor. This conveyor to rail option consists of constructing an overland conveyor along North American Cutoff Road that would transport soil from the east side of the SSFL site to a rail transfer site located in Simi Valley. Contaminated soil would be loaded into covered gondola cars which would be stored on a new rail siding to be constructed adjacent to the existing UPRR railroad. One to two trains would depart the facility each week to deliver contaminated soil to disposal sites in Oregon (hazardous waste) or Utah (non-hazardous waste). Under this potential option, clean backfill would be transported to the SSFL site by truck via Woolsey Canyon Road.[2]

North American Cutoff Road Aerial Conveyor. This conveyor to rail option consists of constructing an aerial conveyor along North American Cutoff Road that would transport soil from the east side of the SSFL site to a rail transfer site located in Simi Valley (the same rail site identified for the North American Cutoff Road Overland Conveyor route). Under this potential option, clean backfill would be transported to the SSFL site by truck via Woolsey Canyon Road.

Summary of Technical Evaluation and Environmental Analysis

To assess technical feasibility of construction and operation, the five options were evaluated for the following criteria:

- Required Land Acquisition or Right-of-Way (ROW)
- Technological Feasibility
- Permitting Constraints
- Implementation Schedule
- Construction Equipment and Workforce
- Cost

[1] Use of the conveyor for transport of clean backfill would require installation of a washing and drying system at the conveyor terminus to ensure backfill is not contaminated by materials from excavated soils. This system would increase the development cost of this alternative by as much as $11 million. Delivering backfill to the truck site, would also require additional soil handling (unloading clean backfill to a stockpile, loading the conveyor from the stockpile, conveying the material to the SSFL site, unloading the conveyor to a stockpile, loading trucks from the stock pile, and delivering to the location where the fill is needed. This additional handling would increase the total operational cost by approximately $8 million compared to delivering backfill by truck directly to the locations where fill is needed.

[2] Access to Rail Transfer Site 2B would be from Smith Road, a local street that is lined with single family residences. Due to (1) width of this residential roadway, (2) proximity of residences to the road, (3) the size and configuration of the rail site cannot reasonably accommodate stockpiled backfill, and (4) the additional handling of backfill, (i.e. emptying trucks at the rail site, transporting backfill from a stockpile to the conveyor, conveying the material to SSFL, conveying from the conveyor to stockpile/truck), and (4) the additional handling of backfill, transport to Rail Transfer Site 2B by truck of clean backfill for conveyance to SSFL is not considered in this analysis.

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The environmental analysis of construction and operation of each route considered potential impacts related to:

- Air Quality and Greenhouse Gases (GHG)
- Biological Resources
- Cultural Resources
- Energy Consumption
- Land Use Compatibility
- Noise
- Traffic

Conclusion

In terms of feasibility (i.e., land access, technological feasibility, rail logistics, permitting constraints, implementation schedule and cost), the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

This report analyzed each of the routes in terms of potential effects and issues related to environmental resources, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Overland Conveyor
3. North American Cutoff Road Overland Conveyor
4. North American Cutoff Road Aerial Conveyor
5. Edison Road Truck Route

1.0 Introduction

This section presents the overall organization of this Transportation Feasibility Analysis, provides an overview of the SSFL project and background information relative to this Transportation Feasibility Analysis.

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1.1 Report Organization

This report is organized as follows:

Section 1.0 Introduction. This section presents the background of why this analysis was prepared.

Section 2.0 Potential Transport Routes Feasibility Analysis. This section presents the results of the initial screening applied to the potential options presented at the August 2014 public meetings (Section 2.1), explaining which routes were considered for more detailed analysis and why other routes were removed from further consideration. Section 2.2 of this report presents the results of the technical analysis of the routes retained after the initial screening.

Section 3.0 Environmental Analysis. This section evaluates potential environmental issues and environmental effects associated with development and operation of each feasible transport and conveyance route discussed in Section 2.2.

Section 4.0 Comparison of Feasible Transportation Options. This section provides a comparison of the technological and environmental analyses conducted for the potential transportation options evaluated in Section 2.2 and Section 3.0 of this report.

Section 5.0 Summary. This section summarizes the comparison presented in Section 4.0 and presents a ranking of the Feasible Transportation Options based on the results of the technological and environmental analyses.

Section 6.0 Preparers. This section lists the preparers of this report.

Section 7.0 References. This chapter presents a listing of all sources of information used in the preparation of this report.

1.2 Santa Susana Field Laboratory Cleanup Project

DTSC is the lead state regulatory agency overseeing cleanup of contaminated soil and groundwater at the SSFL. The National Aeronautics and Space Administration (NASA), Department of Energy (DOE), and the Boeing Company are the Responsible Parties (RPs) for implementing the cleanup project. The overall site cleanup of SSFL would require excavation and transport of approximately 2,523,000 cubic yards (CY) of soil from the SSFL site using approximately 165,000 truck trips. Implementation of the project would also require limited backfilling of excavations. The estimated quantity of backfill that would be imported to the site is approximately 1,366,000 CY which would require approximately 88,000 truck trips. This would results in a total of approximately 253,000 haul truck trips (excavation spoils and backfill combined) operating for approximately 15 years (assuming a daily range of 48 to 96 trucks per day, 21 days per month).

1.3 Background of Feasibility Analysis

Currently, the only public roadway access to the SSFL site that is feasible for haul truck traffic is Woolsey Canyon Road. Because of public concern about traffic congestion, noise, air quality, and safety, related to increased haul truck traffic on Woolsey Canyon Road, DTSC is evaluating

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alternative routes and methods to transport soil from the SSFL site to the regional transportation network. This report evaluates the feasibility and cost of developing potential soil transport options, specifically a new dedicated truck haul road, an overland conveyor system, and an aerial conveyor system, all roughly paralleling existing private roads or other ROWs.

The SSFL site is at a higher elevation than surrounding open lands and neighborhoods. Downhill grades located at the perimeter of the site significantly impact the feasibility of new roadways or conveyor routes (steep slopes require extensive grading and/or complicated switchback patterns for roadway construction or long segment runs for conveyors). At the bottom of the hillsides that flank the SSFL site to the north are public roadway connections and an east-west railroad corridor. The railroad is owned by the Southern California Regional Rail Authority (SCRRA), and Union Pacific Railroad (UPRR) has an access agreement for trains that use the corridor to serve local industrial customers.

Existing roadway connections are located on the east side of the site. Those roadways are a focus of the transportation analysis within the PEIR being prepared for SSFL. Two feasible routes evaluated in this analysis were included in the environmental alternatives analysis of the PEIR. It is important to note that implementation of any of the routes evaluated in this analysis would require additional environmental review under CEQA. If one of these routes were selected for implementation, soil excavation and transport offsite by truck via Woolsey Canyon Road would begin upon DTSC's certification of the PEIR and approval of the Program Management Plan and would continue until the selected route became operational.

1.4 Public Outreach

In August 2014, DTSC conducted two public meetings to inform the community that it was undertaking an analysis of alternative transportation routes and methods to transport excavated soil from the SSFL site. DTSC also solicited community input on additional types of transportation options (routes and methods) and presented 10 potential truck haul routes and two potential conveyor routes to be further evaluated for feasibility of development and use to transport soil from the site.

The potential options presented at the August 2014 meetings were screened for general feasibility, basic engineering and logistical factors, access, and community input from the public meetings.

This Transportation Feasibility Analysis reviews the practical feasibility, and possible complicating factors, of transporting contaminated soil from SSFL to nearby rail and highway corridors, for further transit to remote disposal facilities. The analysis leading up to this report involved a screening of the potential options (presented in Section 2.1), which included consideration of comments received from the public at the August 2014 public meetings; and then examined three viable concepts for transporting within the northern hillside areas—truck, overland conveyor, and aerial conveyor methods—and analyzed the practical implementation and rough magnitude of costs for each method.

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1.5 Assumptions

1.5.1 Soil Volumes

As shown in **Table 1-1**, implementation of the SSFL project would require excavation and transport of approximately 2,523,000 CY of soil from the SSFL site. The estimated quantity of backfill that would be imported to the site is approximately 1,366,000 CY.

As shown in **Table 1-2**, it is assumed that contaminated soil would be excavated at a rate ranging between 413 CY per day and 1,027, CY per day and that clean backfill would be delivered to the site at a rate ranging between 245 CY per day and 444 CY per day. These volumes correlate to the daily truck volumes shown in Table 1-2.

TABLE 1-1
SSFL CLEANUP PROJECT SOIL VOLUMES

Soil Type [a]	NASA (CY)	DOE (CY)	Boeing (CY)	Total (CY)
Radiologic	26,000	91,000	17,000	134,000
Hazardous	696,000	49,000	63,000	808,000
Non-hazardous	148,000	1,123,000	310,000	1,581,000
Total Contaminated Soil	**870,000**	**1,263,000**	**390,000**	**2,523,000**
Backfill	290,000 [b]	947,000 [c]	129,000 [b]	1,366,000
Disposal + Backfill	**1,160,000**	**2,210,000**	**519,000**	**3,889,000**

Notes:
All number rounded to nearest 1,000.

a. Soil waste type ratios are based on historical interim source removal actions and correspondence between each RP and DTSC (NASA, 2015c), (Boeing 2015a), (DOE, 2017).

b Boeing and NASA estimate backfill volume to be approximately 1/3 of the total excavation volume.

c DOE estimates backfill volume to be approximately 3/4 of the total excavation volume. The additional backfill percentage compared to Boeing and NASA's areas is to account for deeper excavations required in DOE's areas of responsibility.

TABLE 1-2
SOIL EXCAVATION AND BACKFILL DELIVERY RATES [a]

	Excavation		Backfill		
Years	Daily Rate (BCY/day)	Daily Truck Volume [b]	Daily Rate (BCY/day)[c]	Daily Truck Volume	Total Daily Truck Volume [d]
1–2	736	48	245	16	**64**
3–4	1,027	67	444	29	**96**
5–10	781	51	444	29	**80**
11–15	413	27	321	21	**48**

[a] Rates based on DTSC engineers estimate

[b] Truck trips calculated assuming truck volume capacity of 15.33 CY per truck (23 tons per truck load, and 1.5 tons per in situ CY of soil).

[c] BCY = bank cubic yards (the measurement of 1 CY of earth in its natural state before it is removed from the ground)

[d] Excavation trips + Backfill Trips

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For all options evaluated in this analysis, it is assumed that soil excavation and transport offsite by truck via Woolsey Canyon Road would begin upon DTSC's certification of the PEIR and approval of the Program Management Plan and subsequent cleanup decision documents. If one of the transportation options evaluated in this report were to be used to transport contaminated soil from SSFL, it would take approximately 45 to 48 months to plan, permit (including full environmental review), and construct the selected option. During that 45- to 48-month period, and as a shown in **Table 1-3**, approximately 822,000 CY[3] of contaminated soil would be excavated and transported from the site and approximately 326,000 CY[4] of backfill would be transported to the site, for a total of approximately 1,148,000 CY of soil to be transported (excavation spoils and backfill) to and from the SSFL site.

TABLE 1-3
INITIAL CLEANUP ACTIVITIES SOIL VOLUMES

Soil Type	NASA (CY)	DOE (CY)	Boeing (CY)	Total (CY)
Radiologic	10,000	91,000	17,000	118,000
Hazardous	278,000	5,000	59,000	342,000
Non-hazardous	59,000	32,000	271,000	362,000
Total Contaminated Soil	**347,000**	**128,000**	**347,000**	**822,000**
Backfill	115,000 [a]	96,000 [b]	115,000 [a]	326,000
Disposal + Backfill	**462,000**	**224,000**	**462,000**	**1,148,000**

Notes:
All number rounded to nearest 1,000.
[a] Boeing and NASA estimate backfill volume to be approximately 1/3 of the total excavation volume.
[b] DOE estimates backfill volume to be approximately 3/4 of the total excavation volume. The additional backfill percentage compared to Boeing and NASA's areas is to account for deeper excavations required in DOE's areas of responsibility.

As shown in **Table 1-4**, after 45 months of cleanup operations at the project site, the amount of soil remaining to be excavated and transported from the site would be approximately 1,701,000 CY and the remaining amount of backfill to be transported to the site would be approximately 1,023,000 CY (see Table 1-4). **Table 1-5** shows a summary of the different types of contaminated soil to be excavated and transported from the project site.

[3] This schedule assumes a soil excavation rate of 736 CY/day for the first 24 months of operation and 1,027 CY/day for the following 21 months.

[4] This schedule assumes a backfill delivery rate of 245 CY/day for the first 24 months of operation and 444 CY/day for the following 21 months.

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TABLE 1-4
SUMMARY OF SOIL EXCAVATION AND BACKFILL VOLUMES

Project [a]	Excavation	Backfill	Total
Overall SSFL Cleanup Project (15 years)	2,523,000	1,349,000	3,872,000
Initial Projects (1st 45 months)	822,000	326,000	1,148,000
Balance (Overall - Initial Projects)	**1,701,000**	**1,023,000**	**2,724,000**

Notes:
All number rounded to nearest 1,000.
[a] These schedules assume a soil excavation rate of 736 CY/day for the first 24 months of operation and 1,027 CY/day for the following 21 months, and a backfill delivery rate of 245 CY/day for the first 24 months of operation and 444 CY/day for the following 21 months.

TABLE 1-5
SUMMARY OF CONTAMINATED SOIL VOLUMES

Project	Hazardous	Non-hazardous	Radiologic [a]	Total
Overall SSFL Cleanup Project (15 years) [b]	808,000	1,581,000	134,000	2,523,000
Initial Projects (1st 45 months) [b]	342,000	362,000	118,000	822,000
Balance (Overall - Initial Projects)	**466,000**	**1,219,000**	**16,000**	**1,701,000**

[a] Radiologic material is expected to be excavated and transported to disposal facilities during the first 45 months of operation and therefore would not be shipped by rail. If a rail option were selected, the remaining 16,000 CY of radiologic material would be transported by truck. Therefore, the approximate total volume of contaminated soil expected to be available for rail transport would be 1,685,000 (the total remaining volume of 1,701,000 less 16,000 CY of radiologic material).
[b] These schedules were developed based on the excavation and backfill rates presented in Table 1-2

1.5.2 Disposal Facilities for Potential Transportation Options

1.5.2.1 Truck Transport

All radiologically contaminated soil would be excavated and transported by truck to facilities in Nevada or Utah that are approved to accept low level radioactive waste. Hazardous and non-hazardous soil to be transported by truck would go to various disposal facilities located in California, Utah, Nevada, and possibly other states. The RPs have identified a number of potential facilities for disposal of soil, sediments, and other remediation-related wastes to be removed from the site, including facilities that accept non-hazardous waste, hazardous waste, and wastes that are contaminated with radionuclides. The RPs, under the direction of DTSC, would use a variety of factors, to determine which disposal facilities to use, such as waste acceptance criteria, cost, proximity, and availability, among other considerations. The specific disposal facilities that would be used by the RPs have not been identified. Therefore, to provide a

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conservative analysis, it was assumed that the following types of waste would be transported to facilities located at the following average distances from the SSFL site:[5]

- Non-hazardous material – 120 miles (240 miles roundtrip)
- Hazardous material – 310 miles (620 miles roundtrip)
- Radiologic material – 450 miles (900 miles roundtrip)

1.5.2.2 Rail Transport

This analysis evaluates the feasibility of rail transport from the SSFL site to the railway network. Of the waste disposal facilities being considered by the RPs, only Energy Solutions in Clive, Utah has direct rail access: however, this facility only accepts radiologic waste and radiologic waste from SSFL would not be transported by rail. Sixteen of the waste disposal facilities identified by the RPs are located within 80 miles of a rail line (eight of which are within 30 miles of a rail line). However, no existing transfer facilities have been identified near any of the disposal facilities and construction and permitting of a new transfer facility in California is not feasible or within the scope of this project.

If one of the rail options were chosen, non-hazardous soil would be shipped to East Carbon Development Corporation (ECDC) in East Carbon, Utah (located approximately 900 miles from SSFL by rail), and hazardous soil would be shipped to Waste Management in Arlington, Oregon (located approximately 1,550 miles from SSFL by rail). These two facilities have been identified as the closest facilities to SSFL that accept hazardous and non-hazardous waste directly by rail and are the two facilities considered in this analysis.

Currently a source for backfill has not been identified, so it is assumed all backfill would be transported to the site via truck, even if a rail option were selected for transport of excavated soil.

Gondola cars (open-topped rail cars used for transporting loose bulk materials (see **Figure 1** and **Figure 2**) have a capacity of 100 to 105 tons (railcar rating for most railcar types is, by convention, expressed in tons, not volumetric capacity). This equates to approximately 67 to 70 bank CY[6] of soil per car (assuming 1.5 tons per CY). Soil density in the gondola cars can vary widely, depending upon the soil properties, including moisture content and soil type of the loose material.

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5 These distances were calculated by selecting the second closest disposal facility identified by each RP for each type of waste, and calculating the average distance traveled based upon the total volume to be transported to each facility. Disposal facilities considered in this analysis include: Clean Harbors Buttonwillow (CA); Azusa Land Reclamation (CA); Chemical Waste Management, Kettleman Hills Facility (CA); Clean Harbors Westmoreland (CA); La Paz County Landfill (AZ); Clean Harbors Grassy Mountain (UT); Nevada National Security Site (NV).

6 A bank CY is the calculation or measurement of 1 CY of earth in its natural state before it is removed from the ground.

Figure 1
Uncovered Gondola Car
Shown for reference and perspective, all SSFL related waste would be covered or sealed for transport.

It is also assumed that railcars would move in "unit trains," which are generally composed of 60 or more railcars that move together from origin to destination and return with no intermediate switching. Thus, unit trains offer a simpler operating scheme and more reliable travel times compared to shipping individual railcars; individual railcars would have to be incorporated into other trains and thus subject to switching at intermediate points.

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Figure 2
Covered Gondola Car

2.0 Potential Transport Routes Feasibility Analysis

This section describes the screening analysis used to identify which transportation, routes, technologies, transfer sites and disposal facilities are reasonably feasible to implement/use for the overall cleanup of SSFL. This section also provides a technical evaluation for the routes, technologies, transfer sites and disposal facilities considered to be feasible in the screening analysis.

2.1 Screening

The initial analysis of potential truck haul routes and conveyor routes included 11 separate corridors (see **Table 2-1**) that could be used to transport soil from the SSFL site; this analysis was conducted after the potential options were presented to the public in August 2014. The truck haul routes and some conveyor routes were defined based on existing access roads that currently access areas adjacent to the site, as well as on public comments. The overland conveyor routes presented in August 2014 were defined based on the report prepared for NASA titled *Feasibility Study – Alternative Contaminated Soil Transport and Disposal Options* (NASA 2013).

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TABLE 2-1
PRELIMINARY ALTERNATIVE TRANSPORTATION ROUTES

Route #	Route Name
1	Montgomery Fire Road to southwest
2	Montgomery Fire Road northwest to Simi Valley
3	Runkle Haul Road
4	Arness Fire Road
5	Black Canyon Road
6	North American Cutoff Road
7A	Woolsey Canyon via Plummer
7B	Woolsey Canyon via Roscoe
8A	Bell Canyon Road via Stagecoach Road
8B	Bell Canyon Road via Saddlebow Road
9	Edison Road Corridor
10	Western Conveyor Route
11	Eastern Conveyor Route

Note: Route numbers correspond to those shown in **Figure 3**.

These routes were screened and some routes were eliminated from further analysis based on factors such as proximity of residential areas, presence of public or private roadway connections as part of the route, presence of private reserve lands, and the ability of public roadways within each route to generally handle large trucks.

Table 2-2 provides a matrix of evaluation factors and characteristics of each route, such as linear length on new corridors, length on public roads, miles adjacent to residential areas, number of adjacent schools, and miles to freeway access points or to transfer sites. The sections following Table 2-2 provide the analysis of each route that was the basis for the screening process.

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TABLE 2-2
FIRST-ROUND ROUTE EVALUATION, INITIAL FEASIBILITY ANALYSIS

Transport Routes	Miles to Freeway (Total Truck Route)	Miles on Private / Dirt Roads	Miles on Public Roads	Miles Adjacent to Residential Areas	Number of Adjacent Schools	Route Requires Easement	Potential One-Way Offsite Operations	Percent of Route with ≥ 27% Grade
1. Montgomery Fire Road to southwest	9.34	6.68	2.66	2.35	1	Yes	Yes	17%
2. Montgomery Fire Road northwest to Simi Valley	7.66	3.55	4.11	3.68	1	Yes	Yes	18%
3. Runkle Haul Road – Sequoia Avenue	5.84	0.93	4.91	4.27	0	Yes	Yes	22%
4. Arness Fire Road – Tapo Canyon Road	4.73	3.60	1.13	0.51	1	Yes	Yes	19%
5. Black Canyon Road – Yosemite Avenue	4.01	0.23	3.79	2.09	1	No	Yes	19%
6. N. American Cutoff Road – Santa Susana Pass	3.60	2.13	1.47	1.25	0	Yes	Yes	18%
7a. Woolsey Canyon Road – Plummer Street	7.53	0.23	7.30	3.29	0	No	No	14%
7b. Woolsey Canyon Road – Roscoe Blvd	10.29	0.23	10.06	6.15	1	No	No	14%
8a. Bell Canyon Rd East – via Stagecoach Road	8.77	2.46	6.31	3.91	3	Yes	No	15%
8b. Bell Canyon Rd West – via Saddlebow Road	11.09	4.78	4.04	2.00	3	Yes	No	18%
9. Edison Corridor	3.29	3.29	0.00	0.00	0	Yes	Yes	20%
10. Western Conveyor Route	NA	NA	NA	0.00	0	Yes	NA	NA
11. Eastern Conveyor Route	NA	NA	NA	0.36	0	Yes	NA	NA

NA = Not Applicable

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2.1.1 Truck Routes

Potential truck hauling routes were considered in this analysis that could provide for three potential transport scenarios:

- Truck hauling from the SSFL site directly to permitted landfills via public roadways.
- Truck hauling from the SSFL site directly to permitted landfills using a newly improved private roadway on the north side of the SSFL site to access public roadways.
- Transport by conveyor from the SSFL site directly to a truck transfer site, for subsequent hauling by truck to landfills via public roadways.

Transport by truck is the most readily available option, and the simplest to implement. Currently, the only possibility for truck transport is Woolsey Canyon Road, the only existing paved public roadway providing access to the project site. There are also existing dirt roads between the site and the railway and highway that could potentially be improved for use as a truck haul route, and there are commercially available truck haulers operating in the region and the highway corridor.

No special equipment would be necessary for the trucks themselves, although they would be covered to prevent dust emissions during travel.

The existing dirt access/fire roads in the hillsides adjacent to the SSFL site are steep and narrow, in some places have inaccessible turns for larger vehicles, but could be improved to allow for efficient truck hauling operations. Paving the roadways would be necessary to reduce long-term erosion and allow for use during all weather conditions. The paved truck route, if built for materials conveyance, would need to be maintained over the course of operations. At the end of operations, the pavement and roadbed would be removed and the route would be restored to previous conditions.

The following figures illustrate the conveyance routes—truck haul routes, traditional conveyor routes, and aerial conveyor routes—considered in the initial analysis, the smaller set of routes considered in the updated effort, and the final set of routes considered for detailed analysis within this report:

- **Figure 3** shows the potential transport routes considered in the initial analysis effort.
- **Figure 4** shows the routes considered for detailed evaluation in this report, including the extents of the Woolsey Canyon Road route.

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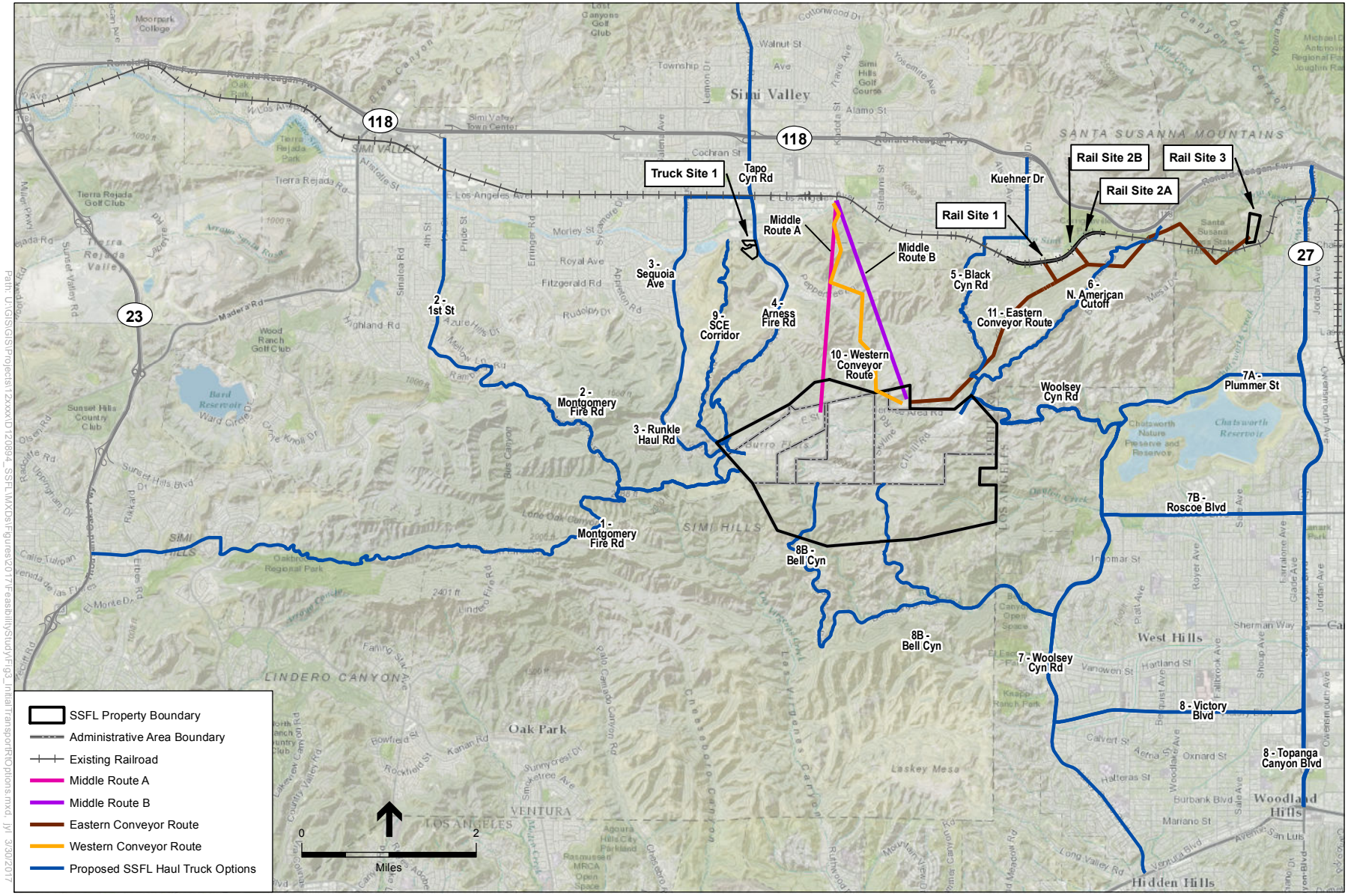
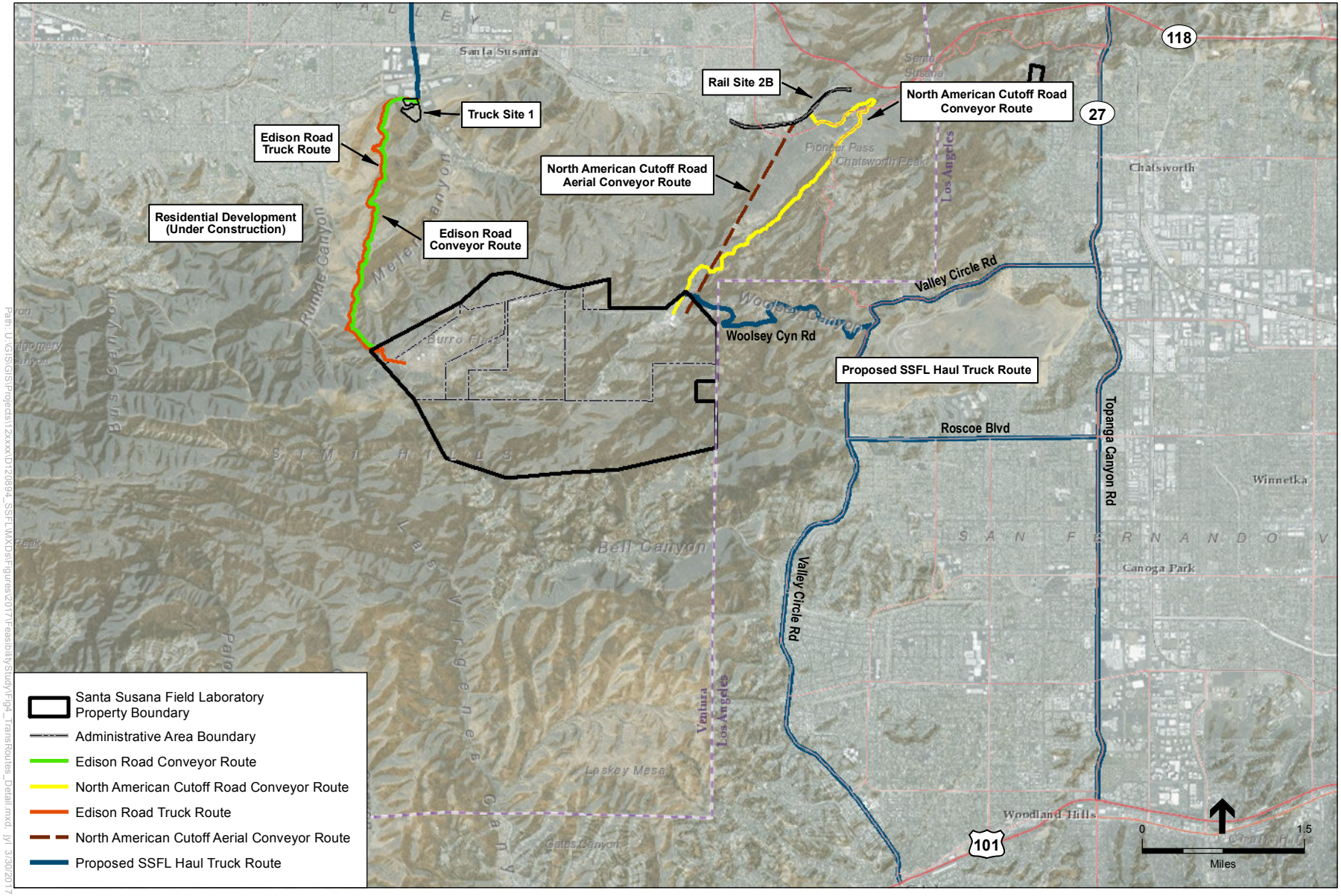


SOURCE: ESRI; ESA; KOA

Santa Susana Field Laboratory . 120894

Figure 3

Initial Transport Route Options



SOURCE: ESRI; ESA; KOA

Santa Susana Field Laboratory . 120894

Figure 4

Transport Routes Retained for Detailed Analysis

2.1.1.1 Montgomery Fire Road Truck Routes (#1, #2)

Compared to the other routes considered, the Montgomery Fire Road #1 route would have the longest length of new roadway over currently unpaved access roads and public/private lands. The length of Montgomery Fire Road #1 between SSFL and public roadways would be 6.7 miles, which is nearly double the length of the two routes that were ultimately chosen (Edison Road and North American Cutoff Road are 3.29 miles and 3.60 miles long, respectively). The increased length of the unpaved portion of this route would result in increased construction costs, as well as increased potential for impacts to biological and cultural resources during construction of the road. The point at which Montgomery Fire Road #1 would access public roadways is a residential neighborhood, which would increase the potential for emissions and noise impacts to occur within a residential neighborhood.

Montgomery Fire Road #2 would access the public roadway network in a densely populated residential neighborhood which would require haul trucks to travel through local residential streets[7] for approximately one mile before accessing 1st Street, a 4-lane collector road. Also, these routes would not connect to any rail transfer sites. Therefore, these routes were eliminated from further analysis.

2.1.1.2 Runkle Haul Road Truck Route (#3)

This corridor would be constructed adjacent to and through a new residential neighborhood. The outlet of the route at its northern connection to the public roadway network would be within a residential area on Sequoia Avenue. This route would result in the most miles traveled on local 2-lane residential streets. The presence of existing and future residential uses directly adjacent to the route made this route less preferred than others due to the potential impacts related to air quality, noise, and traffic. This route was therefore eliminated from further analysis.

2.1.1.3 Arness Fire Road Truck Route (#4)

This route would have a northern connection with public roadways on Pepper Tree Lane, adjacent to an active youth camp. The overall route would parallel the youth camp and would exit onto Peppertree Lane, a local roadway that provides access to the youth camp. This route was eliminated from further analysis because of its direct proximity to the youth camp.

2.1.1.4 Black Canyon Road Truck Route (#5)

This corridor, located primarily on public roadways, would offer a fairly direct route to SR 118 access points to the north of the SSFL site. Black Canyon Road, however, is a very curvy road through mountainous, hilly terrain, and long-term truck movements over this roadway would not be feasible. This route was therefore eliminated from further analysis.

[7] A local street is a roadway that provides access for pedestrians and vehicles to abutting properties, but is not intended for through traffic.

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2.1.1.5 North American Cutoff Road Truck Route (#6)

This truck haul route would provide access to the public roadway network at its northern terminus at Box Canyon Road, to the north of Santa Susana Pass Road. Based on the curvilinear and narrow configuration of Box Canyon Road between the North American Cutoff Road terminus and Santa Susana Pass Road, trucks would likely need escort vehicles and/or flag persons to complete the route to SR 118, which would disrupt existing public traffic operations for the 15-year duration of SSFL remediation activities. The narrow configuration of the Box Canyon Road segment makes the route infeasible for a long-term trucking operation. This route was therefore eliminated from further analysis as a haul truck route. However, it is included for detailed analysis as a conveyor route, as explained in more detail in Section 2.1.2 and Section 2.2.

2.1.1.6 Woolsey Canyon Road (via Plummer or Roscoe) (#7A & #7B)

These routes are comprised of existing collector roads or considered feasible and have been included as part of the proposed truck haul route being evaluated in the PEIR being prepared for the overall site cleanup of SSFL. This route also has the capability to be used as a transportation route for imported backfill.

2.1.1.7 Bell Canyon Road Truck Routes (#8A & #8B)

These routes would provide access from the south side of the SSFL site, and would provide connections to Valley Circle Boulevard and/or Topanga Canyon Boulevard, with subsequent connections to US 101 or SR 118. A sizeable proportion of the route between the SSFL site and major public roadways would be via a private, gated neighborhood along local streets. Long-term truck hauling would not be feasible via this route. This route was therefore eliminated from further analysis.

2.1.1.8 Edison Road Corridor (#9)

This route would be located along Edison Road, an existing, privately owned road that is operated by Southern California Edison (SCE) via an easement. This route was selected for further analysis because it provides relatively direct access from the SSFL site to a viable transfer site (Truck Site 1 is located at the northern terminus of this route), it is not directly adjacent to any residential or sensitive land uses, and the slopes along the corridor provide for a more feasible construction scenario compared to other routes. This route also has the capability to be used as a transportation route for imported backfill.

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2.1.2 Conveyor Routes

Potential conveyor routes were considered in this analysis that could provide for two potential transport scenarios:

- Hauling by conveyor system to a truck transfer site, for subsequent hauling by truck to landfills via public roadways.
- Hauling by conveyor to a nearby rail transfer site, for subsequent hauling by rail to landfills.[8]

As transport by rail is more efficient and less costly than by truck, a final determination of the most economical means of transport from the highway/rail corridor at SSFL to the final disposal site is highly dependent on the distance travelled. For one-way distances of 200 miles or less, direct transport by truck is likely the most economical approach. However, for longer distances, transport by rail would likely be more economical. Transport by rail opens up the opportunity to transport for very long distances to remote disposal sites.

2.1.2.1 Overland Conveyance

Overland conveyors are typically used in quarry and mining operations for the transportation of large quantities of materials (millions of CY). For large operations and/or shorter distances, conveyor systems are more economical to operate than trucks, as they have a higher initial capital outlay than a haul road, but lower operating costs.

Compared to trucks, overland conveyors create less noise and less air emissions as well, and can even generate electricity when transporting material downhill. The initial engineering and installation cost increases with rough terrain due to the required multiple changes in direction and elevation and numerous continuous supporting trusses.

Overland conveyors (belt systems with individual segments with drop locations between segments) require continuous maintenance for belt and motor repairs and replacements, and monitoring/maintenance of transfer points. Conventional conveyor technology was therefore eliminated from further consideration because a pipe conveyor can more efficiently deliver materials through the terrain and distances considered in this analysis.

In the material loading area, the pipe conveyor belt is open and is loaded in a similar fashion to a conventional conveyor belt. After loading, a special idler arrangement forces the flat belt to be rolled up and closed into a conveyor pipe that then carries the material (see **Figure 5**).

[8] Many of the disposal facilities being considered for use for this project do not have direct rail access. Additional transport from a rail to truck transport facility to the final destination was considered infeasible.

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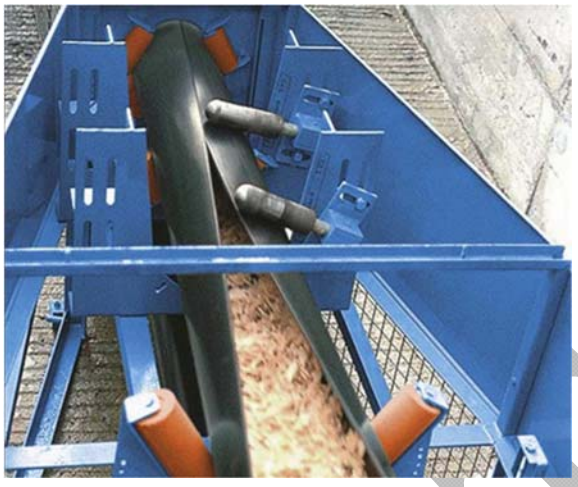

Figure 5
Pipe Conveyor Material Loading

At the discharge point, the belt reopens to discharge the material. After discharge, the return belt automatically closes again to form a closed pipe. The belt's ability to open and close could allow simultaneous material transport in the conveyor's upper run and its lower return belt run.

The pipe belt is flexible, which allows for directional changes without requiring transfer stations (see **Figure 6**). It can follow natural and manmade routes such as hills, rivers, bridges, roads, etc. Routing can be at grade, on bends, or with horizontal, vertical, or even three-dimensional curves. In addition, as much as 40 percent of the belt pipe would be mounted on concrete sleepers resting on the ground surface. Depending on the routing and belt size, the pipe conveyor typically has electric drive motors at the tail as well as head pulleys. All drive motors are frequency controlled to achieve different handling speeds.

This type of conveyor has the ability to convey material in both directions, either concurrently or sequentially. This means, the potential exists for this system to convey contaminated soil from SSFL to a transfer site and convey clean backfill from the transfer site to SSFL concurrently. This type of operation would require a cleaning system with washing and drying occurring as a continuous process without the need to stop the system to change from one material to another.

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Figure 6
Overland Conveyor System Showing Directional Changes

Elevation profiles were created from existing topographical maps. Thus, the profiles are approximate, but for purposes of this analysis, this level of accuracy is acceptable for estimating the technological feasibility and types of environmental effects that may occur from this technology. During design more detailed site specific surveys would be required.

Abiding by the premise that following existing roadways and keeping the conveyor length as short as possible would minimize total installation costs and adverse environmental effects, three potential pipe conveyor route corridors were identified: Black Canyon Road, Edison Road, and North American Cutoff Road.

When soil removal cleanup activities are complete and the pipe conveyor is no longer needed for operations, the conveyor system would be decommissioned.

Black Canyon Road Conveyor Route

The Black Canyon Road route (see Figure 3) is feasible for development of an overland conveyor primarily along the existing road; however, this route option was eliminated because it would discharge into a residential neighborhood with no clear ROW to a rail transfer site.

North American Cutoff Road Conveyor Route

This route would be located along North American Cutoff Road (see, an existing privately owned road located near the northeast portion of the SSFL site. This conveyor route was retained for detailed analysis because it follows a nearly continuous existing roadway from the loading point to the preferred loadout sites, it avoids major industrial and residential areas, and the slope of the corridor is within pipe conveyor capabilities. The routes identified along North American Cutoff Road for the overland conveyor and aerial conveyor technologies differ based on the topographical and road radius design limitations specific to each technology; specifically, the aerial conveyor requires a linear alignment.

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Edison Road Conveyor Route

This route would be located along Edison Road (see Figure 3), an existing privately owned road that is operated by SCE via an easement. This route was selected for further analysis for use as an overland conveyor route for the following reasons:

- The route provides relatively direct access from SSFL to a viable transfer site (Truck Site 1 is located at the northern terminus of this route).
- A conveyor route in this corridor can be constructed to roughly follow the existing Edison Road, providing access to the route for construction and maintenance.
- The slopes along the corridor provide for a more feasible construction scenario, as compared to other conveyor routes envisioned in the initial feasibility analysis.
- There are no adjacent residential developments or uses along private portion of the route.

2.1.2.2 Aerial Conveyance

An aerial conveyor system (also termed "cableway," and more commonly thought of as an "aerial tramway" system) is an aerial option to a ground-mounted overland conveyor system. Aerial conveyors, being supported by widely spaced pylons, would have a decreased aboveground footprint compared to overland conveyors. However, more land disturbance would occur with this technology compared to an overland conveyor system, because the support towers would require excavated and concrete-poured footings. Aerial conveyors can transport loose soil or containerized loads directly to a highway/rail corridor, with very little noise over the conveyor route. They require minimal maintenance and, after construction, little disturbance of the natural areas along the transportation corridor.

A primarily downhill route would allow the system to operate with a minimal amount of electrical power. With containerized transport, no spillage or wind-borne dust would be generated. However, aerial conveyor systems have the highest initial capital cost of all of the potential optional routes.

As this technology was being considered during the screening process that occurred after the August 2014 public meeting, three potential aerial conveyor route corridors were identified: Middle Route A, Middle Route B, and North American Cutoff Road; these corridors are described below and shown in Figure 3. Edison Road was not considered compatible with the aerial conveyor technology because of the location and orientation of the road relative to SSFL and Truck Site 1. The aerial conveyor technology requires a linear alignment —a clear linear path from SSFL to Truck Site 1 along Edison Road is not available.

This type of conveyor has the ability to convey material in both directions, either concurrently or sequentially. This means, the potential exists for this system to convey contaminated soil from SSFL to a transfer site and convey clean backfill from the transfer site to SSFL concurrently. This type of operation would either require a cleaning system or a separate set of transport containers used for the aerial conveyor system.

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When soil removal cleanup activities are complete and the aerial conveyor is no longer needed for operation, the conveyor system would be decommissioned.

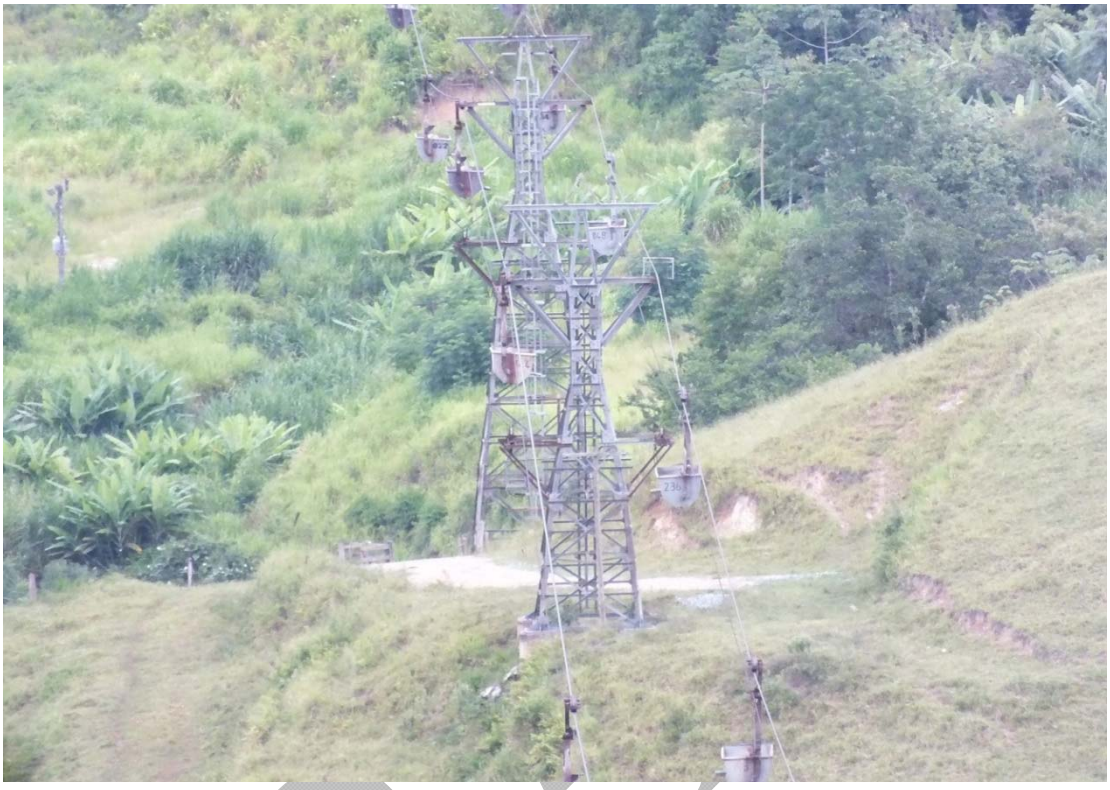

Figure 7
Aerial Conveyor System

Middle Routes A and B

Middle Routes A and B (as shown in Figure 3) were originally identified in a previous report (NASA, 2013) and would be located on previously undisturbed land (i.e., the routes would not follow an existing ROW). A review of the topographic profile of the routes determined that Middle Route A is suitable for construction of an aerial conveyor. However, these routes were eliminated from further consideration because they would not reach the preferred rail site and they consist of undisturbed land, which would result in greater potential for adverse effects on biological and cultural resources compared to other routes that have been previously disturbed. Middle Route B was also eliminated from further consideration, because the rise and slope angle of some sections of the route are higher than the maximum allowed for the transported material. These two routes were not analyzed in further detail for this report.

North American Cutoff Road

This route would be located along North American Cutoff Road, an existing privately owned road located near the northeast portion of the SSFL site. This route was identified as the best route for an aerial conveyor because of the regular, gradual slope of the route. The routes identified along

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North American Cutoff Road for the overland conveyor and aerial conveyor technologies differ based on the topographical and road radius design limitations specific to each technology. The overland conveyor route would follow North American Cutoff Road to Box Canyon Road to Santa Susana Pass Road. The aerial conveyor, which requires a linear alignment, would follow North American Cutoff Road for approximately 2,000 feet and then would deviate from the roadway alignment through undisturbed land for approximately 8,000 feet to Rail Site 2B as shown in Figure 4.

When soil cleanup activities are complete and the aerial conveyor is no longer needed for operation, the conveyor system would be decommissioned.

2.1.3 Transfer Sites

Four potential transfer sites (one truck transfer site and three rail transfer sites) were considered for evaluation: Truck Site 1, Rail Site 1, Rail Site 2A, and Rail Site 2B (see Figure 3). Truck Site 1 was selected for analysis after Edison Road was identified as a potential conveyor route.

Only Rail Site 2B is evaluated further in this analysis. Other potential rail sites identified in a previous report (NASA, 2013) were considered as well, but were determined to be less desirable from an operational and site layout perspective or completely infeasible altogether in terms of either locational issues or lack of connectivity with a viable and direct conveyance route from the SSFL site.

The volume of material to be handled and the rate at which it would be generated is a key consideration. For this feasibility analysis, it has been assumed that a total volume of approximately1,685,000 bank CY of contaminated soil would need to be shipped by rail. As described previously in Section 1.5, this quantity of soil removal is based on the assumption that overall soil removal at SSFL would begin while the selected potential transportation option is being planned, permitted and constructed (it is estimated that approximately 822,000 bank CY would be hauled form the SSFL site via Woolsey Canyon Road during the approximately 45 months that the selected option would be developed). This material would arrive at the railcar loading site at a rate ranging between 413 CY per day and 1,027, CY per day. Material density is assumed to be approximately 1.5 tons per bank CY (i.e., density of the soil in-place, prior to excavation) for calculation purposes. In the case of soil, railcars would likely reach their maximum weight capacity before they reach the maximum volumetric capacity, so the expanded volume of loose soil (as opposed to the bank condition) is not expected to affect railcar capacity. Once cleanup at the SSFL site is complete, the railcar loading infrastructure would be removed and the site restored to its original condition.

Soil would be excavated, loaded into trucks, transported a short distance onsite, and stock-piled at the conveyor feed point. The material would be conveyed from the stockpile to the truck or rail loading facility. At the truck or rail loading facility, soil would be deposited from the conveyor into a hopper that would directly load trucks or gondola rail cars, which would subsequently be covered with tarps or lids. The conveyor outlet would remain stationary, while gondola cars

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would be moved in groups of 5 to 10 cars by a railcar mover (of the type commonly found at industrial facilities) under the conveyor outlet.

The railcar loading area, specifically the location where the conveyor would discharge into the gondola cars, could be enclosed in a building or shed to prevent the escape of dust. There is flexibility in the design of the loading system; the loading shed could operate at negative pressure or with a wetting/misting system, ensuring no dust would escape during the loading process.

It would be possible for a hybrid configuration to be employed, in which a conveyor moves soil from SSFL to the rail loading site. At the loading site, the conveyor would deposit soil in shipping containers, which would then be loaded onto Articulated Bulk Container (ABC) railcars. This would increase the amount of handling for the soil, but offers flexibility because not all destination disposal sites are capable of receiving gondola cars. It would also increase capital costs by approximately $800,000.

2.1.3.1 Truck Site 1

Truck Site 1 (see **Figure 8**) would be constructed on a 4.7-acre portion of a 15-acre parcel. The site is relatively flat and vacant and is covered with grass. Several trees are located along a portion of the western boundary of the site that is being considered for use and in the southeastern portion of the site that is not being considered for use by the project. It is bounded on the north by a parking lot, on the east by Tapo Canyon Road, and on the south and west by open space. There are no structures on the site.

2.1.3.2 Rail Site 1

Rail Site 1 is a relatively flat, roughly rectangular site that is largely vacant. It is bounded on the west by Kuehner Drive, on the north by Smith Road, on the south by the railroad tracks, and on the east by an existing, privately owned warehouse property. Several small structures and mobile homes are onsite, so possible relocation of residents would be required.

It has been assumed that the entire vacant parcel at the corner of Kuehner Drive and Smith Road would be purchased for the project. This site is also closest to the residential neighborhood on the west side of Kuehner Drive, as well as residences on the south side of the tracks.

As shown in **Figure 9,** Rail Site 1 involves five short loading tracks. For a container and ABC car scenario, these tracks would be surrounded by pavement to allow truck and rubber-tired gantry (RTG) access along each track. If conveyor loading were used, the loading shed could be located near the turnout separating the loading tracks, or a separate track could be constructed specifically for the loading shed. If only gondola cars were used, with no need to accommodate trucks and RTGs, the tracks could be spaced more closely together. It may be possible to add sufficient tracks so an empty train could also be accommodated while a second train was being loaded, though this possibility has not been evaluated in detail.

From an operational perspective, Rail Site 1 offers the least flexibility and highest operating costs. It also requires a railcar mover to be located onsite in order to build trains ready for pick-up or to distribute empty cars onto the loading tracks.

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At Rail Site 1, there would be insufficient area for operations to allow for drop-off of an appreciable number of empty cars when loaded cars are onsite waiting departure. This suggests that an empty train would have to be dropped off one day, and UPRR would store the locomotives at its remote Van Nuys or Oxnard yards and then return several days later to pick up the loaded train. Alternately, an empty train would be stored in a UPRR yard until the loaded train was picked up and transported to the disposal site. At that time, there would be empty tracks available in which to place the empty cars (which would be brought from the UPRR yard by a second set of locomotives). Because of the extra switching, poor utilization of locomotives, and necessity to use tracks in UPRR's yard, having operations at Rail Site 1 would entail higher costs and less flexible operations of the sites evaluated.

Because of the additional logistics required for Rail Site 1, the processing rate of materials would be constrained due to complex scheduling of rail car movements. Therefore, this site was not considered for further analysis.

2.1.3.3 Rail Site 2A

Rail Site 2A, which is a long, linear site located along the south side of the railroad tracks (see Figure 3). This site is similar in configuration to Rail Site 2B and is located directly adjacent to Rail Site 2B on the south side of the railroad tracks depicted in **Figure 10**, along a hillside. This site was not considered for further analysis because development of Rail Site 2A for rail transfer activities would involve placing tracks along a large hillside, which would substantially increase development costs, largely due to the need for retaining walls. The additional cost of walls and associated excavation to provide space for the required siding (a low-speed track section distinct from a running line or through route such as a main line or branch line or spur) could add as much as $2 million to $10 million to the capital construction costs.

2.1.3.4 Rail Site 2B

Rail Site 2B is evaluated further in this analysis. This transfer site is a long, linear site on the north side of the railroad tracks, varying in width from approximately 40 feet to as much as 150 feet, extending from the Kuehner Drive overpass to approximately the entrance to Tunnel 26. It is bounded on the north by a private warehouse, a movie set location, and Corriganville Park. On the south it is bounded by the railroad tracks. The conceptual layout of Rail Site 2B is shown in **Figure 10**. Access to this site is from Smith Road, a local street that is lined with single family residences. Due to the size of this local roadway, proximity of residences (within 25 feet), and the size and configuration of this site, transport of clean backfill by truck to this site for conveyance to the SSFL site was considered infeasible for this site due to potential air quality, noise, and traffic impacts related to increased truck traffic on this local road.

2.1.4 Other Technologies Considered

Other conveyance technologies were considered for this analysis, and were evaluated in earlier analysis efforts based on carrying capacity, general applicability to terrain, distances, and surrounding land uses. Several potential methodologies and options were presented by attendees of the August 2014 public meetings. These options, as well as the reasons for deciding not to evaluate the potential options in greater detail in this analysis, are presented in **Table 2-3**.

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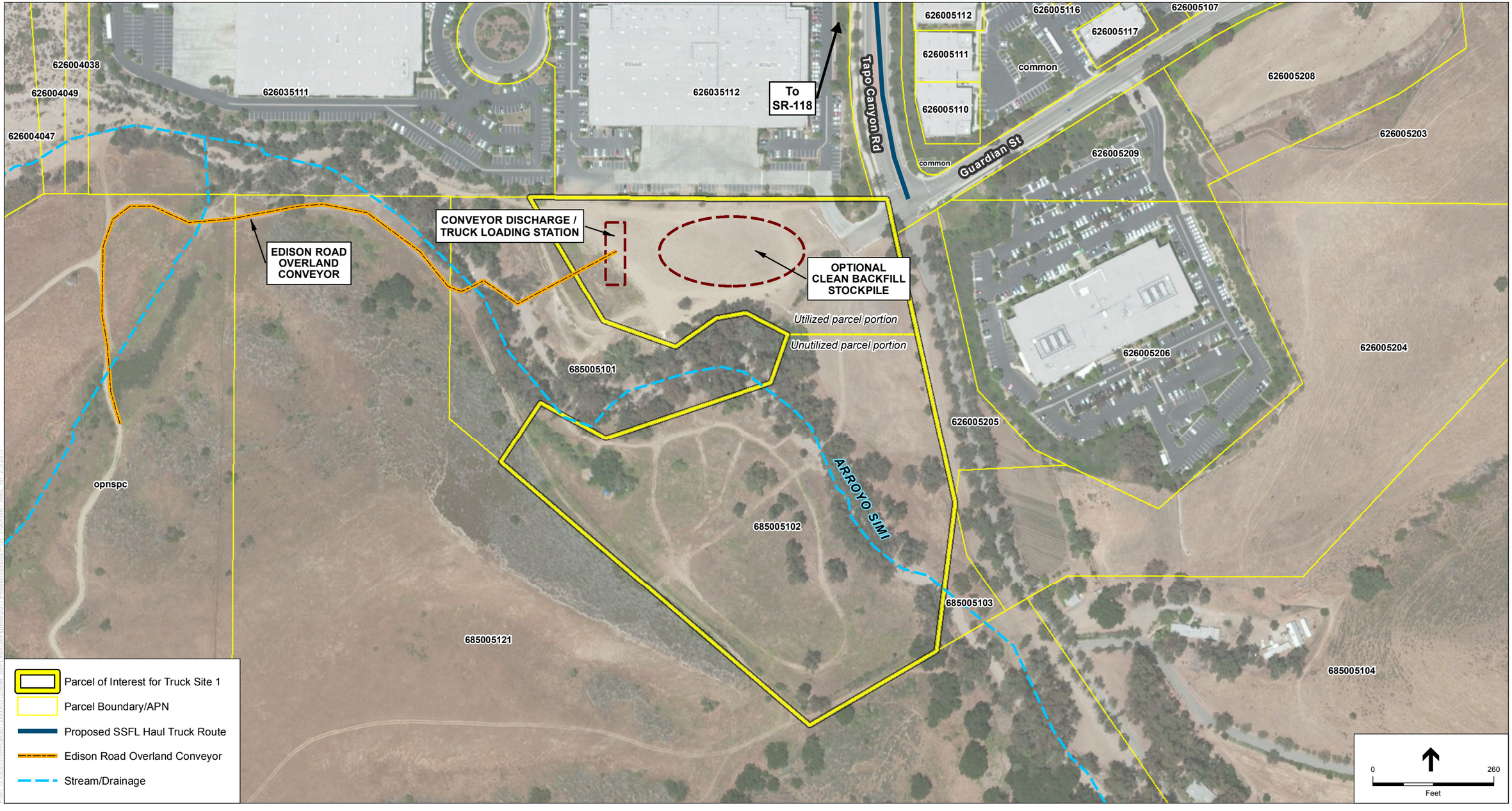

SOURCE: ESRI, ESA; USGS

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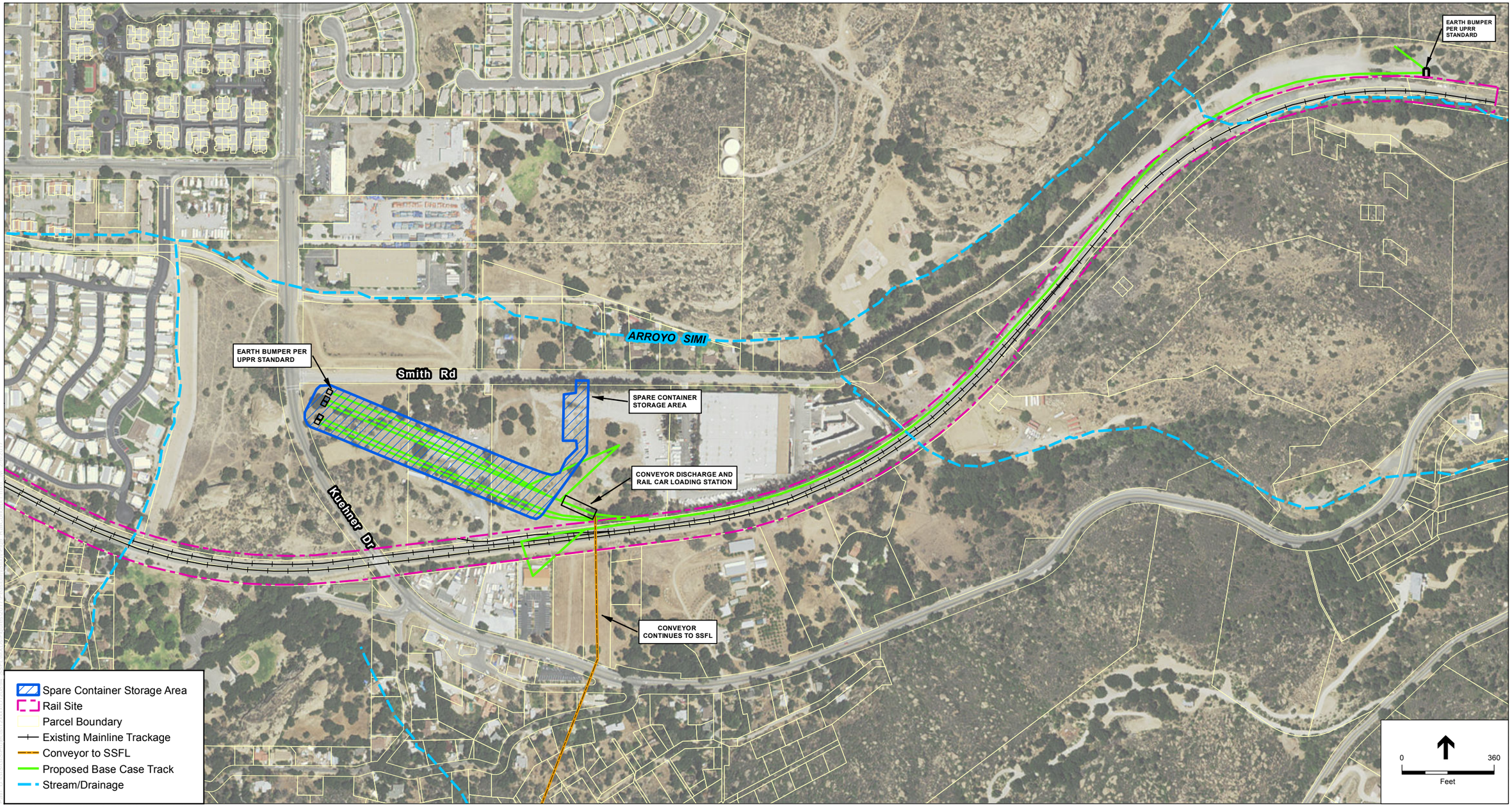
Figure 8

Truck Site 1



SOURCE: ESA; USGS; KOA 2015

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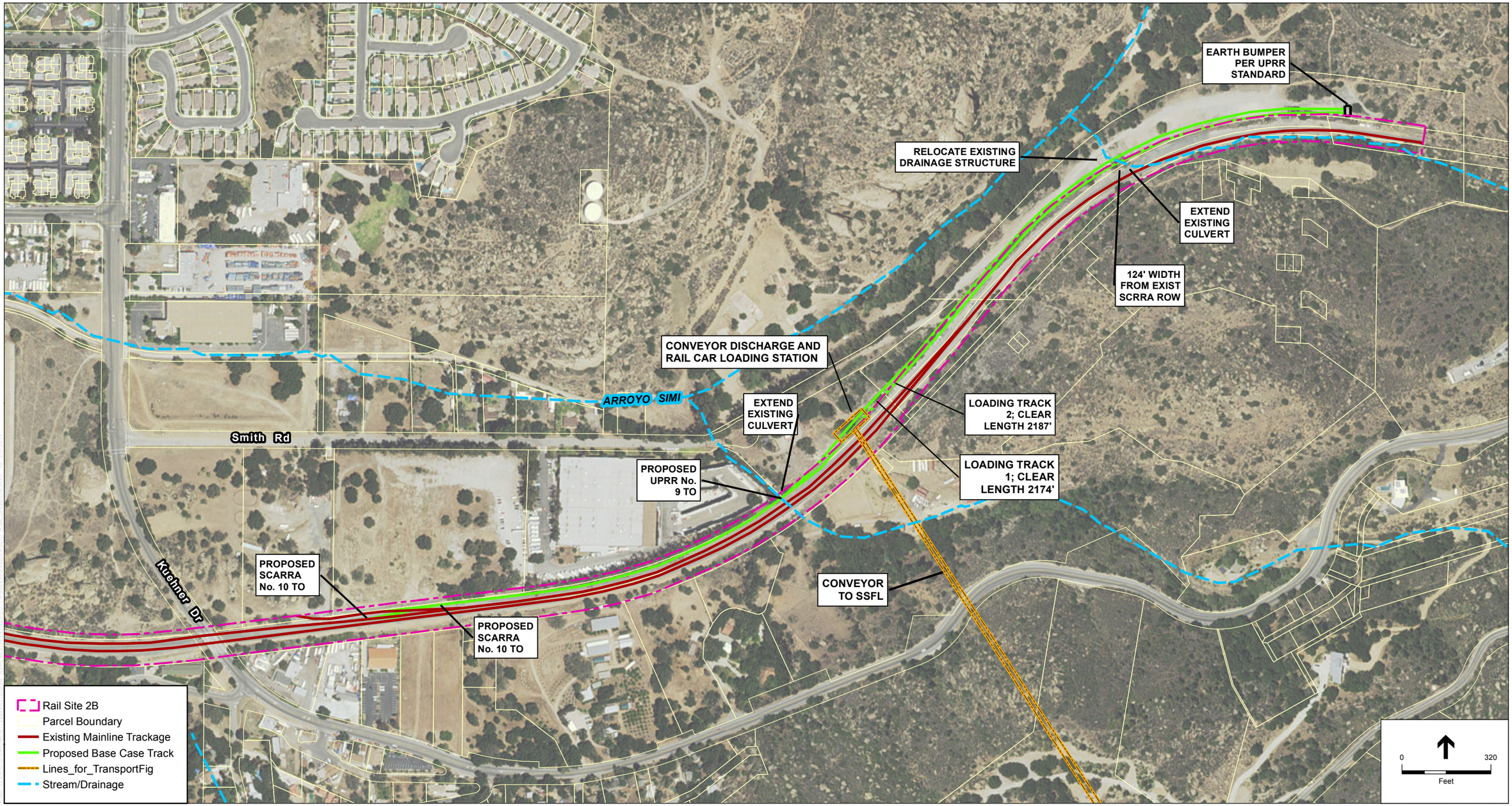
Figure 9

Rail Site 1 Conceptual Layout



SOURCE: ESA; USGS; KOA 2015

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Figure 10

Rail Site 2B Conceptual Layout

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TABLE 2-3
OTHER POTENTIAL OPTIONS CONSIDERED

Technology	Analysis
Bi-modal canister	This potential option would require truck traffic to travel along Woolsey Canyon Road and would not eliminate or reduce the number of trucks accessing local roadways and would not reduce local air emissions or traffic volumes in residential areas, thus this potential option was not considered.
Helicopter / Air Lift / Cargo Plane / Blimp	Not feasible due to general logistics of loading and offloading aircraft as well as cost of air travel.
Slurry pipe	Use of a slurry pipe was determined to be infeasible due to logistics of mixing contaminated soil with water and creating, managing and disposing of contaminated water.
Truck to rail	This potential option would require all truck traffic to travel along Woolsey Canyon Road (or a new road to be constructed on the north side of the SSFL site) and would not eliminate or reduce the number of trucks accessing local roadways and would not reduce local air emissions or traffic volumes in residential areas, thus this potential option was not considered.
Tunnel	Not feasible due to ground disturbance required to implement.
Conveyor to rail	Considered in this report.
Natural gas or non-diesel trucks	While alternative fuels and associated alternative-fueled equipment are available, such fuels and equipment are not feasible for implementation for this project. Natural gas is available in sufficient quantities, but the equipment available is currently limited to a few manufacturers or still in the prototype stage. Given the insufficient availability of natural gas fueled trucks for hauling SSFL materials to the appropriate receiver facilities, this alternative is not feasible for this project. In addition, electric engines were considered; however, due to the daily relocation of equipment throughout the SSFL site and the need for trucks to travel long distances away from the SSFL site, lack of charging stations in proximity to daily cleanup locations, and downtime for recharging, electric equipment was determined to not be feasible for this project.
Rail-Veyor	The Rail-Veyor technology was considered but screened-out of the analysis. A Rail-Veyor is a proprietary compact autonomous train system that operates on its own elevated track system. This technology would be constructed as a track system that curves and rises/falls with the local topography and materials would be carried on individual sets of cars as trains that use the rail system for propulsion and guidance. This technology is not considered to be feasible because of the need to establish curving track on significant vertical grades present in the vicinity of the SSFL site, and the limited capacity that could be provided due to the non-continuous flow operation (via single-trains running on single tracks) unlike what a conventional ground-based conveyor could provide.
Barges	Not feasible due to lack of access to waterways at or near the SSFL site.
Conveyor to truck	Considered in this report.
Existing spurs	Considered in this report.
Rail from project site	It would not be feasible to build a railway to a rail transfer facility on the SSFL site due to the significant vertical grades present in the vicinity of the site. In addition, this option would have limited capacity due to the non-continuous flow operation (via single-trains running on single tracks) unlike what a conventional ground-based conveyor could provide.
Sky-way or aerial tram	Considered in this report.
Truck and container option	As described below in more detail, this potential option is not considered for further analysis because it would require use of existing roadways to haul contaminated soil to Rail Site 2B and would not avoid adding vehicle traffic to local residential roads.
Super scooper	A super-scooper is an airplane that can load water into its payload area as it skims a water body for use in fighting wildfires. There are no known uses of this technology for soil transport.

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2.1.4.1 Truck and Container Option

If trucks are selected to move soil from SSFL to a rail loading site such as Rail Site 2B, soil would likely be loaded directly into open-top shipping containers mounted on truck chassis at the SSFL site. Covers would then be applied to the containers to prevent dust from escaping.

Trucks would then transport the containers the relatively short distance from the SSFL site to the rail loading site. Upon arrival at the rail loading site, the containers would be transferred to ABC railcars, a subset of a railcar type known as "articulated spine cars," using RTG cranes. Soil would remain inside the containers at all times. ABC railcars typically have a capacity of six loaded containers.

Containers would be 20 feet long, with an approximately 23-ton net capacity. Note that containers generally have a net capacity of approximately 32 tons, but the maximum gross weight of the trucks that move them between SSFL and the loading site would limit the load to approximately 23 tons. This equates to approximately 15 bank CY of soil per container. Empty railcars would remain parked on the loading tracks, while trucks carrying loaded containers would drive on a roadway next to the appropriate railcar. An overhead gantry crane would lift the container off the truck and place it on the railcar. Empty containers returning from the disposal site would be removed from the railcars in the same manner. The RTG cranes operate on asphalt or concrete runways, straddling the tracks and the adjacent truck roadways. These RTGs are commercially available from several manufacturers.

This potential option is not considered for further analysis because it would require use of existing roadways to haul contaminated soil to Rail Site 2B and would not avoid adding vehicle traffic and related air emissions to local residential roads. As discussed in Section 1.3 of this report, the purpose of this analysis is to identify feasible soil transport options that would reduce the potential impacts to traffic, noise, air quality, and safety related to increased truck traffic on Woolsey Canyon Road. Loading trucks to carry soil to a rail-transfer site via Woolsey Canyon Road would result in the same amount of truck trips as the proposed SSFL cleanup project and would not reduce any of these impacts.

2.2 Technical Evaluation

This section evaluates the technical, logistical, and practical feasibility of the Woolsey Canyon Road Truck Route and the four potential transportation options that remained after application of the screening process described in Section 2.1 of this report. An evaluation of the potential environmental constraints and potential adverse effects associated with each option is presented in Section 3.0.

The five options were evaluated for the following criteria:

- Required Land Acquisition or ROW
- Technological Feasibility
- Permitting Constraints

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- Implementation Schedule
- Construction Equipment and Workforce
- Cost

2.2.1 Woolsey Canyon Road Truck Route

Woolsey Canyon Road is the proposed truck route for the SSFL project which is evaluated in the PEIR. Haul trucks would travel to SR 118 or US 101 via the following roadways, shown in Figure 3 and Figure 4:

- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon to Valley Circle Boulevard to Lake Manor Drive to Valley Circle Boulevard to Plummer Avenue to Topanga Canyon Boulevard (SR 27) to SR 118
- Woolsey Canyon to Valley Circle Boulevard to US 101
- Woolsey Canyon to Valley Circle Boulevard to Roscoe Boulevard to Topanga Canyon Boulevard (SR 27) to US 101

2.2.1.1 Required Land Acquisition or Right-of-Way

The truck route via Woolsey Canyon Road to SR 118 or US 101 (shown as Routes #7A and #7B in Figure 3) would begin at the east gate of the SSFL facility and use public roadways via the roadways listed previously. Construction of new roadways or widening of existing roadways would not be necessary to establish use of these roadways for haul routes.

2.2.1.2 Technological Feasibility

Use of this route is technologically feasible, as the roadways currently exist and would not require any upgrades for use as a haul route.

2.2.1.3 Permitting Constraints

Long-term hauling along this route would require potential coordination with the City of Los Angeles and California Department of Transportation (Caltrans) for the occasional oversized load.

2.2.1.4 Implementation Schedule

No construction is necessary for this haul route; therefore, hauling activities could begin immediately upon DTSC approval of the SSFL PEIR and Program Management Plan, and acquisition of necessary permits and approvals to begin soil excavation activities. The schedule for implementation of this potential option is presented in **Table 2-4**.

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TABLE 2-4
WOOLSEY CANYON ROAD TRUCK ROUTE IMPLEMENTATION SCHEDULE

Task Name	Duration	Start	Finish
Certification of SSFL PEIR	1 day	December 2017	December 2017
Permitting/remedy decision documents	3 months	December 2017	February 2018
Operation	15 years	February 2018	November 2032

Note: The operational duration of 15 years is based on a range of 64 to 96 truck trips per day.

2.2.1.5 Construction/Decommissioning Equipment and Workforce

No construction is necessary for this haul route, so no additional equipment or workforce would be necessary. This haul route, which consists of a public roadway, would not be decommissioned upon completion of cleanup activities.

2.2.1.6 Cost

No capital costs would be incurred to use this as a trucking route, as no construction is required. As discussed in more detail in Section 4.0, the cost to transport soil by truck could be as much as $447 million[9] to transport contaminated soil from the site to disposal facilities and to transport clean backfill to the site over the approximate 15-year lifespan of the project. Local and State jurisdictions including the city of Simi Valley, the County of Los Angeles, the city of Los Angeles, and Caltrans, could require roadway maintenance payments. However, because the current pavement conditions and other details such as pavement thicknesses and roadway base depth are not known, the costs of maintenance that might be requested by jurisdictions are not known.

After the project is complete, Woolsey Canyon Road would not be decommissioned and would remain a useable public road.

2.2.2 Edison Road Truck Route

This potential option (shown as Route #9 in Figure 3) would be located along Edison Road, which is privately owned by multiple private owners and operated by SCE via an easement. This haul route would operate as a private road, with a controlled access point at the south end (at the SSFL site) and north end, where Edison Road would be extended to access Guardian Street. This route would not cross any public roadways before accessing Guardian Street.

[9] Operating costs include loading trucks with excavation spoils, driving trucks to disposal facilities, emptying trucks at disposal facilities, and transporting clean backfill to the site. Operating costs for truck operations were based on typical costs for truck operations, based on actual contracts for recent construction projects. The total cost was derived by multiplying the average round trip distance from SSFL to disposal facilities for each type of waste (240 miles for non-hazardous, 620 miles for hazardous, and 900 miles for radiologic waste) by the volume of each type of waste to be transported by $0.17/mile. It is assumed that clean backfill would be picked up on the return trip to SSFL from the disposal facility. See Appendix B for more details.

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This roadway would be an improvement of the existing Edison Road, an unpaved single-lane facility. Because of the need to provide a roadway that is adequate for truck-turning radii, and the need for two-lane segments in some areas, the analyzed centerline of the potential truck hauling road does not necessarily overlap with that of the existing Edison Road. Long box trailer, or double trailer, loads would not be feasible for travel on this potential truck haul route. Shorter box trailers, flatbeds, truck-rail container loads, and dump trailers would be more likely candidates. The conceptual engineering of this roadway considered that some portions, where feasible, would have two lanes of travel, and some areas would have single lanes of travel based on the topography.

It is assumed for this option that a total of up to 96 trucks per day would be split between Woolsey Canyon Road and the new Edison Road to transport contaminated soils from the SSFL site to disposal sites and to transport clean backfill to the site.

2.2.2.1 Required Land Acquisition or Right-of-Way

All of the land required for this truck haul roadway would be acquired via easements or purchase of land for construction of the road and use for truck hauling activities for the duration of the SSFL project. This route traverses 14 parcels that are owned by four or more private owners, including Runkle Canyon LLC (subsidiary of KB Homes) and the American Jewish University. SCE currently operates Edison Road via an easement with the private land holders. SCE uses the road for inspection and maintenance of an electrical transmission line that parallels the road. To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners. None of these parcels are currently for sale. The private land owners would need to be willing to sell or lease their parcels. Based on the current asking price of four other similar properties within 4 miles of the Edison Road Truck Route, it is estimated that the properties along the route would cost approximately $168,000 per acre to purchase. It is assumed that the highest asking price out of the four similar properties currently for sale would be the best cost estimate for the private land needed to construct the Edison Road Truck Route because the required lands are currently not for sale, which would allow the existing owners to request a premium on the estimated land value. Required negotiations with multiple land owners for long term easements would add a significant level of uncertainty to land acquisition. In addition, an access agreement with SCE would be necessary to operate and develop the road as a haul route. Copies of the real estate listings used to calculate this average are provided in Appendix A.

Total acreage assumed for implementing this truck haul corridor was based on conceptual engineering of the new roadway required to support long-term hauling by heavy-duty single-unit (non-articulated) trucks. As was calculated for the haul road cost estimates, a range of total disturbance was calculated, based on a one-lane road and a two-lane road, both graded and paved. For a 12-foot-wide roadway, the total disturbed area would be 84 acres. For a 24-foot-wide roadway, the total disturbed area would be 88 acres (the amount of disturbance is due to grading necessary to reconfigure the roadway and not the acreage of the roadway itself).

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2.2.2.2 Technological Feasibility

Improvement of this roadway is technologically feasible, but would require significant grading to provide a paved all-weather roadway usable by trucks without creating dangerous grade conditions or corners.

2.2.2.3 Permitting Constraints

Permits and other approvals required for implementation of the Edison Road Truck Route are anticipated to include, but are not limited to, those listed in **Table 2-5**, as well as potential coordination with the City of Simi Valley and California Department of Transportation (Caltrans) for the occasional oversized load. Required negotiations with such agencies/organizations would add a significant level of uncertainty to the ultimate approval of this truck route. Long-term hauling along this route would require potential coordination with the City of Los Angeles and California Department of Transportation (Caltrans) for the occasional oversized load.

TABLE 2-5
POTENTIAL PERMITS & APPROVALS FOR EDISON ROAD TRUCK ROUTE

Agency	Potentially Required Permit or Approval
Federal	
U.S. Army Corps of Engineers	• Clean Water Act Section 404 Permit for fill or discharge of dredged or fill material into waters of the United States
U.S. Fish and Wildlife Service	• Endangered Species Act Section 10 Incidental Take Permit for adverse effects on federally listed species • ESA Section 7 consultation and Biological Opinion
U.S. Department of Energy	• Supplemental National Environmental Policy Act (NEPA) Assessment
National Aeronautics and Space Administration	• Supplemental NEPA Assessment
State of California	
California Department of Toxic Substances Control	• Certification of PEIR
California Department of Fish and Wildlife	• Section 1602 Streambed Alteration Agreement for alteration of bed, bank, or channel (Waters of the State) • California Endangered Species Act Sections 2081(b) and (c) Incidental Take Permit for adverse effects on state listed species
California State Historic Preservation Officer	• Section 106 of the National Historic Preservation Act Consultation (by federal lead agency as applicable)
California State Water Resources Control Board	• National Pollution Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance.

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Agency	Potentially Required Permit or Approval
Regional/County	
Regional Water Quality Control Board	• Section 401 Water Quality Certification for streambed modifications • Waste Discharge Requirements
Ventura County Air Pollution Control District	• Rule 55 (Fugitive Dust) requirements during construction activities • Rule 74.29 Soil Decontamination Operations requirements • Authority to Construct, Permit to Operate
Ventura County Resources Management Agency, Environmental Health, Solid Waste Program	• Onsite Hazardous Waste Treatment/Tiered Permit by Rule • Waste disposal plans included in Corrective Action Implementation Work Plans
Ventura County, Resource Management Agency, Planning Division	• Tree Permit for removal, alteration, and/or construction within the Tree Protection Zone of protected trees • Zoning Clearances
Ventura County, Public Works Agency, Transportation Department	• Haul Route Plan, Construction Traffic Management Plan and/or Traffic Control Plan
Los Angeles County, Public Works Agency, Transportation Department	• Haul Route Plan, Construction Traffic Management Plan, and/or Traffic Control Plan
City of Los Angeles, Public Works, Department of Transportation	• Construction Work Site Traffic Control Plan • Haul Route Permit
Ventura County, Resource Management Agency, Watershed Protection District	• Watercourse Permit (as applicable to work performed in District jurisdictional channels)
Ventura County, Resource Management Agency, Division of Building and Safety	• Building and Grading Permits
Ventura County, Fire Protection Division	• Hazardous Materials Permit
City of Simi Valley	• Conditional Use Permit • Building and Grading Permits

2.2.2.4 Implementation Schedule

The schedule presented in **Table 2-6** shows that development of this potential option would take approximately 45 months to complete upon certification of the PEIR and approval of the SSFL project.

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TABLE 2-6
EDISON ROAD TRUCK ROUTE IMPLEMENTATION SCHEDULE

Task Name	Duration	Start	Finish
Certification of SSFL PEIR	1 day	December 2017	December 2017
Design	12 months	December 2017	November 2018
Environmental Review (CEQA/NEPA)	30 months	January 2018	May 2020
Land Acquisition	26 months	May 2018	May 2020
Permitting	4 months	June 2020	September 2020
Construction	12 months	September 2020	August 2021
Operation	11 years	August 2021	November 2032
Decommissioning	1 year	December 2032	November 2033

Notes: NA – Not Applicable
Several tasks could occur concurrently. For instance:

- Design could begin as soon as DTSC selects a potential option to implement.
- Environmental review includes background technical studies and surveys necessary to complete California Environmental Quality Act (CEQA) and NEPA) analyses.
- Land acquisition could begin as soon as DTSC selects a potential option to implement. NASA, DOE, and Boeing, who are the RPs for implementing the SSFL project, would need to demonstrate land control in their application to the County of Ventura for a Conditional Use Permit. Property acquisition would not be completed until the CEQA and NEPA documents prepared for the project are approved.
- The operational duration of 15 years is based on the rate at which soil would be excavated at the SSFL site.
- It is assumed that soil cleanup and offsite transport would continue via Woolsey Canyon while the Edison Road Truck Route is being planned, permitted and constructed.

2.2.2.5 Construction/Decommissioning Equipment and Workforce

Construction of this truck haul roadway is estimated to require the following construction equipment and employees:

- Four scrapers
- Four excavators
- Two bulldozers/backhoes
- Two motor graders
- One sheepsfoot compactor
- Ten dump trucks
- One set of paving equipment
- Four water trucks
- A crew of 36 workers (equipment operators, foreman/superintendent, grade checker, drivers, inspector construction manager)

2.2.2.6 Cost

The cost estimates developed for this potential option are based on initial conceptual engineering estimates for the technologies evaluated for this analysis. The final design of the roadway, if implemented, would determine the length and location of two-lane segments within the overall corridor.

As shown below in **Table 2-7** (see Appendix B for detailed development costs), the estimated total cost for development (planning, permitting, construction, and decommissioning) of this potential option is approximately $17 million.

TABLE 2-7
ESTIMATED COST TO DEVELOP EDISON ROAD TRUCK ROUTE

Item	Cost
Environmental Review (CEQA & NEPA)	$2,000,000
Land Purchase Price	$2,671,000
Road Construction*	$11,850,000
Permitting	$50,000
Decommissioning	$600,000
Total	**$17,171000**

See Appendix B for detailed development costs.

Operating costs based on per ton-mile transport costs were generally estimated based on the comparative basis of fuel costs, labor costs, equipment costs, tipping fees, and maintenance of the new road. It is estimated that operation (loading trucks with contaminated soil, transporting to of the Edison Road Truck Route would cost approximately $447 million (this cost includes $160 million for the first 45 months of operation using Woolsey Canyon Road while this alternative is developed, plus $287 million for 11 years of operating this alternative) .[10]

Edison Road is currently used by SCE as is for inspection and maintenance of its transmission line that is adjacent to the roadway. It is unknown at this time if land use agreements that would be negotiated with the land owner and SCE would require decommissioning of this roadway or not (the land owner and/or SCE might want to retain the paved roadway for access). Due to the uncertainty of potential future agreements with the land owner and SCE, this analysis assumes that the road would be decommissioned upon completion of the SSFL project.

2.2.3 Edison Road Overland Conveyor

This potential option consists of constructing an overland conveyor along Edison Road that would transport soil from the west side of the SSFL site to Truck Site 1. **Figure 11** shows the plan view of the conveyor route and cross-section of the terrain. The centerline of the route location may not always show the conveyor on the roadway. The intention is for the conveyor to follow the roadway as much as possible. The conveyor would not take over the road ROW or prohibit access. Edison Road would still be available to SCE for inspection and maintenance of its transmission line. The road would also be used as an access road for conveyor maintenance.

[10] Operating costs include loading trucks with excavation spoils, driving trucks to disposal facilities, emptying trucks at disposal facilities, and transporting clean backfill to the site. Operating costs for truck operations were based on wages and typical hourly costs for truck operations, based on actual contracts for recent construction projects. The total cost was derived by multiplying the average round trip distance from SSFL to disposal facilities for each type of waste (240 miles for non-hazardous, 620 miles for hazardous, and 900 miles for radiologic waste) by the tonnage of each type of waste to be transported by $0.17/mile. It is assumed that clean backfill would be picked up on the return trip to SSFL from the disposal facility. See Appendix B for more details.

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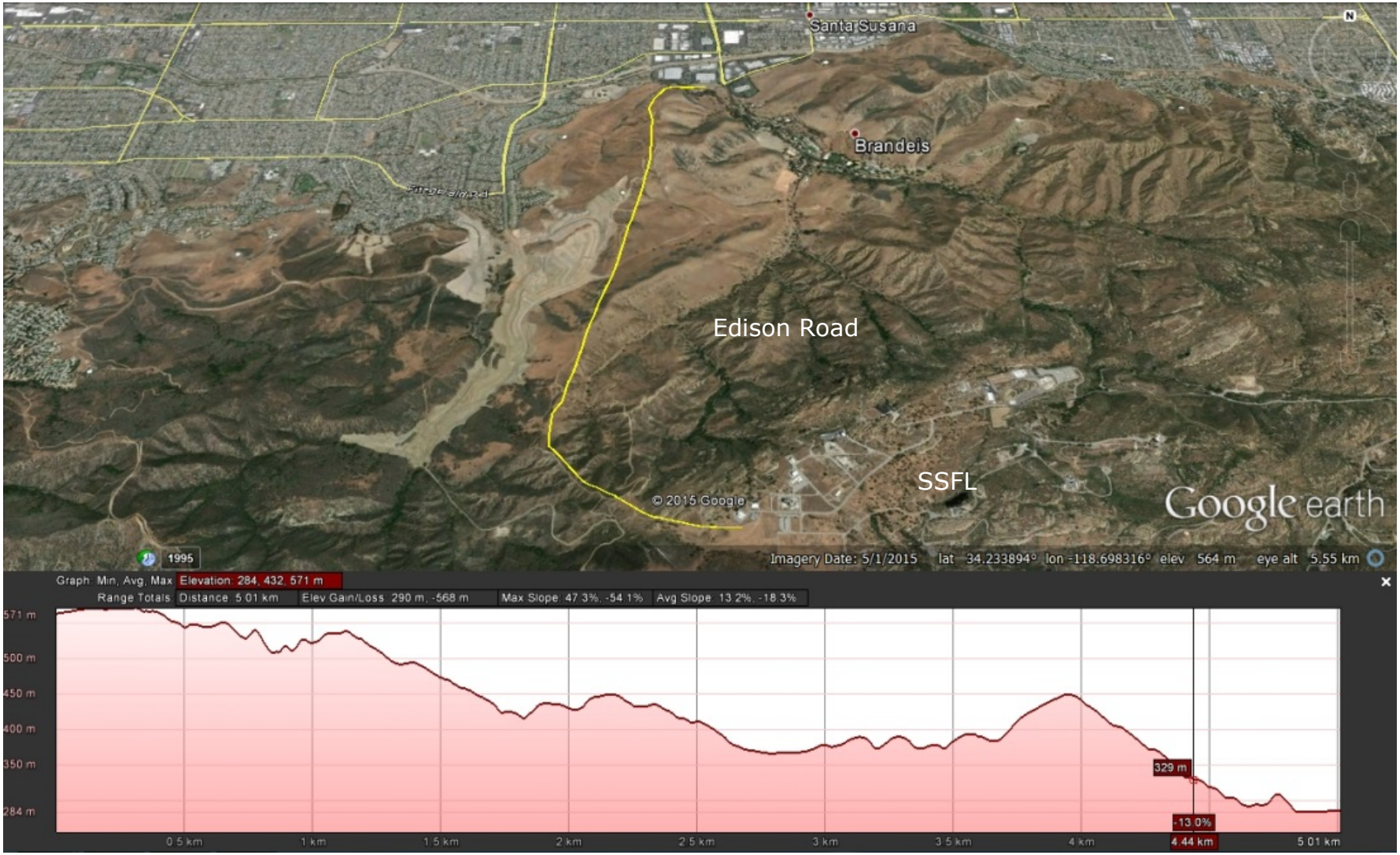

SOURCE: FL Smidth

Santa Susana Field Laboratory . 120894

Figure 11

Edison Road Plan View and Terrain Cross Section

As discussed in Section 2.1.2, this route was chosen for further detailed analysis because it provides relatively direct access from the SSFL site to a viable transfer site (Truck Site 1). A conveyor route in this corridor can be constructed to roughly follow the existing and disturbed ROW, providing access to the route for construction and maintenance, and the slopes along the corridor provide a more feasible construction scenario, compared to other conveyor routes considered.

This potential option would have the capability to convey clean backfill from Truck Site 1 to SSFL. This potential option would require an area of 0.8 acres for stockpiling clean fill (shown on Figure 8) as well as installation of a washing and drying system at the conveyor terminus at Truck Site 1. Installation of these features would increase the development cost of this option by approximately $11 million and the operational cost by approximately $8 million to account for handling the soil at Truck Site 1 and conveying it to SSFL instead of backfill being delivered by truck directly to the locations where fill is needed.

2.2.3.1 Required Land Acquisition or Right-of-Way

The conveyor system on this route would be 13,615 feet (2.58 miles) long, of which approximately 9,022 feet (1.7 miles) would be elevated and not on the road path. The pipe conveyor generally follows the existing road, although it would cross Edison Road approximately 20 times as a result of sharp corner radius and terrain constraints.

Standard elevated structure support spacing would be 80 feet, which would require approximately 114 support footings to be provided outside the road corridor. When the conveyor is located at ground level and on flat terrain, the panels would be directly mounted on concrete sleepers (supports) resting on the ground surface approximately every 8 feet. For elevated conveyor sections over road crossings, creeks, wildlife crossings, and other hazards, the panels would be mounted in fabricated trusses supported on pylons. Truss elements would be assembled on the ground to simplify installation and lifted into place.

Elevated sections provide a smooth conveying transition both horizontally and vertically between ground-mounted conveyor sections at a minimum required height. A standard elevated truss section includes a walkway on one side. It is conservatively estimated that approximately 60 to 75 percent of the conveyor's length would be composed of elevated sections. Although indeterminate until a site survey is completed, the amount of elevated structure would likely be substantially reduced in the final design when a more accurate road-following conveyor path can be defined.

The total disturbed land area for this conveyor system—assuming areas measuring 10 feet by 10 feet would be used for construction of footings—would be 11,400 square feet (0.02 acre). The final size of the footings would need to be determined from geotechnical data and depends upon factors such as load bearing capacity of the soil and seismic requirements.

All of the land required for this conveyor route (including the 4.7-acre Truck Site 1) would be acquired via easements or purchase of land for construction of the conveyor and use for soil conveyance and truck loading activities for the duration of the SSFL project. This route traverses

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14 parcels that are owned by four or more private owners, including Runkle Canyon LLC (subsidiary of KB Homes) and the American Jewish University. SCE currently operates Edison Road via an easement with the private land holder. SCE uses the road for inspection and maintenance of an electrical transmission line that parallels the road. An access agreement with SCE would also be necessary to operate and develop the road as a conveyor route. To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners. None of these parcels are currently for sale. The private land owners would need to be willing to sell or lease their parcels. Based on the current asking price of four other similar properties within 4 miles of the Edison Road Truck Route, it is estimated that the properties along the route would cost approximately $168,000 per acre to purchase. It is assumed that the highest asking price out of the four similar properties currently for sale would be the best cost estimate for the private land needed to construct the Edison Road Overland Conveyor Route because the required lands are currently not for sale, which would allow the existing owners to request a premium on the estimated land value. Required negotiations with multiple land owners for long term easements would add a significant level of uncertainty to land acquisition. Copies of the real estate listings used to calculate this average are provided in Appendix A.

2.2.3.2 Technological Feasibility

The conceptual design of the conveyor route for this corridor has shown the technology would be feasible. The conceptual design considered vertical grades along the route, but detailed topography files were not used and engineering was not taken beyond an equivalent of 5 percent of total design. Geotechnical issues were not investigated for this engineering effort. Final engineering designs based on acquired/flown aerial photography and topographic maps, and geologic and property studies, would need to be conducted prior to final design.

Truck Site 1 is large enough for heavy-duty trucks to turn around onsite. This was analyzed through a general engineering review of the site. The site would need to be paved, and a structure would need to be built onsite to transfer remediation materials from a conveyor system to each truck. To bring clean soil back to the SSFL site as needed, the structure would also need to allow for this type of operation.

2.2.3.3 Rail Logistics

This route would terminate at Truck Site 1, where the conveyed material would be transferred into haul trucks for direct transport to disposal facilities and would not involve any transport by rail.

2.2.3.4 Permitting Constraints

Implementation of this potential option is anticipated to require the same permits identified for the Edison Road Truck Route, as shown in Table 2-5. Required negotiations with such agencies/organizations would add a significant level of uncertainty to the ultimate project approval.

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2.2.3.5 Implementation Schedule

The schedule presented in **Table 2-8** shows development of this potential option would take approximately 48 months to complete upon certification of the PEIR for the SSFL project.

TABLE 2-8
EDISON ROAD OVERLAND CONVEYOR IMPLEMENTATION SCHEDULE

Task Name	Duration	Start	Finish
Certification of SSFL PEIR	1 day	December 2017	December 2017
Design	12 months	December 2017	November 2018
Environmental Review (CEQA/NEPA)	30 months	January 2018	May 2020
Land Acquisition	26 months	May 2018	May 2020
Permitting	4 months	June 2020	September 2020
Construction	15 months	September 2020	November 2021
Operation	11 years	November 2021	November 2032
Decommissioning	13 months	November 2032	November 2033

Notes: Several tasks could occur concurrently. For instance:

- Design could begin as soon as DTSC selects a potential option to implement.
- Environmental review includes background technical studies and surveys necessary to complete CEQA and NEPA analyses.
- Land acquisition could begin as soon as DTSC selects a potential option to implement. The RPs would need to demonstrate land control in their application to the County of Ventura for a Conditional Use Permit. Property acquisition would not be completed until the CEQA and NEPA documents prepared for the project are approved.
- The operational duration of 15 years is based on the rate at which soil would be excavated at the SSFL site and assumes that soil would be transported via Woolsey Canyon Road, while the Edison Road overland conveyor route is being planned, permitted and constructed.

2.2.3.6 Construction Equipment and Workforce

Construction of this conveyor route is estimated to require the following construction equipment and employees:

Conveyor

- Two mobile hydraulic cranes
- Two portable welders
- Four service trucks
- One front-end loader
- Two bulldozers
- One backhoe
- One grader
- A crew of 12 workers

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Truck Site 1

- Three front end loaders / backhoes
- Two graders
- Scraper
- Two excavators
- Twenty dump trucks (10 CY)
- Two sheepsfoot compactors
- Two roller compactors
- Curb and gutter cast machine
- Twenty pickup trucks
- Auger
- Truck mounted crane
- A crew of 30 workers

2.2.3.7 Cost

The cost estimates developed for this conveyor system included the elements of conveyor support and elevated truss sections, gravity belt take-up system, drive system, idlers, belt cleaners, conveyor infeed, discharge, controls, instruments, security, maintenance. The estimated costs to develop the Edison Road Overland Conveyor Route and Truck Site 1 are provided in **Table 2-9**.

TABLE 2-9
ESTIMATED COST TO DEVELOP EDISON ROAD OVERLAND CONVEYOR

Item	Cost
Environmental Review (CEQA & NEPA)	$2,000,000
Land Purchase Price	$3,696,000
Conveyor Construction	$56,052,000
Truck Site Construction	$5,894,000
Permitting	$50,000
Decommissioning	$12,389,000
Total	**$80,085,000**

Construction costs are estimated at +50/-30 percent.
See Appendix B for detailed development costs.

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The operating cost for this potential option is estimated on the basis of cost of power, operator and maintenance labor, repair parts, truck transport to landfills, tipping fees, and transport of backfill. It is estimated that the total operational cost of this potential option for the life of the project would be $464 million (this cost includes $160 million for the first 45 months of operation using Woolsey Canyon Road while this alternative is developed, plus $304 million for 11 years of operating this alternative)[11].

When soil removal cleanup activities are complete and the overland conveyor is no longer needed for operations, the conveyor system would be decommissioned.

2.2.4 North American Cutoff Road Overland Conveyor

This route was chosen for further evaluation for the following reasons:

- The corridor has a northern terminus at Rail Site 2B (see Figure 4).
- Nearly continuous existing roadway from the loading point to loadout site, reducing the amount of required corridor civil works and elevated conveyor sections.
- Relatively short conveying distance.
- Avoids major industrial and residential areas.
- Corridor vertical inclinations are within pipe conveyor capabilities.

An initial 165-foot length of conveyor would be required for material loading and to fully enclose the pipe at the tail end of the conveyor. Once enclosed, the pipe conveyor route follows along the western side of Facility Road until it reaches the intersection of Black Canyon Road and North American Cutoff Road. The conveyor would cross over Black Canyon Road on an elevated structure and then continues along the northern side of North American Cutoff Road.

Figure 12 shows the plan view of the conveyor route and cross section of the terrain. The centerline of the route does not exactly follow the road ROW, but the conveyor would follow the roadway as much as possible.

The pipe conveyor route leaves the road grade in two more sections where the road curve radius is greater than the design radius of the pipe conveyor. Elevated structures would be used to cross two smaller ravines prior to reaching the upper grade section.

[11] Operating costs include loading trucks with excavation spoils, transporting soil to conveyor loading area, loading the conveyor, loading trucks for transport to disposal facilities, driving trucks to disposal facilities, emptying trucks at disposal facilities, and transporting clean backfill to the site. Operating costs for truck operations were based on wages and typical hourly costs for truck operations, based on actual contracts for recent construction projects. The total cost was derived by multiplying the average round trip distance from SSFL to disposal facilities for each type of waste (240 miles for non-hazardous, 620 miles for hazardous, and 900 miles for radiologic waste) by the volume of each type of waste to be transported by $0.17/mile. Costs for maintaining the roadway for 11 years (approximately $577,000) were included in the development cost estimate. See Appendix B for more details.

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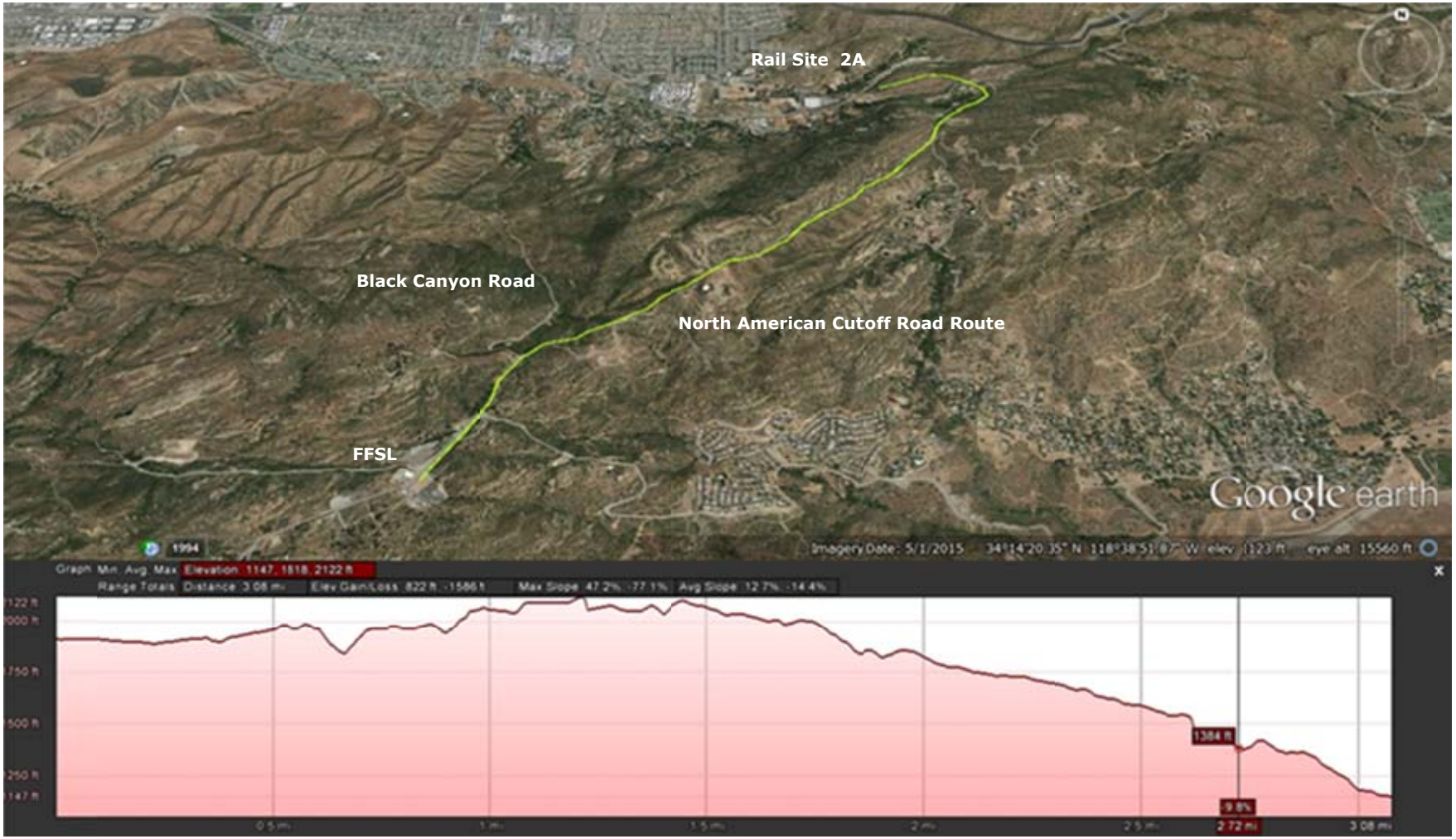

SOURCE: FL Smidth

Santa Susana Field Laboratory . 120894

Figure 12
North American Cutoff Road Plan View
and Terrain Cross Section

Once the upper elevation section is reached, the pipe conveyor crosses over North American Cutoff Road and primarily continues along the south side of the road. Whenever the conveyor route must leave the road grade, the conveyor is supported on elevated structures.

The final section of the road continues along the south side of North American Cutoff Road until the paved Box Canyon Road is reached. The conveyor crosses over the North American Cutoff Road, a private road, and the Santa Susana Pass Road, all on elevated structures. Once across Santa Susana Pass Road, the conveyor declines rapidly across previously undisturbed land and terminates at Rail Site 2B.

2.2.4.1 Required Land Acquisition or Right-of-Way

Conveyor Route

The conveyor system on this route would be 16,372 feet (3.10 miles) long, of which approximately 9,823 feet (1.86 miles) would be elevated (from 1 to 10 feet off the ground and 20 feet over road crossings) and not on the road path. The pipe conveyor generally follows the existing road, although it crosses the road in some locations because of sharp corner radius and terrain constraints.

Standard elevated structure support spacing is 80 feet, which would require approximately 204 support footings to be provided outside of the road corridor. The total disturbed land area for this conveyor system—assuming 10-foot by 10-foot areas would be used for construction of footings—would be 20,400 square feet. The size of the footings would need to be determined from geotechnical data and depends upon such things as load bearing capacity of the soil and seismic requirements.

This conveyor route traverses 13 parcels that are either owned by private owners or administered by local government entities, including Ventura County, Rancho Simi Recreation and Parks District, and the Mountains Recreation and Conservation Authority. To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners and government land administrators. These parcels are currently not for sale. The land owners/administrators would need to be willing to sell or lease their parcels. Based on the current asking price of four other similar properties within 1 mile of this route, it is estimated that the properties along the route would cost approximately $168,000 per acre to purchase. It is assumed that the highest asking price out of the four similar properties currently for sale would be the best cost estimate for the private land needed to construct the North American Cutoff Road Overland Conveyor because the required lands are currently not for sale, which would allow the existing owners to request a premium on the estimated land value. Required negotiations with multiple land owners for long term easements adds a significant level of uncertainty to land acquisition. Copies of the real estate listings used to calculate this average are provided in Appendix A.

Rail Site 2B

The land area for the rail transfer site and the related new rail siding length and width would total 11.9 acres. A proportion of the site would entail the purchase of private land, and the remainder would require lease or purchase of railroad ROW.

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This rail site occupies seven parcels that are owned by unnamed private land owner(s). To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners. None of these parcels are currently for sale. The private land owners would need to be willing to sell their parcels, should the RPs seek to purchase the land. Based on the current asking price of four other similar properties within 1 mile of this rail site, it is estimated that the properties along the route would cost $168,000 per acre to purchase. Copies of the real estate listings used to calculate this average are provided in Appendix A.

2.2.4.2 Technological Feasibility

Conveyor Route

The conceptual design of the conveyor route for this corridor shows the technology would be feasible. The conceptual design considered vertical grades along the route, but detailed topography files were not used and engineering was not taken beyond an equivalent of 5 percent of total design. Geotechnical issues were not investigated for this engineering effort. Final engineering designs based on site-specific survey and topographic maps, and geologic and property studies, would need to be conducted prior to final design.

Rail Site 2B

Based on the track configuration suggested at the rail loading site, the maximum train length would be approximately 3,900 feet. At either site, the controlling length is the distance between the turnout that connects the loading tracks to the existing SCRRA siding and the end of the track, near the tunnel (at Site 2B, this is approximately 3,900 feet; at Site 1, it is slightly less). In this distance, a single train can be "built" by combining loaded cars from individual loading tracks. Once a train is built, locomotives would couple-on to the west end and pull the train out of the loading area.

This available length would be able to accommodate a train of approximately 70 gondola cars containing approximately 7,350 tons of material, or approximately 4,900 bank CY of soil per train. If ABC cars were used, this track length would accommodate a train of approximately 41 ABC cars, holding 245 20-foot bulk containers, or approximately 5,640 tons of material, or approximately 3,760 bank CY of soil per train.

These quantities are approximate, dependent upon the empty weight of the cars used, the soil density, the weight of the covering system, the final track geometry, space required for locomotives, operational considerations, and other factors.

Depending on the operational patterns of SCRRA and UPRR, and the level and timeliness of service desired (which affects the cost of service) the track configuration at Site 2B could allow for the cars on four tracks (rather than on just two tracks, as has been assumed) to be loaded in the facility and subsequently assembled into a longer train by UPRR crews just prior to departure. This would require UPRR train crews to use the SCRRA siding for switching. However, it would essentially double the capacity of each train. Whether both railroads would allow this use of their existing infrastructure would need to be explored further.

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Because of the need to allow space for locomotives (which are only onsite during arrival and departure operations, but not necessarily during loading operations), the possible train lengths indicated here are less than the sum of the individual track capacities indicated on the conceptual plans. The additional loading track length would be used to store spare railcars, railcars needing repair, etc., at the extreme end of each track. Depending upon the final scale of the operation and scheduling flexibility, it may be beneficial to have separate short tracks for such repair work.

Assuming soil would be delivered to the loading site at a rate between approximately 413 and 1,027 bank CY per day, one train per week would need to depart the loading facility.

2.2.4.3 Rail Logistics

Common to nearly all rail operations is the need to avoid interrupting main line operations with the switching of railcars on the main line. This premise drives the track configurations and operational patterns at the site.

The main line at this location is owned and dispatched by the SCRRA (the agency that operates Metrolink), which operates many high-priority passenger trains. SCRRA effectively controls the ability of freight trains to access industries along the line. Any new freight operations would be required to comply with SCRRA's operational requirements to ensure uninterrupted passenger train operations.

The freight service on this line is provided by a separate entity, UPRR, which owns the franchise to provide freight service on this portion of SCRRA's tracks. Thus, in addition to meeting SCRRA's requirements, track configurations and switching operations must also meet UPRR's requirements. UPRR has indicated support of the concept of using this track for loading and shipping contaminated soil from SSFL and stated that approval from UPRR would be subject to formal review of a finalized transportation and public outreach plan (UPRR, 2016).

Concepts for Rail Transfer Site 2B keep freight switching off the main line by constructing a new lead track parallel to the main line. Based on aerial imagery, there appears to be adequate space for such a track. ROW acquisition may be required. This track would allow trains in the yard area to make "back-and-forth" switching movements required for loading without occupying the main line.

The lead track is accessed only from a turnout configured to allow eastbound trains to enter the site. This configuration was selected because, without detailed survey of the track alignment west of the tunnel portal, significant reconfiguration of the existing tracks would appear to be required in order to allow a train to enter either site from the east. This is an important consideration, since it limits the manner in which UPRR trains can access the site.

Empty trains arriving from the east (Van Nuys) can arrive at the switch to the site and then back - in to the site. However, because of the geometric limits to the track configuration, the locomotives would only be able to couple-on to the west end of the train. Thus, loaded trains would be required to pull out of the facility pointed westbound (with the locomotive at the front of the train). The locomotives would then park the loaded cars in the siding at Rail Site 2B to

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enable the locomotive to "run around" the train on the main line, in order to get to the east end of the train and enable an eastbound departure. This operation would require a great deal of main line and siding occupancy, and, while not anticipated could only be performed at night, when passenger trains do not operate and there are relatively few freight trains.

Under a more likely scenario, trains may need to depart Rail Site 2B westbound, and proceed as far west as UPRR's Oxnard yard. At Oxnard, locomotives would be moved to the other end of the train (run around the train), thus allowing the train to proceed eastbound (and passing by the loading site) to its final destination. This would increase operational complexity and costs, but may be necessary to avoid switching on the siding and main line.

2.2.4.4 Permitting Constraints

Implementation of the North American Cutoff Road Conveyor Route and Rail Site 2B is anticipated to require the same permits identified for the Edison Road Truck Route, as shown in Table 2-5. However, this potential option would also require access easements with the Mountains Recreation and Conservation Authority, and Rancho Simi Recreation and Park District, as well as permits from the County of Ventura. Required negotiations with such agencies/organizations would add a significant level of uncertainty to the ultimate project approval process and schedule.

UPRR would also ultimately require agreement with commercial terms (i.e., freight rates). Prior to entering this negotiation, it is necessary to know the destination; the railcar type; whether railcars would be supplied by the railroad or private cars would be purchased or leased; the length of train; the weight of each train; the travel time desired to the destination; the level of hazard of the cargo; the frequency of service; and the operational characteristics of the service.

SCRRA rarely deals with new freight customers, and would require at least 30 percent, 60 percent, and 100 percent design submittals for approval. SCRRA approval is critical since they own the tracks, provide passenger service, and dispatch the trains (though UPRR has freight rights in this area). The concept is predicated on a connection with SCRRA track and signal systems, and also use of a portion of SCRRA/Ventura County property, likely by lease or easement. The overall duration of obtaining railroad access and freight haulage agreements is estimated to be 4 to 8 months—this process would occur during the 15-month construction period.

2.2.4.5 Implementation Schedule

The schedule presented in **Table 2-10** shows development of this potential option would take approximately 48 months to complete upon certification of the PEIR for the SSFL project.

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TABLE 2-10
NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR IMPLEMENTATION SCHEDULE

Task Name	Duration	Start	Finish
Certification of SSFL PEIR	1 day	December 2017	December 2017
Design	12 months	December 2017	November 2018
Environmental Review (CEQA/NEPA)	30 months	January 2018	May 2020
Land Acquisition	26 months	May 2018	May 2020
Permitting	4 months	June 2020	September 2020
Construction	15 months	September 2020	November 2021
Operation	11 years	November 2021	November 2032
Decommissioning	13 months	November 2032	November 2033

Notes: Several tasks could occur concurrently. For instance:

- Design could begin as soon as DTSC selects a potential option to implement.
- Environmental review includes background technical studies and surveys necessary to complete CEQA and NEPA analyses.
- Land acquisition could begin as soon as DTSC selects a potential option to implement. The RPs would need to demonstrate land control in their application to the County of Ventura for a Conditional Use Permit. Property acquisition would not be completed until the CEQA and NEPA documents prepared for the project are approved.
- The operational duration of 15 years is based on the rate at which soil would be excavated at the SSFL site and assumes that soil would be transported via Woolsey Canyon while the North American Cutoff Road Overland Conveyor Route is being planned, permitted and constructed.

2.2.4.6 Construction Equipment and Workforce

Construction of this conveyor route is estimated to require the following construction equipment and employees:

Conveyor

- Two mobile hydraulic cranes
- Two portable welders
- Four service trucks
- One front-end loader
- Two bulldozers
- One backhoe
- One grader
- A crew of 12 workers

Rail Site

- One ballast regulator
- Two bulldozers
- One asphalt paver
- One compactor
- One crane
- Two dump trucks
- One excavator
- One forklift
- Two loaders
- One grader
- One railroad tamper
- A crew of 10 workers

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2.2.4.7 Cost

The estimated costs to develop the North American Cutoff Road Overland Conveyor Route and Rail Site 2B are provided in **Table 2-11**.

TABLE 2-11
ESTIMATED COST TO DEVELOP NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR

Item	Cost
Environmental Review (CEQA & NEPA)	$2,000,000
Land Purchase Price	$2,083,000
Conveyor Construction	$41,346,000
Rail Site Construction	$27,145,000
Permitting	$50,000
Decommissioning	$13,698,000
Total	**$86,322,000**

Notes:
Conveyor cost includes two-lane dirt road upgrade.
Construction costs are estimated at +50/-30 percent.
See Appendix B for detailed development costs.

The operating cost for this potential option is estimated on the basis of cost of power, operator and maintenance labor, repair parts, rail transport to landfills, tipping fees, and truck transport of backfill. It is estimated that the total operational cost of this potential option for the life of the project would be $672 million (this cost includes $160 million for the first 45 months of operation using Woolsey Canyon Road while this alternative is developed, plus $512 million for 11 years of operating this alternative). See Appendix B for more details about costs.

The costs presented here are the best estimate. Actual costs may vary due to the following variables:

- Destination (length of haul, railroad serving destination, congestion on lines, corridor capacity restrictions).
- Length and tonnage of each train (and thus train length capacities at both origin and destination).
- Responsibility for origination/destination switching.
- Whether intermediate switching is required.
- Fees for delivery of cars or trains by the railroad to a site where there is insufficient track space available to place the cars. In this scenario, the cars or train are returned to the yard of origin and the operator is charged.
- Desired quality of service (faster or more reliable services, where available, command a premium price).
- Frequency of service.

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- Ownership of railcars (railroad-owned, privately owned, private lease, type of lease, duration of lease, anticipated residual value, etc.).
- Speed of loading at the SSFL site and unloading at various destinations.

Without clarity on these variables, a likely cost to transport material by rail from Simi Valley would be approximately $0.10/net ton-mile. Assuming shipment to Clive, Utah, at approximately 900 rail miles (assuming one of the longer routes, of the multiple rail routing options available), the approximate range of rail shipping costs would be from $45/ton to $90/ton (to provide a conservative estimate, rail costs were developed using the $90 estimate).

Assuming shipment to Arlington, Oregon, at approximately 1,550 rail miles (assuming one of the longer routes, of the multiple rail routing options available), the approximate range of rail shipping costs would thus be from $78/ton to $155/ton (to provide a conservative estimate, rail costs were developed using the $155 estimate). Note that vertical clearance restrictions at tunnels may prevent double-stacked containers from transiting some of the shorter routes, though gondola cars would not be faced with any restrictions. Note that the final rail rates would be dependent on many factors, including the opportunity cost of capacity on a given route (that is, if all or even parts of a given route are congested, what other traffic might the potential traffic displace), cost of fuel, cost of railcars, overall demand for rail service (highly dependent upon overall economic conditions), and other variables, which can vary over time.

When soil removal cleanup activities are complete and the pipe conveyor is no longer needed for operations, the conveyor system and rail transfer site would be decommissioned.

2.2.5 North American Cutoff Road Aerial Conveyor

This section discusses a potential aerial conveyor route, from the east side of the SSFL site to Rail Site 2B on the east side of the study area. This route begins and ends at the same locations as the North American Cutoff Road Overland Conveyor described in Section 2.2.4 but follows a direct and linear route instead of the road itself (see Figure 4).

2.2.5.1 Required Land Acquisition or Right-of-Way

Aerial Conveyor Route

This conveyor route traverses 21 parcels that are either owned by one of five private owners or administered by one of two local government entities, including the Rancho Simi Recreation and Parks District and Mountains Recreation and Conservation Authority. To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners/government land administrators. None of these parcels are currently for sale. The land owners/administrators would need to be willing to sell or lease their parcels. Based on the current asking price of four other similar properties within 1 mile of this route, it is estimated that the properties along the route would cost approximately $168,000 per acre to purchase. It is assumed that the highest asking price out of the four similar properties currently for sale would be the best cost estimate for the private land needed to construct the North American Cutoff Road Aerial Conveyor because the required lands are currently not for sale, which would allow the existing owners to request a premium on the estimated land value. Required negotiations with multiple

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land owners for long term easements adds a significant level of uncertainty to land acquisition. Copies of the real estate listings used to calculate this average are provided in Appendix A.

Rail Site 2B

As discussed previously in Section 2.2.4.1, the land area for the rail transfer site and the related new siding length and width would total 11.9 acres. A proportion of the site would entail the purchase of private land, and the remainder would require lease or purchase of railroad ROW.

This rail site occupies seven parcels that are owned by unnamed private land owner(s). To lease or purchase the parcels, negotiations would need to take place between the RPs and the private land owners. None of these parcels are currently for sale. The private land owners would need to be willing to sell their parcels should the RPs seek to purchase the land. Based on the current asking price of four other similar properties within 1 mile of this rail site, it is estimated that the properties along the route would cost $168,000 per acre to purchase. Copies of the real estate listings used to calculate this average are provided in Appendix A.

2.2.5.2 Technological Feasibility

This route was identified as the preferred route for an aerial conveyor system. In order to minimize the handling of contaminated material, soil would be discharged directly from the ropeway into a horizontal silo at Rail Site 2B. This configuration would minimize the surface area required for the station.

The conceptual design of the conveyor route for this corridor has shown the technology would be feasible. The conceptual design considered vertical grades along the route, but detailed topography files were not used and engineering was not taken beyond an equivalent of 5 percent of total design. Geotechnical issues were not investigated for this engineering effort. Final engineering designs based on acquired/flown aerial photography and topographic maps, and geologic and property studies, would need to be conducted prior to final design.

2.2.5.3 Rail Logistics

This conveyor route would link to Rail Site 2B. The conveyor would have a northern terminus at that site, and materials would be transferred to railcars via transfer facilities constructed at that site as described in Section 2.2.4.3.

2.2.5.4 Permitting Constraints

Implementation of this potential option is anticipated to require the same permits identified for the Edison Road Truck Route as shown in Table 2-5. However, this potential option would also require access easements with the Mountains Recreation and Conservation Authority, Rancho Simi Recreation and Park District, as well as permits from the County of Ventura. Required negotiations with such agencies/organizations add a significant level of uncertainty to the ultimate project approval.

2.2.5.5 Implementation Schedule

The schedule presented in **Table 2-12** shows development of this potential option would take approximately 45 months to complete upon certification of the PEIR for the SSFL project.

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TABLE 2-12
NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR IMPLEMENTATION SCHEDULE

Task Name	Duration	Start	Finish
Certification of SSFL PEIR	1 day	December 2017	December 2017
Design	3 months	December 2017	November 2018
Environmental Review (CEQA/NEPA)	30 months	January 2018	May 2020
Land Acquisition	26 months	May 2018	May 2020
Permitting	4 months	June 2020	September 2020
Construction	12 months	September 2020	August 2021
Operation	11 years	August 2021	November 2032
Decommissioning	13 months	November 2032	November 2033

Notes: Several tasks could occur concurrently. For instance:

- Design could begin as soon as DTSC selects a potential option to implement.
- Environmental review includes background technical studies and surveys necessary to complete CEQA and NEPA analyses.
- Land acquisition could begin as soon as DTSC selects a potential option to implement. The RPs would need to demonstrate land control in their application to the County of Ventura for a Conditional Use Permit. Property acquisition would not be completed until the CEQA and NEPA documents prepared for the project are approved.
- The operational duration of 15 years is based on the rate at which soil would be excavated at the SSFL site and assumes that soil would be transported via Woolsey Canyon Road, while the Edison Road overland conveyor route is being planned, permitted and constructed.

2.2.5.6 Construction Equipment and Workforce

Construction of this conveyor route is estimated to require the following construction equipment and employees:

Conveyor

- Two cranes
- Two bulldozers
- Two dump trucks
- Two excavators
- Two forklifts
- Two trucks
- A crew of 16 workers

Rail Site

- One ballast regulator
- Two bulldozers
- One asphalt paver
- One compactor
- One crane
- Two dump trucks
- One excavator
- One forklift
- Two loaders
- One grader
- One railroad tamper
- A crew of 10 workers

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2.2.5.7 Cost

The estimated costs to develop the North American Cutoff Road Aerial Conveyor Route and Rail Site 2B are provided in **Table 2-13**.

TABLE 2-13
ESTIMATED COST TO DEVELOP NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR

Item	Cost
Environmental Review (CEQA & NEPA)	$2,000,000
Land Purchase Price	$2,083,200
Conveyor Construction	$12,953,000
Rail Site Construction	$27,145,000
Permitting	$50,000
Decommissioning	$8,020,000
Total	**$52,251,000**

Notes:
Construction costs are estimated at +50/-30 percent.

The operating cost for this potential option is estimated on the basis of cost of power, operator and maintenance labor, repair parts, rail transport to landfills, tipping fees, and truck transport of backfill. It is estimated that the total operational cost of this potential option for the life of the project would be $672 million (this cost includes $160 million for the first 45 months of operation using Woolsey Canyon Road while this alternative is developed, plus $512 million for 11 years of operating this alternative).

When all soil removal cleanup activities are complete and the aerial conveyor is no longer required for operations, the conveyor system would be decommissioned.

3.0 Environmental Analysis

This section evaluates potential environmental issues and environmental effects associated with the development and operation of each feasible transport and conveyance route discussed in Section 2.2. Each route was evaluated for potential environmental impacts related to:

- Air Quality and GHG
- Biological Resources
- Cultural Resources
- Energy Consumption
- Land Use Compatibility
- Noise
- Traffic

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3.1 Air Quality and Greenhouse Gases

Construction and operational air quality and GHG emissions for all analyzed routes would occur within the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD), the Southern California Air Quality Management District (SCAQMD), as well as numerous air districts between the edge of the SCAQMD's borders and the disposal site. Because the purpose of this analysis is to compare the potential options to each other, the analysis does not break down the transportation emissions by air districts other than the VCAPCD and SCAQMD. However, in order to provide a true comparison, the total emissions for each potential option are also reported. The following pollutants were analyzed for all potential route options presented in this analysis:

- Reactive Organic Compounds (ROC)/Volatile Organic Compounds (VOC)
- Nitrogen Oxides (NO_x)
- Carbon Monoxide (CO)
- Sulfur Oxides (SO_x)
- Particulate Matter, 10 and 2.5 micrometers in size (PM10 and PM2.5)
- Greenhouse Gases (CO_2e)

Emissions calculations for the construction and operational activities associated with each of the potential options were calculated using the same methodology as applied to the proposed project evaluated in the PEIR. Detailed assumptions as well as all emissions calculations for each of the potential options are included in Appendix D.

For the purposes of this analysis, the Woolsey Canyon Road Truck Route represents the emissions from the proposed project as analyzed in the PEIR and is used for comparison of operational emissions for the other potential options presented herein. While the PEIR focuses on emissions only within the borders of California, because the truck and train disposal options have the potential to terminate outside California's borders, the transportation emissions for the total distance is reported herein to adequately compare the operational emissions associated with each potential option. Therefore emissions from the Woolsey Canyon Road Truck Route do not directly correlate with the transportation emissions for the proposed project as presented in the PEIR.

With respect to construction activities, because the Woolsey Canyon Road Truck Route does not require construction, all other potential options would exceed the construction emissions associated with the proposed project as analyzed in the PEIR. For further comparison, the construction emissions associated with each potential option are compared to regional thresholds. Because the Woolsey Canyon Road Truck Route would be operational during the construction timeframe of the other potential options, the combined operational emissions from the Woolsey Canyon Road Truck Route and construction emissions from the other potential options are compared to the operational thresholds of each applicable air district.

Note that this analysis does not include the onsite emissions that would occur at the site itself with respect to excavation and other onsite activities. Because the onsite activities would remain

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the same regardless of the potential disposal option chosen, only the transportation emissions and construction activities associated with each of the transportation alternatives are discussed in this analysis. Therefore, while emissions in this feasibility analysis may show below the thresholds for various alternatives, this is only in respect to the transportation emissions alone. When these transportation emissions are added to the onsite emissions from remediation activities, the total daily emissions would exceed regulatory thresholds for NOx regardless of the transportation alternative chosen.

When introducing rail usage to replace haul trucks, trains can be on average four times more fuel efficient and reduce criteria pollutant and GHG emissions (AAR, 2016). This is based on a comparison of composite truck fleet to newer fuel efficient trains. However, because there the project does not have control over the train engine being utilized, a composite fleet for the UPRR rail road was used to determine emission factors. The composite fleet includes engines that range from uncontrolled emissions through the ultra-efficient Tier 4 engine rating. Additionally, in order to reach a disposal facility that accepts the waste types generated by the project, the train would have to travel substantially greater distances than the trucks. Further, the analysis incorporates all of the mitigation measures from the proposed project, with the exception of Mitigation Measure GHG-3 which is identified specifically for each option below. This is because the implementation of Mitigation Measure GHG-3 reduces the GHG emissions from all scenarios to the same level and therefore does not allow for a strong comparison of the options. The mitigation measures from the proposed project incorporate a Tier 4 construction fleet and a 2014 or newer haul truck fleet which substantially reduces pollutant emissions. Therefore, while instinctively the rail options should be more efficient than the truck options, that is not the case in this analysis as is detailed below.

3.1.1 Woolsey Canyon Road Truck Route

Implementation of the Woolsey Canyon Road Truck Route would not require any construction activities because the route consists of existing roadways. Operational emissions from the Woolsey Canyon Road Truck Route and the associated VCAPCD and SCAQMD thresholds are shown in **Table 3-1**. The identified thresholds are based on the Air Districts' plans to achieve or maintain attainment for State and Federal emissions. As shown, the trucking emissions from the Woolsey Canyon Road Truck Route would not exceed any of the regulatory thresholds. While the Woolsey Canyon Road Truck Route does not enter the City of Simi Valley, emissions from this potential option are compared with the Simi Valley thresholds as an additional comparison for the other potential options.

Implementation of the potential option would incrementally contribute to GHG emissions along with past, present, and future activities, and the CEQA Guidelines acknowledge this as a cumulative impact. As such, impacts of GHG emissions are analyzed here on a cumulative basis.

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TABLE 3-1
WOOLSEY CANYON ROAD TRUCK ROUTE AIR EMISSIONS

Scenario	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Woolsey Canyon - Total	8	143	52	5	1	1
Woolsey Canyon - (VCAPCD)	<1	1	1	<1	<1	<1
Woolsey Canyon - (SCAQMD)	1	24	9	1	<1	<1
Woolsey Canyon (Other)[2]	7	118	43	4	1	1
Regional Thresholds by Air District						
VCAPCD[3]	25	25	N/A	N/A	N/A	N/A
SCAQMD[4]	*55*	*55*	*550*	*150*	*100*	*55*
Tons/Year						
Woolsey Canyon –(VCAPCD)	<1	<1	<1	<1	<1	<1
Local Thresholds						
City of Simi Valley[2]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD

2 Other represents emissions from vehicle miles traveled outside of SCAQMD and VCAPCD jurisdictions.

3 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm

4 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

*The < designation indicates that there are emissions however they are less than the indicated value.

SOURCE: ESA 2017

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The VCAPCD has not adopted a significance threshold with respect to GHG emissions. Their most recent proposal of emissions (VCAPCD, 2011) summarizes the most prominent approaches and options that have been adopted or considered, including having a tiered approach that involves first applicability of CEQA exemptions, followed by consistency with a local climate action plan, then by an efficiency-based threshold and/or a bright line gap-based threshold. The other potential options include thresholds based on capturing 90 percent of project GHG emissions or thresholds based on air agencies' criteria pollutant thresholds. Based on this report, VCAPCD is still evaluating suitable GHG thresholds but holds preference for GHG thresholds consistent with the SCAQMD and Southern California Association of Governments region.

SCAQMD has adopted an annual screening level threshold of 10,000 metric tons carbon dioxide equivalents (MT CO_2e) for industrial projects for which the SCAQMD is the CEQA lead agency or has discretionary approval (SCAQMD, 2008). SCAQMD, in accordance with CEQA Guidelines Section 15064.7, adopted its annual threshold for industrial sources under a public review process as part of stakeholder working group meetings that were open to the public and based on substantial evidence. The intent of the threshold is to capture 90 percent of total emissions from all new or modified industrial and stationary source sector projects subject to a CEQA analysis where SCAQMD is the lead agency. Data collected by SCAQMD from its

Annual Emissions Reporting (AER) Program indicates that a 90 percent capture rate would cover a substantial portion of future project emissions and would exclude small projects that would in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions (SCAQMD, 2008). The SCAQMD estimates that these small projects would in aggregate contribute less than 1 percent of the future 2050 statewide GHG emissions target.

The County of Los Angeles has a Community Climate Action Plan which addresses county emissions and how development within the County can reduce emissions and comply with the State regulations. However, the proposed project is not within the jurisdiction of Los Angeles County and therefore the climate action plan is not applicable to the proposed project.

The City of Los Angeles *L.A. CEQA Thresholds Guide* (City of Los Angeles, 2006) does not provide guidance on how climate change issues should be addressed in CEQA documents, nor has the City of Los Angeles adopted specific thresholds with respect to GHG emissions.

Although no formal significance threshold for GHG emissions associated with this type of project has been adopted by the Cities of Los Angeles or Simi Valley, the County of Ventura, County of Los Angeles, VCAPCD, or SCAQMD at this juncture, Section 15064.7(c) of the CEQA Guidelines states: "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies…" SCAQMD's 10,000 MT CO_2e per year threshold applies to a project's annual long-term GHG emissions. The proposed project would generate the majority of its GHG emissions over a 15-year period. The majority of project GHG emissions would cease after remediation activities are completed. Monitoring and maintenance activities would continue until no longer necessary.

Because the County of Ventura, County of Los Angeles, City of Los Angeles or Simi Valley, and VCAPCD have not adopted any significance criteria for GHG analysis at the time of this writing, it is reasonable for the CEQA Lead Agency to use the threshold adopted by SCAQMD. Additionally, for CEQA purposes, DTSC has determined that the appropriate threshold of significance to assess the GHG impacts of a project of this nature is SCAQMD's 10,000 $MTCO_2e$ per year threshold.

Table 3-2 shows the GHG emissions from Woolsey Canyon Road Truck Route.

TABLE 3-2
WOOLSEY CANYON ROAD TRUCK ROUTE GHG EMISSIONS

	CO_2e MT/yr
Woolsey Canyon Road	11,128
Mitigation GHG-3	(1,129)
Mitigated Total	9,999
Regional Thresholds by Air District	
SCAQMD	10,000

* The inclusion of parenthetical notation indicates a negative number.

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As shown in Table 3-1, operational emissions would not exceed the criteria pollutant emissions thresholds for VCAPCD or SCAQMD. As shown in Table 3-2, the operational emissions from the Woolsey Canyon Road Truck Route would not exceed the SCAQMD GHG threshold with the implementation of Mitigation Measure GHG-3 *GHG Reduction Plan*.

After completion of all soil removal activities, Woolsey Canyon Road would not be decommissioned. Therefore, there would be no air pollutant or GHG emissions from equipment, labor and worker trips related to decommissioning.

3.1.2 Edison Road Truck Route

Implementation of the Edison Road Truck Route would require substantial grading to provide a paved, all-weather roadway usable by diesel haul trucks for soil transport. Once completed, project operations would require the same number of daily truck trips as identified for the Woolsey Canyon Road Truck Route, however the total distance traveled would change slightly due to the location. Because construction would terminate within the City of Simi Valley limits, emissions are also compared to the Simi Valley Thresholds.

Construction emissions from upgrading Edison Road are shown in **Table 3-3**, which assumes that fugitive dust emissions reductions would occur in accordance with the VCAPCD regulations. As shown, total combined construction and operational emissions would exceed the SCAQMD and VCAPCD regional thresholds and the annual Simi Valley threshold for NOx without the inclusion of the onsite equipment usage for excavation and hauling for the remediation activities.

Operational emissions from the Edison Road Truck Route are shown in **Table 3-4**. The identified thresholds are based on the VCAPCD's plans to achieve or maintain attainment for State and Federal emissions. As shown, operational emissions from the Edison Road Truck Route would not exceed the regulatory thresholds and would not result in a significant increase over the Woolsey Canyon Road Truck Route. This potential option would result in an overall reduction in criteria pollutant emissions when compared to the Woolsey Canyon Truck Route.

GHG emissions would occur from both construction and operation. **Table 3-5** shows the construction GHG emissions anticipated from the Edison Road Truck Route to Truck Site 1. Because of the cumulative nature of GHG emissions, construction and operational GHG emissions are compared to the SCAQMD threshold. As shown, GHG emissions from construction alone would not exceed the threshold, however because the Woolsey Canyon Road Truck Route would operate during construction of the Edison Road Truck Route, the total emissions of these two sources must be compared to the threshold. The construction and operation of the Edison Road Truck Route would not exceed regulatory thresholds with the incorporation of Mitigation Measure GHG-3.

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TABLE 3-3
EDISON ROAD TRUCK ROUTE CONSTRUCTION AIR EMISSIONS

	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Construction Emissions						
Construction Total	2	41	70	<1	14	7
Construction within VCAPCD	2	39	75	<1	14	7
Construction within SCAQMD	2	40	78	<1	14	7
Woolsey Canyon Operational Emissions[2]						
Woolsey Canyon - Total	3	50	19	2	<1	<1
Woolsey Canyon - within VCAPCD	<1	1	1	<1	<1	<1
Woolsey Canyon – within SCAQMD	1	24	9	1	<1	<1
Total Emissions						
Total	5	91	97	2	14	7
Within VCAPCD	2	41	76	<1	14	7
Within SCAQMD	4	64	87	1	14	7
Regional Thresholds by Air District						
VCAPCD[3]	25	**25**	N/A	N/A	N/A	N/A
SCAQMD[4]	*55*	***55***	*550*	*150*	*100*	*55*
Tons/Year						
Edison Road Truck Route[5]	1	**20**	17	1	<1	<1
Local Thresholds						
City of Simi Valley[3]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.

2 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

3 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm

4 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

5 The tons/year emissions include the operational emissions from hauling using the Woolsey Canyon truck Route.

*The < designation indicates that there are emissions however they are less than the indicated value.

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TABLE 3-4
EDISON ROAD TRUCK ROUTE OPERATIONAL AIR EMISSIONS

Scenario	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds / Day						
Total	2	37	14	1	<1	<1
within VCAPCD	<1	2	2	<1	<1	<1
within SCAQMD	1	11	3	<1	<1	<1
Regional Thresholds by Air District & Woolsey Canyon Road Comparison						
VCAPCD[2]	25	25	N/A	N/A	N/A	N/A
SCAQMD[3]	*55*	*55*	*550*	*150*	*100*	*55*
Woolsey Canyon- Total	3	50	19	2	<1	<1
Tons / Year						
Total (VCAPCD)	<1	5	2	<1	<1	<1
Local Thresholds						
City of Simi Valley[2]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.
2 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm
3 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

*The < designation indicates that there are emissions however they are less than the indicated value.

TABLE 3-5
EDISON ROAD TRUCK ROUTE CONSTRUCTION GHG EMISSIONS

		CO_2e MT/yr
Edison Road Truck Route (Construction)		1,896
Woolsey Canyon Road[1]		11,128
Mitigation GHG-3		(3,026)
	Total	**9,999**
Regional Thresholds by Air District		
SCAQMD		10,000

1 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.
* The inclusion of parenthetical notation indicates a negative number.

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Table 3-6 shows the operational emissions from this route once construction is completed. As shown the operational emissions would exceed the 10,000 MT/yr threshold and would be slightly higher than the Woolsey Canyon Truck Route prior to the implementation of Mitigation Measure GHG-3. With inclusion of mitigation measure GHG-3 the Edison Road Truck Route would not exceed regulatory thresholds.

TABLE 3-6
EDISON ROAD TRUCK ROUTE OPERATIONAL GHG EMISSIONS

	CO_2e MT/yr
Edison Road Truck Route	11,184
Mitigation GHG-3	(1,185)
Mitigated Total	9,999
Regional Threshold & Woolsey Canyon Road Comparison	
SCAQMD	10,000
Woolsey Canyon Road[1]	11,128

[1] Woolsey Canyon Operational Emissions do not include incorporation of Mitigation Measure GHG-3 for comparison purposes.
* The inclusion of parenthetical notation indicates a negative number.

After completion of all soil removal activities, the Edison Road Truck Route would be decommissioned and removed. The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of air pollutant and GHG emissions from the decommissioning process are anticipated to be similar to or less than the emissions generated during the construction phase.[12] Emissions related to decommissioning of this potential option would not occur under the Woolsey Canyon Road Truck Route.

3.1.3 Edison Road Overland Conveyor

Implementation of the Edison Road Overland Conveyor Route would terminate at Truck Site 1. Soil from SSFL would be exported from the site via conveyor to Truck Site 1. From the truck site, trucks would continue to the same disposal sites as identified for the overall cleanup project evaluated in the PEIR.

Construction emissions from developing the Edison Road Overland Conveyor Route are shown in **Table 3-7**, which assumes that fugitive dust emissions reductions would occur in accordance with the VCAPCD regulations. As shown, total combined construction and operational emissions

[12] Because air quality emissions are compared to thresholds on a maximum daily basis, and GHG emissions are compared on a maximum annual basis (as opposed to total emissions over the life of the project), emissions specific to the decommissioning process are not needed to be quantified. Emissions from decommissioning are anticipated to be similar to or less than the construction phase and therefore the maximum daily and annual emissions presented would not change if decommissioning activities were quantified.

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would not exceed either the SCAQMD or VCAPCD regional thresholds for NOx, and would not exceed the annual Simi Valley thresholds for ROC or NOx.

Operational emissions from the Edison Road Overland Conveyor Route are shown in **Table 3-8**. As shown, operational emissions from the Edison Road Overland Conveyor Route would neither exceed the regulatory thresholds, nor result in a significant increase over the Woolsey Canyon Road Truck Route. This potential option would result in an overall reduction in criteria pollutant emissions when compared to the Woolsey Canyon Truck Route.

TABLE 3-7
EDISON ROAD OVERLAND CONVEYOR CONSTRUCTION AIR EMISSIONS

	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Construction Emissions						
Construction Total	3	46	92	<1	13	7
Construction within VCAPCD	3	44	87	<1	13	7
Construction within SCAQMD	3	46	92	<1	13	7
Woolsey Canyon Road Operational Emissions[2]						
Woolsey Canyon - Total	3	50	19	2	<1	<1
Woolsey Canyon - within VCAPCD	<1	1	1	<1	<1	<1
Woolsey Canyon – within SCAQMD	1	24	9	1	<1	<1
Total Emissions						
Total	6	97	111	2	14	7
Within VCAPCD	3	**46**	88	<1	13	7
Within SCAQMD	4	**70**	100	1	13	7
Regional Thresholds by Air District						
VCAPCD[3]	25	25	N/A	N/A	N/A	N/A
SCAQMD[4]	*55*	*55*	*550*	*150*	*100*	*55*
Tons/Year						
Edison Road Truck Route[5]	1	**13**	14	<1	2	1
Local Thresholds						
City of Simi Valley[3]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.

2 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

3 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm

4 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

5 The tons/year emissions include the operational emissions from hauling using the Woolsey Canyon truck Route.

*The < designation indicates that there are emissions however they are less than the indicated value.

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TABLE 3-8
EDISON ROAD OVERLAND CONVEYOR OPERATIONAL AIR EMISSIONS

	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Total	2	37	14	1	<1	<1
within VCAPCD	<1	2	2	<1	<1	<1
within SCAQMD	1	11	3	<1	<1	<1
Regional Thresholds by Air District & Woolsey Canyon Road Comparison						
VCAPCD[2]	25	25	N/A	N/A	N/A	N/A
SCAQMD[3]	*55*	*55*	*550*	*150*	*100*	*55*
Woolsey Canyon- Total	3	50	19	2	<1	<1
Tons / Year						
Total (VCAPCD)	<1	5	2	<1	<1	<1
Local Thresholds						
City of Simi Valley[2]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.
2 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm
3 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

*The < designation indicates that there are emissions however they are less than the indicated value.

GHG emissions would occur from both construction and operation. **Table 3-9** shows the construction GHG emissions anticipated from the Edison Road Overland Conveyor Route. Because of the cumulative nature of GHG emissions, construction and operational GHG emissions are compared to the SCAQMD threshold. As shown, GHG emissions from construction alone would not exceed the threshold, however because the Woolsey Canyon Road Truck Route would operate during construction of the Edison Road Truck Route, the total emissions of these two sources must be compared to the threshold. The construction and operation of the Edison Road Truck Route would not exceed the threshold with the incorporation of Mitigation Measure GHG-3..

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TABLE 3-9
EDISON ROAD OVERLAND CONVEYOR CONSTRUCTION GHG EMISSIONS

	CO_2e MT/yr
Edison Road Overland Conveyor (Construction)	1,159
Woolsey Canyon Road[1]	11,128
Mitigation GHG-3	(2,288)
Total	**9,999**
Regional Thresholds by Air District	
SCAQMD	10,000

[1] Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.
* The inclusion of parenthetical notation indicates a negative number.

Table 3-10 shows the operational emissions from this route once construction is completed. As shown the operational emissions would exceed regulatory thresholds and would be slightly higher than the Woolsey Canyon Truck Route prior to the implementation of Mitigation Measure GHG-3. With inclusion of mitigation measure GHG-3 the Edison Road Truck Route would not exceed the 10,000 Mt CO_2e threshold.

TABLE 3-10
EDISON ROAD TRUCK ROUTE OPERATIONAL GHG EMISSIONS

	CO_2e MT/yr
Edison Road Overland Conveyor	12,701
Mitigation GHG-3	(2,702)
Mitigated Total	9,999
Regional Threshold & Woolsey Canyon Road Comparison	
SCAQMD	10,000
Woolsey Canyon Road[1]	11,128

[1] Woolsey Canyon Operational Emissions do not include incorporation of Mitigation Measure GHG-3 for comparison purposes.
* The inclusion of parenthetical notation indicates a negative number.

After completion of all soil removal activities, the Edison Road Overland Conveyor would be decommissioned and removed. The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of air pollutant and GHG emissions from the decommissioning process are anticipated to be similar to or less than the emissions generated during the construction phase. Emissions related to decommissioning of this potential option would not occur under the Woolsey Canyon Road Route.

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3.1.4 North American Cutoff Road Overland Conveyor

Implementation of the North American Cutoff Road Overland Conveyor Route would terminate at Rail Site 2B. Once completed, the conveyor would be used to transport soil to Rail Site 2B. The soil would be loaded onto trains and transported to a disposal site. While the excavated soils would be removed via train, the backfill needed for the site would need to be transported by truck to the SSFL site. Therefore, trucking emissions associated with the backfill transport are included in the emissions estimates for this potential option. [13]

Construction emissions from the development of the conveyor and Rail Site 2B are presented in **Table 3-11**, which assumes that fugitive dust emissions reductions would occur in accordance with the VCAPCD regulations. Also it assumes that construction activities for the conveyor route and Rail Site 2B would occur at the same time. As shown, total combined construction and operational emissions would exceed both the SCAQMD and VCAPCD regional threshold for NOx, however would be below the annual Simi Valley thresholds.

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[13] Access to Rail Transfer Site 2B would be from Smith Road, a local street that is lined with single family residences. Due to (1) width of this residential roadway, (2) proximity of residences, (3) the size and configuration of the rail site cannot reasonably accommodate stockpiled backfill, and (4) the additional handling of backfill, transport to Rail Transfer Site 2B by truck of clean backfill for conveyance to SSFL is not considered in this analysis.

TABLE 3-11
NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR CONSTRUCTION AIR EMISSIONS

	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Construction Emissions						
Construction Total	2	35	65	<1	15	8
Construction within VCAPCD	2	34	64	<1	15	8
Construction within SCAQMD	2	35	65	<1	15	8
Woolsey Canyon Road Operational Emissions[2]						
Woolsey Canyon - Total	3	50	19	2	<1	<1
Woolsey Canyon - within VCAPCD	<1	1	1	<1	<1	<1
Woolsey Canyon – within SCAQMD	1	24	9	1	<1	<1
Total Emissions						
Total	5	85	84	2	15	8
Within VCAPCD	2	**36**	65	<1	15	8
Within SCAQMD	3	**58**	74	1	15	8
Regional Thresholds by Air District						
VCAPCD[3]	25	25	N/A	N/A	N/A	N/A
SCAQMD[4]	*55*	*55*	*550*	*150*	*100*	*55*
Tons/Year						
Edison Road Truck Route[5]	1	11	11	1	2	1
Local Thresholds						
City of Simi Valley[3]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.

2 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

3 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm

4 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

5 The tons/year emissions include the operational emissions from hauling using the Woolsey Canyon truck Route.

*The < designation indicates that there are emissions however they are less than the indicated value.

Operational emissions from the North American Cutoff Road Overland Conveyor Route are shown in **Table 3-12**. As shown, the operational emissions from the North American Cutoff Road Overland Conveyor Route would exceed the SCAQMD's regulatory threshold for NOx. In addition, overall emissions would exceed the Woolsey Canyon Road Route for all criteria pollutants.

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TABLE 3-12
NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR OPERATIONAL AIR EMISSIONS

Scenario	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Total	176	2,816	675	46	112	108
within VCAPCD	0	5	2	0	0	0
within SCAQMD	29	**462**	119	8	18	18
Regional Thresholds by Air District & Woolsey Canyon Road Comparison						
VCAPCD[2]	25	25	N/A	N/A	N/A	N/A
SCAQMD[3]	*55*	*55*	*550*	*150*	*100*	*55*
Woolsey Canyon- Total	3	50	19	2	<1	<1
Tons / Year						
Total (VCAPCD)	<1	1	<1	<1	<1	<1
Local Thresholds						
City of Simi Valley[2]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD
2 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm
3 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

*The < designation indicates that there are emissions however they are less than the indicated value.

GHG emissions would occur from both construction and operation. **Table 3-13** shows the construction GHG emissions anticipated from the North American Cutoff Road Overland Conveyor Route. . Because of the cumulative nature of GHG emissions, construction and operational GHG emissions are compared to the SCAQMD threshold. As shown, GHG emissions from construction alone would not exceed the threshold, however because the Woolsey Canyon Road Truck Route would operate during construction of the North American Cutoff Road Overland Conveyor Route, the total emissions of these two sources must be compared to the threshold. Construction and operation of the North American Cutoff Road Overland Conveyor Route would not exceed the applicable threshold with the incorporation of Mitigation Measure GHG-3..

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TABLE 3-13
NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR CONSTRUCTION GHG EMISSIONS

	CO2e MT/yr
North American Cutoff Road Overland Conveyor (Construction)	1,110
Woolsey Canyon Road[1]	11,128
Mitigation GHG-3	(2,240)
Total	**9,999**
Regional Thresholds by Air District	
SCAQMD	10,000

1 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

* The inclusion of parenthetical notation indicates a negative number.

Table 3-14 shows the operational emissions from this route once construction is completed. Depending on the type of train used, one train per week would leave the site. As shown the operational emissions would exceed the applicable threshold and the Woolsey Canyon Road Truck Route prior to incorporation of mitigation measure GHG-3. With incorporation of mitigation measure GHG-3, overall emissions would be reduced to below regulatory thresholds.

TABLE 3-14
NORTH AMERICAN CUTOFF ROAD OVERLAND CONVEYOR OPERATIONAL GHG EMISSIONS

	CO_2e MT/yr
North American Cutoff Road Overland Conveyor	19,762
Mitigation GHG-3	(9,763)
Mitigated Total	9,999
Regional Threshold & Woolsey Canyon Road Comparison	
SCAQMD	10,000
Woolsey Canyon Road[1]	11,128

1 Woolsey Canyon Operational Emissions do not include incorporation of Mitigation Measure GHG-3 for comparison purposes.

* The inclusion of parenthetical notation indicates a negative number.

After completion of all soil removal activities, the North American Cutoff Road Overland Conveyor would be decommissioned and removed. The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of air pollutant and GHG emissions from the decommissioning process are anticipated to be similar to or less than the emissions generated during the construction phase. Emissions related to decommissioning of this potential option would not occur under the Woolsey Canyon Road Route.

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3.1.5 North American Cutoff Road Aerial Conveyor

This analysis assumes that implementation of the North American Cutoff Road Aerial Conveyor Route would terminate at Rail Site 2B. Once completed, the conveyor would be used to transport soil to Rail Site 2B. The soil would be loaded onto trains and transported to a disposal site. While the excavated soils would be removed via train, the backfill needed for the site would need to be transported by truck to the SSFL site. Therefore, trucking emissions associated with the backfill transport are included in the emissions estimates for this potential option. [14]

Construction emissions from development of the conveyor and Rail Site 2B are presented in **Table 3-15**, which assumes that fugitive dust emissions reductions would occur in accordance with VCAPCD regulations. Also it assumes that construction activities for the conveyor route and Rail Site 2B would occur at the same time. As shown, total combined construction and operational emissions would not exceed the SCAQMD or VCAPCD regional thresholds or the annual Simi Valley thresholds.

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[14] Access to Rail Transfer Site 2B would be from Smith Road, a local street that is lined with single family residences. Due to (1) width of this residential roadway, (2) proximity of residences, (3) the size and configuration of the rail site cannot reasonably accommodate stockpiled backfill, and (4) the additional handling of backfill, transport to Rail Transfer Site 2B by truck of clean backfill for conveyance to SSFL is not considered in this analysis.

TABLE 3-15
NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR CONSTRUCTION AIR EMISSIONS

	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Construction Emissions						
Construction Total	2	21	45	<1	20	11
Construction within VCAPCD	2	21	43	<1	20	11
Construction within SCAQMD	2	21	45	<1	20	11
Woolsey Canyon Road Operational Emissions[2]						
Woolsey Canyon - Total	3	50	19	2	<1	<1
Woolsey Canyon - within VCAPCD	<1	1	1	<1	<1	<1
Woolsey Canyon – within SCAQMD	1	24	9	1	<1	<1
Total Emissions						
Total	5	71	64	2	20	11
Within VCAPCD	2	22	44	<1	20	11
Within SCAQMD	3	45	54	1	20	11
Regional Thresholds by Air District						
VCAPCD[3]	25	25	N/A	N/A	N/A	N/A
SCAQMD[4]	*55*	*55*	*550*	*150*	*100*	*55*
Tons/Year						
Edison Road Truck Route[5]	1	9	8	<1	3	1
Local Thresholds						
City of Simi Valley[3]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.

2 Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

3 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm

4 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

5 The tons/year emissions include the operational emissions from hauling using the Woolsey Canyon truck Route.

*The < designation indicates that there are emissions however they are less than the indicated value.

Operational emissions from the North American Cutoff Road Aerial Conveyor Route are shown in **Table 3-16**. As shown, the operational emissions would exceed SCAQMD's regulatory threshold for NOx. In addition, overall emissions would exceed the Woolsey Canyon Road Route for all criteria pollutants.

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TABLE 3-16
NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR OPERATIONAL AIR EMISSIONS

Scenario	ROC/VOC[1]	NOx	CO	SOx	PM10	PM2.5
Pounds/Day						
Total	177	2,828	691	47	112	108
within VCAPCD	<1	5	2	<1	<1	<1
within SCAQMD	29	**462**	119	8	18	18
Regional Thresholds by Air District & Woolsey Canyon Road Comparison						
VCAPCD[2]	25	25	N/A	N/A	N/A	N/A
SCAQMD[3]	*55*	*55*	*550*	*150*	*100*	*55*
Woolsey Canyon- Total	3	50	19	2	<1	<1
Tons/Year						
Total (VCAPCD)	<1	1	<1	<1	<1	<1
Local Thresholds						
City of Simi Valley[2]	13.7	13.7	N/A	N/A	N/A	N/A

1 In the analysis ROGs are used as a surrogate for ROCs regulated by VCAPCD and VOCs regulated by SCAQMD.
2 VCAPCD. 2003. Ventura County Air Quality Assessment Guidelines. October. Available: http://www.vcapcd.org/environmental_review.htm
3 SCAQMD. 2015b. SCAQMD Air Quality Significance Thresholds. Accessed at < http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook> on March 30, 2015.

*The < designation indicates that there are emissions however they are less than the indicated value.

GHG emissions would occur from both construction and operation. **Table 3-17** shows the construction GHG emissions anticipated from the North American Cutoff Road Aerial Conveyor Route. Because of the cumulative nature of GHG emissions, construction and operational GHG emissions are compared to the SCAQMD threshold. As shown, GHG emissions from construction alone would not exceed the threshold, however because the Woolsey Canyon Road Truck Route would operate during construction of the North American Cutoff Road Aerial Conveyor Route, the total emissions of these two sources must be compared to the threshold. The construction and operation of the North American Cutoff Road Aerial Conveyor Route would not exceed the applicable threshold with the incorporation of Mitigation Measure GHG-3.

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TABLE 3-17
NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR CONSTRUCTION GHG EMISSIONS

	CO_2e MT/yr
North American Cutoff Road Aerial Conveyor	949
Woolsey Canyon Road[1]	11,128
Mitigation GHG-3	(2,801)
Mitigated Total	**9,999**
Regional Thresholds by Air District	
SCAQMD	10,000

[1] Woolsey Canyon Operational Emissions represent the emissions from hauling soil over the Woolsey Canyon truck route while the Edison Road Truck route is being constructed. Regional air quality emissions are cumulative for daily activities of a project regardless of the location where they occur.

* The inclusion of parenthetical notation indicates a negative number.

Table 3-18 shows the operational emissions from this route once construction is completed. Depending on the type of train used, one train per week would leave the site. As shown the operational emissions would exceed the applicable threshold and the Woolsey Canyon Road Truck Route prior to incorporation of mitigation measure GHG-3. With incorporation of mitigation measure GHG-3, overall emissions would be reduced to below the thresholds.

TABLE 3-18
NORTH AMERICAN CUTOFF ROAD AERIAL CONVEYOR OPERATIONAL GHG EMISSIONS

	CO_2e MT/yr
North American Cutoff Road Aerial Conveyor	21,886
Mitigation GHG-3	(11,887)
Mitigated Total	9,999
Regional Threshold & Woolsey Canyon Road Comparison	
SCAQMD	10,000
Woolsey Canyon Road[1]	11,128

[1] Woolsey Canyon Operational Emissions do not include incorporation of Mitigation Measure GHG-3 for comparison purposes.

* The inclusion of parenthetical notation indicates a negative number.

After completion of all soil removal activities, the North American Cutoff Road Aerial Conveyor Route would be decommissioned and removed. The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of air pollutant and GHG emissions from the decommissioning process are anticipated to be similar to or less than the emissions generated during the construction phase. Emissions related

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to decommissioning of this potential option would not occur under the Woolsey Canyon Road Route.

3.2 Biological Resources

A database search of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service's (USFWS) critical habitat mapper, and USFWS National Wetlands Inventory were reviewed to determine the potential for sensitive biological resources to be affected by the potential transportation options.

In addition, a biological resource field reconnaissance was conducted by ESA biologists on November 14, 2014, along the Edison Road Truck and Conveyor Routes. The reconnaissance was conducted primarily by vehicle, while select areas along the transportation routes were surveyed on foot to document habitat types (such as at various stream crossings). The North American Cutoff Road, located approximately 1,300 feet east of the North American Cutoff Road Aerial Conveyor, was also surveyed by vehicle, and the habitat types in the vicinity of the existing road were characterized. Aerial maps were used in the field to map primary vegetation communities and identify any sensitive biological resources along Edison Road and North American Cutoff Road. The potential footprints for the North American Cutoff Road Overland Conveyor and Aerial Conveyor Routes, Truck Site 1 and Rail Site 2B, had not yet been established during the field reconnaissance; therefore, potential impacts and suggested due diligence is based on general knowledge of the site acquired during the field reconnaissance, as well as review of aerial maps and databases previously identified. Focused surveys for rare plants or wildlife were not conducted as part of the field reconnaissance.

Based on the field reconnaissance and review of online databases, the transportation routes traverse potentially jurisdictional features and natural vegetation communities, including habitats that are considered sensitive by resource and/or local agencies. These habitats have the potential to support sensitive plants and wildlife species; therefore, once a route is selected and the impact footprint determined, it is recommended that additional biological surveys be conducted on foot to verify the suitability of habitats to support special-status plants and wildlife, and to verify the types of focused surveys that should be conducted prior to any vegetation or land disturbance.

3.2.1 Woolsey Canyon Road Truck Route

The Woolsey Canyon Road Truck Route consists entirely of existing roads and would not require any new construction for use as a haul route. Therefore, use of Woolsey Canyon Road would not result in any new construction or disturbance of undeveloped land. As such, use of the Woolsey Canyon Road Truck Route would result in no additional adverse effects on biological resources. After the construction phase, Woolsey Canyon Road would not be decommissioned and therefore no further biological impacts are anticipated.

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3.2.2 Edison Road Truck Route

This potential option consists of upgrading Edison Road with pavement for use as a primary truck route for hauling soil from the SSFL site to the public roadway system (via Guardian Street to Tapo Canyon Boulevard) to final disposal locations.

Vegetation Communities/Sensitive Habitats and Special-Status Biological Resources

Along the upland slopes adjacent to the truck route, the vegetation communities observed include large expanses of non-native grassland, Venturan coastal sage scrub (CSS), chaparral dominated by chamise (*Adenostoma fasciculatum*), California lilac (*Ceanothus* sp.), and sandstone outcrops. Venturan CSS and sandstone outcrops are considered by Ventura County to be locally important communities and considered by CDFW to be sensitive vegetation communities. Up to 88 acres of vegetation removal could occur in association with land disturbance for development of this truck route. Restoration of Venturan CSS and sandstone outcrops would be required for any temporary or permanent disturbance that would entail preparation and implementation of an approved site-specific restoration plan. Restoration of jurisdictional features/habitats would also require mitigation, as discussed in Potential Jurisdictional Features.

The Venturan CSS and chaparral communities could provide suitable habitat for special-status wildlife and plants such as coastal California gnatcatcher (*Polioptila californica californica*), a federally threatened species; Braunton's milk-vetch (*Astragalus brauntonii*), a federally endangered species; and slender mariposa lily (*Calochortus clavatus* var. *gracilis*), a Ventura County Locally Important Species and rare plant as designated by the California Native Plant Society. Focused surveys for these and other special-status species that could be supported by these natural vegetation communities should be conducted to determine presence. The non-native grassland habitat along this route could provide suitable habitat for mammals such as (but not limited to) mule deer (*Odocoileus hemionus*); blacktailed jackrabbit (*Lepus californicus*), a California Species of Special Concern; and bobcat (*Lynx rufus*). This habitat also supports a variety of rodents such as Los Angeles little pocket mouse (*Perognathus longimembris brevinasus)*, a California Species of Special Concern as well as common species such as the California ground squirrel (*Spermophilus beecheyi*). The vegetation around the Edison Road Truck Route provides nesting habitat for a variety of raptors and other avian species protected under the Migratory Bird Treaty Act (MBTA) of 1918.

The portion of the Arroyo Simi that borders the northern boundary of the Edison Road Truck Route and traverses Truck Site 1 contains Eucalyptus (riparian) woodland that is intermixed with some native upland shrubs (i.e., coyote brush), with adjacent CSS along the upland slopes that are further from the route. The Arroyo Simi is an intermittent stream that has the potential to support special-status aquatic and riparian species such as bank swallow (*Riparia riparia*), arroyo chub (*Gila orcutti*), two-striped garter snake (*Thamnophis hammondii*), and western pond turtle (*Actinemys marmorata*). Impacts to these and other aquatic/riparian species could be avoided through appropriate avoidance and minimization measures such as seasonal work restrictions.

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In addition to Eucalyptus woodland along the Arroyo Simi, Truck Site 1 also supports disturbed CSS and ruderal habitat. This upland vegetation generally includes heavily disturbed, non-native grassland dominated by Russian thistle (*Salsola tragus*), an invasive, non-native species, which, along with the adjacent disturbed CSS which would have a limited potential to provide suitable habitat for special-status wildlife and plants.

In addition, a few scattered oak trees, including scrub oaks (*Quercus berberidifolia*), which are protected by the Ventura County Tree Protection Ordinance, were observed within the aforementioned communities, although they are far enough away from the road that no adverse effects are anticipated. Other trees protected by this ordinance may also occur along this route.

The sandstone outcrops located at the southernmost end of the truck route provide suitable habitat for special-status plant species such as Santa Susana tarplant (*Deinandra minthornii*) and chaparral nolina (*Nolina cismontane*). Unavoidable impacts to rare plants would likely require preparation and implementation of a CDFW-approved restoration plan. In addition, the sandstone outcrops could potentially contain ephemeral depressions that could provide vernal pool habitat and thus support sensitive vernal pool species such as vernal pool fairy shrimp (*Branchinecta lynchi*; federally threatened) or Riverside fairy shrimp (*Streptocephalus woottoni*; federally endangered). If construction results in modification of the sandstone outcrops (such as blasting), these resources could be adversely affected. A habitat assessment for vernal pools and other aquatic features that could support vernal pool branchiopods should be conducted, followed by protocol-level surveys for vernal pool fairy shrimp and Riverside fairy shrimp within areas of habitat deemed suitable during the habitat assessment. If these listed species are determined to be present during protocol-level surveys, consultation with USFWS would be required as well as acquisition of an incidental take permit for any species impacts.

Potential Jurisdictional Features

The Arroyo Simi is a jurisdictional feature that borders the northern boundary of the Edison Road Truck Route and traverses Truck Site 1. No existing roads currently cross the Arroyo Simi from Edison Road, nor do any extend to Guardian Street and Tapo Canyon Road along the fringe of the arroyo from the SSFL site. Therefore, Edison Road would be extended to cross the Arroyo Simi to Tapo Canyon Road. Because the Arroyo Simi is a federal- and state-regulated water course, a permit from the U.S. Army Corps of Engineers (USACE), Los Angeles Regional Water Quality Control Board (LARWQCB), and/or CDFW would be needed prior to any work within the arroyo, including its banks and associated riparian vegetation.

In addition to the Arroyo Simi, an unnamed drainage that is a tributary to the Arroyo Simi is located along the northern portion of the haul route. This ephemeral drainage is dominated by mulefat within the channel and along its banks. A few willows (*Salix* sp.) were observed along this drainage, as well as non-native black mustard (*Brassica nigra*). Because this drainage is tributary to the Arroyo Simi, any work within the channel, including its banks and associated riparian vegetation, would require a permit and subsequent approval from USACE, LARWQCB, and/or CDFW.

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In addition, mitigation should be considered for permanent and/or temporary disturbance to the jurisdictional features, such as onsite restoration and monitoring, or compensatory mitigation.

After the construction phase, Edison Road would be decommissioned and therefore no further biological impacts are anticipated.

3.2.3 Edison Road Overland Conveyor

This potential option consists of installing an overland conveyor along Edison Road that would transport material from SSFL to Truck Site 1, located at the end of Edison Road. At Truck Site 1, soil from SSFL would be loaded into haul trucks, which would transport the material to final disposal locations.

Vegetation Communities/Sensitive Habitats and Special-Status Biological Resources

The vegetation communities observed along the upland slopes immediately surrounding the potential overland conveyor include non-native grassland, Venturan CSS, and chaparral. Sandstone outcrops were observed immediately west of the southern extent of where the conveyor would be constructed. As previously indicated, Venturan CSS and sandstone outcrops are considered by Ventura County to be locally important communities and sensitive vegetation communities by CDFW. Up to 4.7 acres of vegetation removal could occur in association with land disturbance for development of this haul route. Restoration of Venturan CSS and sandstone outcrops would be required for any temporary or permanent disturbance, which would entail preparation and implementation of an approved site-specific restoration plan. Restoration of jurisdictional features/habitats would also require mitigation, as discussed in Potential Jurisdictional Features.

The Venturan CSS, chaparral, non-native grassland communities, Arroyo Simi and associated riparian woodland vegetation, and sandstone outcrops located along the overland conveyor could provide suitable habitat for special-status wildlife and plants, as well as for nesting birds, as previously described. In addition, a few scattered scrub oak trees were observed within some of these habitats and may occur within the overland conveyor route. Other trees protected by the Ventura County Tree Protection Ordinance may also occur along this route, which would require a tree permit from Ventura County and potential mitigation.

After decommissioning is complete, the area would be revegetated using native vegetation.

Potential Jurisdictional Features

As previously described for the Edison Road Truck Route, the Arroyo Simi and the unnamed drainage that is a tributary to the Arroyo Simi, are jurisdictional features, and a permit and approval from USACE, LARWQCB, and/or CDFW would be needed prior to any work within the channel, banks or associated riparian vegetation. In addition, mitigation should be considered for permanent and/or temporary disturbance to the Arroyo Simi and associated riparian vegetation such as onsite restoration and monitoring, or compensatory mitigation.

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3.2.4 North American Cutoff Road Overland Conveyor

This potential option consists of installing an overland conveyor along North American Cutoff Road that would transport material from SSFL to Rail Site 2B, at which point soil would be loaded directly into railcars and transported by rail to another transfer facility (not identified at this time, but assumed to be located near an approved landfill) to be loaded into trucks and transported to final disposal locations.

Vegetation Communities/Sensitive Habitats and Special-Status Biological Resources

Vegetation communities and sensitive habitats in the general vicinity of the North American Cutoff Road Overland Conveyor Route include Venturan CSS, chaparral, and sandstone cliffs/outcrops with varying densities of coastal sage scrub species. Venturan CSS and sandstone outcrops are considered by Ventura County to be locally important communities and are also considered by CDFW to be sensitive vegetation communities. These communities, as well as chaparral, may support special-status wildlife and plants as previously described. However, a biological field survey of this route would be required to verify the suitability of habitats to support special-status species and the need for focused surveys. In addition, trees protected by the Ventura County Tree Protection Ordinance may occur along this route.

Portions of the Arroyo Simi supporting riparian forest vegetation are adjacent to the northern boundary of Rail Site 2B. Because the Arroyo Simi is a state and federally regulated watercourse, a permit from USACE, LARWQCB, and/or CDFW would be needed prior to any work within the channel, or its banks and associated riparian vegetation. As previously discussed, the Arroyo Simi has the potential to support special-status aquatic and riparian species such as bank swallow, arroyo chub, two-striped garter snake, and western pond turtle. Impacts to these and other aquatic/riparian species could be avoided through appropriate avoidance and minimization measures such as seasonal work restrictions. However, as it is unknown if direct or indirect impacts to the Arroyo Simi or riparian forest habitat would occur, and the type of riparian forest habitat has not been determined, potential impacts could occur to federally and state listed species such as least Bell's vireo (*Vireo bellii pusillus*) or southwestern willow flycatcher (*Empidonax traillii extimus*). A biological field survey would be required to determine the suitability of the riparian forest habitat for these and other special-status species.

The central and western portions of Rail Site 2B appear heavily disturbed and dominated by non-native, herbaceous vegetation, interspersed with ornamental trees. The eastern portion of this rail site appears to be dominated by disturbed Venturan CSS interspersed with sandstone outcrops. Ornamental trees, primarily pepper trees (*Schinus* sp.) are located throughout Rail Site 2B and could provide nesting habitat for a variety of raptors and other avian species protected under the MBTA, along with the Venturan CSS habitat. As previously indicated, Venturan CSS and sandstone outcrops are protected communities that may provide suitable habitat for special-status wildlife and plants.

Up to 11.9 acres of vegetation removal could occur in association with land disturbance for development of this haul route. Restoration of Venturan CSS and sandstone outcrops would be

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required for any temporary or permanent disturbance, which would entail preparation and implementation of an approved site-specific restoration plan. Restoration of jurisdictional features/habitats would also require mitigation, as discussed in Potential Jurisdictional Features.

After decommissioning is complete, the area would be revegetated using native vegetation.

Potential Jurisdictional Features

Based on a desktop analysis, it appears that the potential North American Cutoff Road Overland Conveyor transportation route could traverse three potential jurisdictional features (including the Arroyo Simi) that could be under the jurisdiction of USACE, LARWQCB, and/or CDFW and therefore would require a permit from USACE, LARWQCB, and/or CDFW prior to any work within these drainages, or disturbance to any associated riparian vegetation. In addition, mitigation should be considered for permanent and/or temporary disturbance to jurisdictional features such as onsite restoration and monitoring, or compensatory mitigation.

Wildlife Movement Corridor

According to the South Coast Wildlands Missing Linkages Project (2008), the Santa Monica-Sierra Madre Landscape Linkage is a major wildlife corridor that connects the Sierra Madre Ranges of the Los Padres National Forest to the Santa Monica Mountains, and includes the Simi Hills. The North American Cutoff Road Overland Conveyor Route is located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage; therefore, a review of available studies of terrestrial wildlife movement along this route and evaluation of project-related noise generation is recommended to evaluate potential effects on wildlife movement.

3.2.5 North American Cutoff Aerial Conveyor

This potential option consists of installing an aerial conveyor along a portion of North American Cutoff Road that would transport material from SSFL to Rail Site 2B, at which point soil would be loaded directly into railcars and transported by rail to another transfer facility (not identified at this time, but assumed to be located near an approved landfill) to be loaded into trucks and transported to final disposal locations. Because the aerial conveyor requires a linear alignment, this potential option would follow North American Cutoff Road for approximately 2,000 feet and then would deviate from the roadway alignment through undisturbed land for approximately 8,000 feet to Rail Site 2B (see Figure 4).

Vegetation Communities/Sensitive Habitats and Special-Status Biological Resources

Similar to the North American Cutoff Road Overland Conveyor, vegetation communities/habitats in the general vicinity of the aerial conveyor include Venturan CSS, chaparral, and sandstone rock outcroppings with varying densities of coastal sage scrub species. These vegetation communities could provide suitable habitat for special-status wildlife and plants as previously described. A biological field survey of this route would be required to verify the suitability of habitats to support special-status species and the need for focused surveys. Venturan CSS and

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sandstone outcrops are protected vegetation communities. In addition, trees protected by the Ventura County Tree Protection Ordinance may occur along this route.

Up to 14 acres of vegetation removal could occur in association with land disturbance for development of this haul route. Restoration of Venturan CSS and sandstone outcrops would be required for any temporary or permanent disturbance, which would entail preparation and implementation of an approved site-specific restoration plan. Restoration of jurisdictional features/habitats would also require mitigation, as discussed in Potential Jurisdictional Features.

After decommissioning is complete, the area would be revegetated using native vegetation.

Potential Jurisdictional Features

Based on a desktop analysis, it appears that the potential North American Cutoff Road Aerial Conveyor transportation route could traverse two potentially jurisdictional features (including the Arroyo Simi) that could be under the jurisdiction of USACE, LARWQCB, and/or CDFW and therefore would require a permit from USACE, LARWQCB, and/or CDFW prior to any work within these drainages, or disturbance to any associated riparian vegetation. In addition, mitigation should be considered for permanent and/or temporary disturbance to jurisdictional features such as onsite restoration and monitoring, or compensatory mitigation.

Wildlife Movement Corridor

According to the South Coast Wildlands Missing Linkages Project (2008), the Santa Monica-Sierra Madre Landscape Linkage is a major wildlife corridor that connects the Sierra Madre Ranges of the Los Padres National Forest to the Santa Monica Mountains, and includes the Simi Hills. The potential aerial conveyor is located within the eastern strand of the Santa Monica-Sierra Madre Landscape Linkage; therefore, review of available studies of terrestrial wildlife movement along this route and evaluation of project-related noise generation is recommended to evaluate potential effects on wildlife movement.

The vegetation communities and special-status biological resources for Rail Site 2B are the same as those discussed for the North American Cutoff Road Overland Conveyor Route.

3.3 Cultural Resources

A records search at the California Historical Resources Information System was used, in part, to determine the cultural sensitivity of the lands affected by the potential options. Numerous archaeological sites are recorded in the general area of Edison Road and North American Cutoff Road. Given the topography of the project area, it is possible that other unrecorded archaeological sites may exist within the Edison Road and North American Cutoff Road corridors. Systematic Phase I pedestrian archaeological surveys of the selected route, and the significance evaluation of any resources identified—both performed by qualified archaeologists—should be undertaken as part of the environmental review process. Reports should be prepared to document the results of survey and significance evaluation. Any prehistoric archaeological evaluation study would be conducted in consultation with local Native American groups. If a resource is determined to be a historical resource or unique archaeological resource, it should be avoided during construction. If

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avoidance is not feasible, a site mitigation plan or additional protection measures should be developed. Recommendations for monitoring would be formulated based on the results of the pedestrian surveys and significance evaluations.

The Edison Road and North American Cutoff Road are located on geological units with low to high paleontological sensitivity. Because the area in general is considered sensitive for paleontological resources, if a potential option were to be selected, additional work would be necessary to ensure that potential significant paleontological resources are not adversely affected. A paleontological records search should be conducted as part of the environmental review process through the Natural History Museum of Los Angeles County and/or the University of California Berkeley Museum of Paleontology to determine specific paleontological localities within and around the potential option. In addition, a reconnaissance-level site visit should be conducted in areas where there are geological units mapped as having moderate or high sensitivity, and a report documenting the site visit and records search prepared. If sensitive paleontological resources are identified, a treatment plan or protective measures should be developed. Recommendations for monitoring would be formulated based on the results of the site visit and records search results.

3.3.1 Woolsey Canyon Road Truck Route

The Woolsey Canyon Road Truck Route consists entirely of existing roads and would not require any new construction for use as a haul route. Therefore, use of Woolsey Canyon Road would not result in any new construction or disturbance of undeveloped land. As such, use of the Woolsey Canyon Road haul route would result in no additional effects on cultural resources. Impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. Woolsey Canyon Road would not be decommissioned after the project is complete and therefor no further impacts to cultural resources are anticipated.

3.3.2 Edison Road Truck Route

Archaeological Resources

A records search at the California Historical Resources Information System – South Central Coastal Information Center (SCCIC) revealed that there are two archaeological sites (CA-VEN-734 and -1420) and five prehistoric isolated artifacts (P-56-100285, -100295, -100318, -100319, and -100320) within the Edison Road Truck Route.

Site CA-VEN-734 consists of a prehistoric lithic scatter with flakes, lithic tools, fire-cracked rock, fired-cracked manos, and a hammerstone. Based on excavation of test units at the site, the original site record concluded that the site was a “lightly used encampment site” (Pence, 1984). This site has not been evaluated for listing in the National Register of Historic Places (National Register), California Register of Historical Resources (California Register), or local historical register.

Site CA-VEN-1420 consists of an open air small- to medium-density prehistoric lithic scatter, partially disturbed by the installation of multiple aboveground water lines. This site has not been

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evaluated for listing in the National Register, California Register, or local historical register. Isolated artifacts are typically not considered eligible for listing in any register.

Historic topographic maps (1903 Camulos 30-minute USGS topographic map, 1903 and 1942 Santa Susana 15-minute USGS topographic maps, 1903 and 1944 Calabasas 15-minute USGS topographic maps, 1941 Santa Susana 15-minute War Department map, and 1947 Calabasas 15-minute USGS topographic map) and aerial photographs (via historicaerials.com) were reviewed. Edison Road is present on historic topographic maps as early as 1944, and the general vicinity appears undeveloped.

Topography in the vicinity of the Edison Road Truck Route was observed via satellite photos and a reconnaissance-level site visit conducted November 14, 2014. This observation of topography, along with the records search results, was used to infer the archaeological sensitivity of the route.

The majority of Edison Road was observed to generally be quite steep and cut into rocky slopes, making much of it unsuitable for prehistoric or historic human activity. The archaeological sensitivity of these steep areas is considered low. Based on terrain, proximity to water, and presence of previously recorded resources, the southern end of the route and, in particular, the very northern end of the route and Truck Site 1 have a higher archaeological sensitivity. Given the flat topography, the location near water sources at the confluence of Arroyo Simi and the Meier Canyon Creek, the relatively undisturbed state, and the presence of known prehistoric archaeological sites, the northern part of the Edison Road Truck Route and Truck Site 1 should be considered highly sensitive for archaeological resources.

On average, Edison Road Truck Route should be considered moderately sensitive for archaeological resources. However, this is variable across the route, with the southern end, areas with low slope, the northern end, and Truck Site 1 having a higher sensitivity. The great majority (approximately 80 percent) has never been subject to archaeological survey.

Because the area in general is considered sensitive for archaeological resources, if this potential option were to be selected, additional work would be necessary to ensure that potential significant resources are not adversely affected. Two known cultural resources (CA-VEN-734 and -1420) have been recorded within the Edison Road Truck Route and would need to be evaluated for their status as historical resources or unique archaeological resources under CEQA.

Paleontological Resources

The Edison Road Truck Route traverses seven geological units with low to high paleontological sensitivity: the late Cretaceous upper Chatsworth Formation (map unit Kcs; low to moderate sensitivity), the Paleocene lower Santa Susana Formation (Simi Conglomerate) (map unit Tsi; high sensitivity), the Eocene to Paleocene middle Santa Susana Formation (Las Virgenes Sandstone) (map unit Tsuv; high sensitivity), the Eocene to Paleocene upper Santa Susana Formation (map unit Tsu; high sensitivity), the middle Eocene lower and upper Llajas Formation (map units Tllg and Tll; high sensitivity), and Quaternary alluvium (map unit Qa; low sensitivity) (Dibblee, 1992; Dibblee and Ehrenspeck, 1992).

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Impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. Edison Road would be decommissioned after the project is complete and therefor no further impacts to cultural resources are anticipated.

3.3.3 Edison Road Overland Conveyor

Archaeological Resources

The SCCIC records search indicated one previously recorded cultural resource (CA-VEN-734) within the Edison Road Overland Conveyor Route. This resource, a prehistoric archaeological site, is described previously in Section 3.3.2. The historic map review and site reconnaissance indicated the same results as for the Edison Road Truck Route.

The archaeological sensitivity of the Edison Road Overland Conveyor Route is considered the same as for Edison Road Truck Route, described previously (moderately sensitive on average, with the southern end, northern end, Truck Site 1, and areas with low slope having a higher sensitivity).

Because the area in general is considered sensitive for archaeological resources, if this potential option were to be selected, additional work would be necessary to ensure that potential significant resources are not adversely affected. One known cultural resource (CA-VEN-734) has been recorded within the Edison Road Overland Conveyor Route and would need to be evaluated for its status as a historical resource or unique archaeological resource under CEQA.

Paleontological Resources

The Edison Road Overland Conveyor Route traverses seven geological units with low to high paleontological sensitivity: the late Cretaceous upper Chatsworth Formation (map unit Kcs; low to moderate sensitivity), the Paleocene lower Santa Susana Formation (Simi Conglomerate) (map unit Tsi; high sensitivity), the Eocene to Paleocene middle Santa Susana Formation (Las Virgenes Sandstone) (map unit Tsuv; high sensitivity), the Eocene to Paleocene upper Santa Susana Formation (map unit Tsu; high sensitivity), the middle Eocene lower and upper Llajas Formation (map units Tllg and Tll; high sensitivity), and Quaternary alluvium (map unit Qa; low sensitivity) (Dibblee, 1992; Dibblee and Ehrenspeck, 1992).

Impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. During the operations and decommissioning phases it is unlikely that additional resources would be discovered or disturbed.

3.3.4 North American Cutoff Road Overland Conveyor

Archaeological Resources

The SCCIC records search indicated one previously recorded cultural resource (CA-VEN-655) within the North American Cutoff Road Overland Conveyor Route. Site CA-VEN-655 is prehistoric archaeological site consisting of a lithic scatter with fire-affected rock, a projectile point fragment, and a mano fragment. The site is divided into two loci, Locus A and Locus B. Midden to the depth of 60 centimeters was observed at Locus A. Locus B has not been subject to

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subsurface investigation. The site has not been evaluated for listing in the National Register, California Register, or local historical register.

One additional resource (P-56-152383) is located immediately north of, and may extend into, Rail Site 2B. This resource is Corriganville Movie Ranch, the remains of a historic movie filming set, which later became a tourist attraction. The location map included in the site record for this resource is incorrect and does not include the bulk of the historic Corriganville area within the site boundaries. Therefore, although the site record's location map does not depict the site boundaries as overlapping with the Rail Site 2B, a field visit would be necessary to confirm this.

According to the California Office of Historic Preservation (OHP) Historic Property Data File, resource P-56-152383 has been evaluated during four separate project reviews. In two of these reviews, which appear to have been conducted concurrently, the resource was determined eligible for listing in the National Register, and therefore automatically eligible for listing in the California Register. In a subsequent review, the resource was determined not eligible for listing in the National Register. The fourth review resulted in an evaluation being submitted to the OHP, but subsequently withdrawn. The resource is also listed as a Ventura County Historical Landmark (Ventura County, 2004).

Historical map review indicates that the area surrounding much of the route is characterized by steep mountainous terrain and is undeveloped during all periods. Mapped as early as 1903 near the northern terminus of the route, are the Southern Pacific Railroad, Santa Susana Pass Road, and Santa Susana Tunnel. The historic 1903 topographic map depicts the Southern Pacific Railroad and roads corresponding with present-day Kuehner Drive and Smith Road in the vicinity of Rail Site 2B. The railroad and Smith Road, along with an unimproved extension of the road to the east of the railroad, bisect Rail Site 2B. Historic aerial photographs indicate a structure within Rail Site 2B in 1952.

The topography in the vicinity of the North American Cutoff Road Overland Conveyor Route and Rail Site 2B was observed via satellite photos and reconnaissance-level site visits conducted on December 8, 2014, and January 27, 2015. This observation of topography, along with the records search results, was used to infer the archaeological sensitivity of the route.

The northern portion of this route and Rail Site 2B should be considered to have a high sensitivity for both prehistoric and historic-period archaeological resources and built historic resources. A number of prehistoric archaeological sites are recorded in the vicinity, and the northern terminus of the route is located in proximity to water sources. In addition, this area was a significant transportation corridor during the historic period in Southern California. A number of stage and wagon roads, including CA-VEN-896 (described below) crossed the Santa Susana Pass. These roads were constructed in the early 1860s but may have had earlier manifestations dating back to the Spanish Mission period (late 18th to early 19th centuries) (Bevil, 2007).

Leaving Box Canyon Road and travelling southwest along a rocky ridgeline, the route in this area is much less archaeologically sensitive because of the steep topography.

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In general, North American Cutoff Road Overland Conveyor Route should be considered moderately to highly sensitive for cultural resources, with Rail Site 2B, the northern portion of the route, and areas with low slope having a higher sensitivity. All portions of the route have been included in past cultural resources studies; however, some of these studies are outdated.

Because the area in general is considered sensitive for archaeological resources, if this potential option were to be selected, additional work would be necessary to ensure that potential significant resources are not adversely affected. One known cultural resource (CA-VEN-655) has been recorded within this route and would need to be evaluated for its status as a historical resource or unique archaeological resource under CEQA. One additional resource (P-56-152383) is located immediately north of Rail Site 2B and its eligibility and boundaries would need to be further evaluated to confirm its significance and delineate an accurate boundary to confirm if it extends into Rail Site 2B.

Paleontological Resources

The North American Cutoff Road Overland Conveyor Route crosses three geological units of low to high paleontological sensitivity: the upper Chatsworth Formation (map unit Kcsh; low to moderate sensitivity), the lower Chatsworth Formation (map unit Kcs; moderate to high sensitivity), and Quaternary alluvium (map unit Qa; low sensitivity) (Dibblee, 1992; Dibblee and Ehrenspeck, 1992). Impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. During the operations and decommissioning phases it is unlikely that additional resources would be discovered or disturbed.

3.3.5 North American Cutoff Road Aerial Conveyor

Archaeological Resources

The SCCIC records search indicated that three archaeological sites, CA-VEN-655, -729 and -896, are located within the North American Cutoff Road Aerial Conveyor Route. Site CA-VEN-655 is a prehistoric site, described previously under North American Cutoff Road Overland Conveyor. Site CA-VEN-729 consists of a lithic scatter with quartzite and fused shale flakes located on a knoll. CA-VEN-896 is a historic-period segment of a wagon road (the “Old Freight Road”) with an unmortared native sandstone rock retaining wall and natural rock culverts. None of the sites has been evaluated for listing in the National Register, California Register, or local historical register.

The historic map review and site reconnaissance indicated the same results for this route as for the North American Cutoff Road Overland Conveyor.

The archaeological sensitivity of the North American Cutoff Road Aerial Conveyor Route is considered the same as for North American Cutoff Road Overland Conveyor, described previously (moderately to highly sensitive, with the northern end of the route, Rail Site 2B, and areas with low slope having the highest sensitivity and lesser sensitivity south of Box Canyon Road).

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Three known cultural resources (CA-VEN-655, -729 and -896) have been recorded within the route and would need to be evaluated for their status as historical resources or unique archaeological resources under CEQA.

Paleontological Resources

The North American Cutoff Road Aerial Conveyor Route crosses three geological units with low to high paleontological sensitivity: the upper Chatsworth Formation (map unit Kcsh; low to moderate sensitivity), the lower Chatsworth Formation (map unit Kcs; moderate to high sensitivity), and Quaternary alluvium (map unit Qa; low sensitivity) (Dibblee, 1992; Dibblee and Ehrenspeck, 1992). Impacts to any cultural or paleontological resources would likely occur during the construction phase when the soil surface is initially disturbed. During the operations and decommissioning phases it is unlikely that additional resources would be discovered or disturbed.

3.4 Energy Consumption

Fuel consumption was estimated for each potential option using traffic trip generation rates, CalEEMod construction equipment mix (provided in Appendix C) and usage data and anticipated construction and operations schedules. Electricity usages for the conveyor routes were determined using manufacturer specifications for required electricity to power the conveyor systems and the anticipated operations schedule. It was assumed that operations would occur during daylight hours only and that night lighting would not be required. The energy usage data sheet is provided in Appendix D.

3.4.1 Woolsey Canyon Road Truck Route

The Woolsey Canyon Road Truck Route would not require any new construction. Therefore, energy consumption would occur during the operational phase only. Operation of the Woolsey Canyon Road Truck Route would result in a maximum of 96 trucks daily for export and import of materials (resulting in 192 total daily trips). This would result in approximately 1,404,364 gallons of diesel consumed per year during operations. Because diesel-fueled trucks would be the only transportation technology used under this potential option, it is assumed that the Woolsey Canyon Road Truck Route would not require additional electricity for operations Woolsey Canyon Road would not be decommissioned after the project is complete so no additional energy consumption impacts are expected to occur after the operational phase.

3.4.2 Edison Road Truck Route

Construction of the Edison Road Truck Route and Truck Site 1 is estimated to consume a total of 478,287 gallons of diesel and 17,962 gallons of gasoline.

Operation of the Edison Road Truck Route would result in a maximum of 96 trucks daily for export and import of materials (resulting in 192 total daily trips). This would result in approximately 1,414,329 gallons of diesel consumed per year. Because diesel-fueled trucks would be the only transportation technology used under this potential option and operations

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would occur during daylight hours only, it is assumed that the Edison Road Truck Route would not require additional electricity for operations.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of electricity, diesel and gasoline from the decommissioning process is anticipated to be similar to or less than that estimated for the construction phase.

3.4.3 Edison Road Overland Conveyor

Construction equipment used to construct the Edison Road Overland Conveyor and Truck Site 1 would require a total of 175,323 gallons of diesel and 10,291 gallons of gasoline.

Operation of the Edison Road Overland Conveyor would be powered by electricity and would therefore not require diesel or gasoline fuel. Hauling material from Truck Site 1 would result in a maximum of 96 trucks daily for export of materials (resulting in 192 total daily trips). This would result in approximately 1,414,329 gallons of diesel consumed per year.

The overland conveyor would require approximately 2,620 kW to operate, for a total of approximately 440,160 kWh/month (assuming 8 hours per day and 21 days a month).

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of electricity, diesel and gasoline from the decommissioning process is anticipated to be similar to or less estimated for the construction phase.

3.4.4 North American Cutoff Road Overland Conveyor

Construction equipment used to construct the North American Cutoff Road Overland Conveyor and associated Rail Site 2B would require a total of 96,545 gallons of diesel and 8,307 gallons of gasoline.

Operation of the North American Cutoff Road Overland Conveyor would be powered by electricity and would therefore not require diesel or gasoline fuel. Fuel consumption would be dependent on fuel requirements for haul trucks and freight trains. Haul trucks used for this potential option are estimated to consume 372,092 gallons of diesel per year. Freight train hauling would consume approximately 2,746,213 gallons of diesel per year.

The overland conveyor would require approximately 2,620 kW to operate, for a total of approximately 440,160 kWh/month (assuming 8 hours a day and 21 days a month).

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of electricity, diesel and gasoline from the decommissioning process is anticipated to be similar to or less than estimated for the construction phase.

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3.4.5 North American Cutoff Road Aerial Conveyor

Construction equipment used to construct the North American Cutoff Road Aerial Conveyor and associated Rail Site 2B would require a total of 82,573 gallons of diesel and 10,241 gallons of gasoline.

Operation of the North American Cutoff Road Aerial Conveyor would be powered by electricity and would therefore not require diesel or gasoline fuel. Fuel consumption would be dependent on fuel requirements for haul trucks and freight trains. Haul trucks used for this potential option are estimated to consume 372,092 gallons of diesel per year. Freight train hauling would consume approximately 2,746,213 gallons of diesel per year.

The aerial conveyor would require approximately 351 kW to operate, for a total of 58,968 kWh/month (assuming 8 hours a day and 21 days a month).

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the quantity of electricity, diesel and gasoline from the decommissioning process is anticipated to be similar to or less than estimated for the construction phase.

3.5 Land Use Compatibility

Land use was analyzed based on the compatibility of all components of the potential options with the allowable uses established for the applicable local General Plan land use designations and zoning code. The General Plans and zoning code for Ventura County, Los Angeles County, and City of Simi Valley were reviewed in preparation of this analysis.

3.5.1 Woolsey Canyon Road Truck Route

The Woolsey Canyon Road Truck Route is located in Ventura and Los Angeles County and crosses a variety of land use designations and zones, including Residential, Commercial, Industrial, Manufacturing, Open Space, Public Facilities, and Transportation Corridor. The route is currently operating as a paved roadway system. No changes to the current land use or zoning would be needed to use this route.

3.5.2 Edison Road Truck Route

The Edison Road Truck Route is located within the city of Simi Valley and unincorporated Ventura County. Surrounding land uses include undeveloped land and residential communities.

Table 3-19 identifies the applicable General Plan land use designations and zoning.

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TABLE 3-19
EDISON ROAD TRUCK ROUTE LAND USE DESIGNATIONS AND ZONING

Jurisdiction	Land Use Designation	Zoning
Ventura County	Open Space	Open Space (OS-160ac)
		Rural Agriculture (RA-5ac)
City of Simi Valley	Open Space	Open Space
		Water Storage Facility
	Medium Density Residential	Residential (Medium Density)
	Business Park	BP - Business Park

The Edison Road Truck Route would be located on lands designated as Open Space in the Ventura County General Plan. It would also cross lands designated as Open Space, Medium Density Residential, and Business Park in the Simi Valley General Plan. The following table identifies the Edison Road Truck Route's consistency with the goals and policies identified for Open Space designated areas in the Ventura County General Plan and Simi Valley General Plan. Note that the Simi Valley General Plan does not contain goals and policies for Residential or Business Park designated areas that are applicable to implementation of this potential option. As shown in **Table 3-20**, the Edison Road Truck Route could be consistent with the land use goals and policies of the Ventura County General Plan and Simi Valley General Plan.

TABLE 3-20
EDISON ROAD TRUCK ROUTE CONSISTENCY WITH VENTURA COUNTY AND SIMI VALLEY GENERAL PLAN GOALS AND POLICIES

Goals and Policies	Consistency
Ventura County General Plan Open Space Goals:	
(3) Retain open space lands in a relatively undeveloped state so as to preserve the maximum number of future land use options.	**Consistent:** This potential option would improve an existing dirt road. Open space lands would remain in a relatively undeveloped state which would preserve the maximum number of future land use options. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
(4) Retain open space lands for outdoor recreational activities, parks, trails and for scenic lands.	**Consistent:** This potential option would improve an existing dirt road. Open space lands would remain in a relatively undeveloped state which would retain the lands for outdoor recreation activities, parks, trails and for scenic lands. This potential transportation option may incrementally diminish the natural character of the area by construction and operation of a truck route. However, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
Ventura County General Plan Open Space Policies:	
(1) Open Space should include areas of land or water which are set aside for the preservation of natural resources, including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and important watershed lands.	**Consistent:** This potential transportation option would improve an existing dirt road and would allow for the continued preservation of natural resources. This potential transportation option may adversely affect natural resources within the construction footprint of the route. However, the route would not be constructed on lands that are set aside for preservation. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.

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Goals and Policies	Consistency
(2) Open Space should also include areas set aside for managed production of resources, including, but not limited to, forest lands, rangeland, agricultural lands not otherwise designated Agricultural; areas required for the recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.	**Consistent:** This potential transportation option would improve an existing dirt road and would not preclude the managed production of resources in the area.
(3) Open Space should also include areas within which recreational activities can be pursued, including, but not limited to, areas of outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.	**Consistent:** This potential transportation option would improve an existing road would continue to allow recreational activities. This potential transportation option may adversely affect recreation activities within the construction footprint of the route. However, the route would not be constructed on lands that are particularly suited for park and recreation purposes. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
Simi Valley General Plan GOAL LU-6: Open Space	
Open Spaces. Open space lands are preserved to maintain the visual quality of the City, provide opportunities, protect the public from safety hazards, and conserve natural resources and wildlife.	**Consistent:** This potential transportation option would improve an existing dirt road and would maintain the open space resources in the City. This potential transportation option may incrementally diminish the natural character of the area by construction and operation of a truck route. However, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete. Overall, this route would not significantly diminish open space character of the area.
Simi Valley General Plan Policies: Open Space	
LU-6.1 Scenic and Natural Areas. Provide for the preservation of significant scenic areas and corridors, plant and animal habitat, riparian areas, and significant geologic features within the City.	**Consistent:** This potential transportation option would improve an existing dirt road and would not substantially affect scenic areas and corridors, plant and animal habitat, riparian areas, and significant geologic features within the city of Simi Valley. This potential transportation option may incrementally diminish the natural character of the area by construction and operation of a truck route. However, the route would not be constructed on lands that are set aside for preservation. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
LU-6.2 Mature Trees. Continue to sustain mature trees, which are an integral part of the City's character.	**Consistent:** This potential transportation option would improve an existing dirt road and would be designed to avoid mature trees to the greatest extent feasible.
LU-6.3 Creeks and Natural Drainages. Maintain and improve the form and health of resources and habitat in the City's natural drainages. Explore restoration of those that have been degraded or channelized, such as the Arroyo Simi, as feasible, while continuing to maintain stormwater conveyance and property protection requirements.	**Consistent:** This potential transportation option would improve an existing dirt road and would be designed to reduce disturbance to natural drainages. This potential option would also require permits from CDFW and USFWS due to potential disturbance of the Arroyo Simi. Obtainment and compliance with the permits would ensure that effects on natural drainages are mitigated.
LU-6.4 Night Sky. Reduce the impacts of ambient outdoor lighting on the darkness of the night sky.	**Consistent:** This potential transportation option would not require night lighting.

The use of Edison Road as a haul road for contaminated material is not explicitly identified among the permitted uses in the Open space and Rural Agriculture zones in Ventura County. However, the haul road may be considered an accessory use. The principal use of the Edison Road Truck Route would be to haul contaminated soil from SSFL to the public roadway system via Edison Road to Guardian Street.

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The Simi Valley Zoning Ordinance also does not explicitly identify haul roads among the permitted uses in the Open Space, Residential, Water Storage Facility, and Business Park zones. However, the City may consider the haul road to be an access road, which could be an allowable use within these zones. Reasonably similar uses that also involve hazardous wastes such as motor vehicles and transportation equipment, solid waste disposal facilities and transmission/ distribution pipelines and surface facilities are allowed in this zone. Overall, implementation of the Edison Road Truck Route within Open Space, Residential, Water Storage Facility, and Business Park zones may be a compatible use and further discussion with the City of Simi Valley planning department must take place to determine whether implementation of the Edison Road Truck Route would be allowable.

3.5.3 Edison Road Overland Conveyor

The Edison Road Overland Conveyor Route is located within the City of Simi Valley and unincorporated Ventura County. Surrounding land uses include undeveloped land and residential communities of Simi Valley.

Table 3-21 identifies the applicable General Plan land use designations and zoning.

TABLE 3-21
EDISON ROAD CONVEYOR ROUTE LAND USE DESIGNATIONS AND ZONING

Jurisdiction	Land Use Designation	Zoning Designation
Ventura County	Open Space	Open Space (OS-160ac; OS-160ac/MRP)
City of Simi Valley	Open Space	Open Space
	Business Park	Business Park

NOTE: MRP: Mineral Resources Protection Overlay Zone

The Edison Road Overland Conveyor would be located on lands designated as Open Space in the Ventura County General Plan. It would also cross lands designated as Open Space and Business Park in the Simi Valley General Plan. The following table identifies the Edison Road Overland Conveyor's consistency with the goals and policies identified for Open Space designated areas in the Ventura County General Plan and Simi Valley General Plan. Note that the Simi Valley General Plan does not contain goals and policies for Business Park designated areas that are applicable to implementation of this potential transportation option. As shown in **Table 3-22**, the Edison Road Overland Conveyor could be consistent with the land use goals and policies of the Ventura County General Plan and Simi Valley General Plan.

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TABLE 3-22
EDISON ROAD CONVEYOR ROUTE CONSISTENCY WITH VENTURA COUNTY AND SIMI VALLEY GENERAL PLAN GOALS AND POLICIES

Goals and Policies	Consistency
Ventura County General Plan Open Space Goals:	
(3) Retain open space lands in a relatively undeveloped state so as to preserve the maximum number of future land use options.	**Consistent:** This potential transportation option would have limited permanent ground disturbance. Open space lands would remain in a relatively undeveloped state which would preserve the maximum number of future land use options. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete
(4) Retain open space lands for outdoor recreational activities, parks, trails and for scenic lands.	**Consistent:** This potential transportation option would have limited permanent ground disturbance. Open space lands would remain in a relatively undeveloped state which would retain the lands for outdoor recreation activities, parks, trails and for scenic lands. This potential transportation option may incrementally diminish the natural character of the area by construction and operation of a overland conveyor. However, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
Ventura County General Plan Open Space Policies:	
(1) Open Space should include areas of land or water which are set aside for the preservation of natural resources, including, but not limited to, areas required for the preservation of plant and animal life, including habitat for fish and wildlife species; areas required for ecologic and other scientific study purposes; rivers, streams, bays, and estuaries; and coastal beaches, lakeshores, banks of rivers and streams, and important watershed lands.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would allow for the continued preservation of natural resources. This potential transportation option may adversely affect natural resources within the construction footprint of the route. However, the route would not be constructed on lands that are set aside for preservation. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
(2) Open Space should also include areas set aside for managed production of resources, including, but not limited to, forest lands, rangeland, agricultural lands not otherwise designated Agricultural; areas required for the recharge of groundwater basins; bays, estuaries, marshes, rivers, and streams which are important for the management of commercial fisheries; and areas containing major mineral deposits, including those in short supply.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would allow for the continued managed production of resources.
(3) Open Space should also include areas within which recreational activities can be pursued, including, but not limited to, areas of outstanding scenic, historic, and cultural value; areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas which serve as links between major recreation and open space reservations, including utility easements, banks of rivers and streams, trails, and scenic highway corridors.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would continue to allow recreational activities. This potential transportation option may adversely affect recreation activities within the construction footprint of the route. However, the route would not be constructed on lands that are particularly suited for park and recreation purposes. In addition, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete.
Simi Valley General Plan GOAL LU-6: Open Space	
Open Spaces. Open space lands are preserved to maintain the visual quality of the City, provide opportunities, protect the public from safety hazards, and conserve natural resources and wildlife.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would maintain the open space resources in the City. This potential transportation option may incrementally diminish the natural character of the area by construction and operation of an overland conveyor. However, this potential transportation option is temporary and would be decommissioned after cleanup activities are complete. Overall, this route would not significantly diminish open space character of the area.

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Goals and Policies	Consistency
Simi Valley General Plan Policies: Open Space	
LU-6.1 Scenic and Natural Areas. Provide for the preservation of significant scenic areas and corridors, plant and animal habitat, riparian areas, and significant geologic features within the City.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would not be capable of significantly affecting scenic areas and corridors, plant and animal habitat, riparian areas, and significant geologic features within the City. Any work within the channel, banks or associated riparian vegetation of a drainage feature would require a permit and approval from USACE, LARWQCB, and/or CDFW prior to construction. Obtainment and compliance with the permit would ensure mitigation for any adverse effects on riparian vegetation.
LU-6.2 Mature Trees. Continue to sustain mature trees, which are an integral part of the City's character.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would be designed to avoid mature trees to the greatest extent feasible.
LU-6.3 Creeks and Natural Drainages. Maintain and improve the form and health of resources and habitat in the City's natural drainages. Explore restoration of those that have been degraded or channelized, such as the Arroyo Simi, as feasible, while continuing to maintain stormwater conveyance and property protection requirements.	**Consistent:** This potential transportation option would have limited permanent ground disturbance and would be designed to reduce adverse effects on natural drainages. Any work within the channel, banks or associated riparian vegetation of a drainage feature would require a permit and approval from USACE, LARWQCB, and/or CDFW prior to construction. Obtainment and compliance with the permit would ensure mitigation for any adverse effects on natural drainages.
LU-6.4 Night Sky. Reduce the impacts of ambient outdoor lighting on the darkness of the night sky.	**Consistent:** This potential transportation option would not require night lighting.

The Ventura County Zoning Ordinance allows the construction of pipelines, transmission lines, and aboveground facilities in Open Space Zones with obtainment of a Conditional Use Permit. The Edison Road Overland Conveyor may be categorized under this use. In addition, hazardous waste collection, treatment, and storage facilities are allowed in the Open Space zones in Ventura County with obtainment of a zoning clearance, or other ministerial approved permit.

The Simi Valley Zoning Ordinance allows the construction of pipelines, transmission lines, and aboveground facilities within the Open Space and Business Park zones through obtainment of a Conditional Use Permit. However, the Open Space Zone does not list hazardous waste collection, treatment, and storage facilities among the allowable uses. However, reasonably similar uses that also involve hazardous wastes such as oil and gas exploration and extraction and mining are allowed in the Open Space Zone with obtainment of a Conditional Use Permit. Truck Site 1 is located within the Business Park zone which also does not list hazardous waste collection, treatment and storage facilities among the allowable uses. However, reasonably similar uses that also involve hazardous wastes such as motor vehicles and transportation equipment, solid waste disposal facilities and transmission/distribution pipelines and surface facilities are allowed in this zone. Overall, further discussion with the City of Simi Valley planning department must take place to determine whether implementation of the Edison Road Overland Conveyor would be allowable.

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3.5.4 North American Cutoff Road Overland Conveyor

This route is located within unincorporated Ventura County. Surrounding land uses include undeveloped land, including Sage Ranch Park, as well as the community of Santa Susana. **Table 3-23** identifies the applicable General Plan land use designations and zoning.

TABLE 3-23
NORTH AMERICAN CUTOFF ROAD CONVEYOR ROUTE LAND USE DESIGNATIONS AND ZONING

Jurisdiction	Land Use Designation	Zoning Designation
Ventura County	Open Space (10 ac min.)	Agricultural Exclusive (AE-40ac)
		Open Space (OS-160ac; OS-40ac; OS-10ac; OS-20ac)
	Existing Community (Santa Susana)[a]	Residential Estate (RE-10,000 sf

[a]. Fig 3.22a of Ventura County General Plan policies chapter

The North American Cutoff Road Overland Conveyor would be located on lands designated as Open Space and Existing Community in the Ventura County General Plan. Table 3-22, as shown under the land use discussion for the Edison Road Overland Conveyor, identifies the overland conveyor's consistency with the goals and policies identified for Open Space designated areas in the Ventura County General Plan. The consistency analysis presented in Table 3-22 is also applicable to the North American Cutoff Road Overland Conveyor because the same use and technology is being considered under this potential option. Please note that the Ventura County General Plan does not contain goals and policies for the Existing Community designation that are applicable to implementation of the North American Cutoff Road Overland Conveyor. As shown in Table 3-22, the North American Cutoff Road Overland Conveyor would be consistent with the land use goals and policies of the Ventura County General Plan.

The Ventura County Zoning Ordinance allows the construction of pipelines, transmission lines, and aboveground facilities within the Open Space, Agricultural Exclusive, and Residential Estate zones through obtainment of a Conditional Use Permit. The North American Cutoff Road Overland Conveyor may be categorized under this use. In addition, hazardous waste collection, treatment, and storage facilities are allowed in the Open Space, Agricultural Exclusive, and Residential Estate zones in Ventura County through obtainment of a zoning clearance, or other ministerial approved permit.

Rail Site 2B is located within the city of Simi Valley. Surrounding land uses include Corrigan Regional Park, as well as industrial yards and commercial businesses. **Table 3-24** identifies the applicable General Plan land use designations and zoning.

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TABLE 3-24
RAIL SITE 2B LAND USE DESIGNATIONS AND ZONING

Jurisdiction	Land Use Designation	Zoning Designation
City of Simi Valley	Community Park	Open Space
	Commercial Recreation	Commercial Recreation
	Industrial	Light Industrial

Rail Site 2B is located on lands that are designated as Community Park, Commercial Recreation, and Industrial in the Simi Valley General Plan. There are no goals and polices for Community Park, Commercial Recreation, and Industrial designated areas that are applicable to implementation of Rail Site 2B. However, the purposes of Community Park areas are described as follows in the Simi Valley General Plan:

> *Community parks are major facilities designed to satisfy the widest spectrum of interests. In general, they are "drive-to" centers where families or organizations can find a sufficient variety of activities and opportunities, including community centers, to occupy several hours or an entire day. Community parks also provide specific or single-purpose recreational activities and amenities, such as a historical park, equestrian center, or dog park, and may draw users from surrounding communities. Community parks generally range in size from a minimum of 20 acres to 200 acres or more, depending on type and location. Themed community parks frequently entail greater space requirements than do urban, multi-purpose parks.*

Based on the established purpose of Community Park designated areas in the Simi Valley General Plan, the construction of Rail Site 2B, a hazardous waste storage facility/rail yard, may not be compatible with Community Park designated areas, which serve to provide recreational opportunities for the community. Further discussion with the City of Simi Valley must take place to determine if implementation of Rail Site 2B would be a compatible use with the Simi Valley General Plan.

The City of Simi Valley Zoning Map shows that Rail Site 2B would be located within Open Space, Commercial Recreation, and Light Industrial zones. The Open Space zone does not identify hazardous waste storage/transfer facilities and railroad facilities among the allowable uses in this zone. In addition, railroad facilities are not allowed in the Commercial and Light Industrial zones; therefore, a zone change would need to be requested from the City of Simi Valley in order to allow development of Rail Site 2B.

3.5.5 North American Cutoff Road Aerial Conveyor

This route is located within unincorporated Ventura County. Surrounding land uses include undeveloped land, Sage Ranch Park, as well as the community of Santa Susana. Table 3-24, presented in Section 3.5.4 identifies the applicable General plan land use designations and zoning for the North American Cutoff Road Aerial Conveyor Route.

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The North American Cutoff Road Aerial Conveyor would be located on lands designated as Open Space in the Ventura County General Plan. Table 3-22, as shown under the land use discussion for the Edison Road Overland Conveyor, identifies the overland conveyor's consistency with the goals and policed identified for Open Spaced designated areas in the Ventura County General Plan. While the aerial conveyor technology would result in a greater quantity of land disturbance than the overland conveyor option, the aerial conveyor's land disturbance would still be considered minimal, as only 10 support towers would be required over 3.1 miles. This would maintain the rural, undisturbed character of Open Space designated areas. As such, the consistency analysis presented in Table 3-22 is also applicable to the North American Cutoff Road Aerial Conveyor. As shown in Table 3-22, this potential option would be consistent with the land use goals and policies of the Ventura County General Plan.

The Ventura County Zoning Ordinance allows the construction of pipelines, transmission lines, and aboveground facilities within the Open Space and Agricultural Exclusive zones through obtainment of a Conditional Use Permit. The North American Cutoff Road Aerial Conveyor may be categorized under this use. In addition hazardous waste collection, treatment, and storage facilities are allowed in the Open Space and Agricultural Exclusive zones in Ventura County through obtainment of a zoning clearance, or other ministerial approved permit. Per *Section 8106-1.1-Development Standards for Uses and Structures in OS, AE and R Zones*, the maximum structure height for principal structures is 25 feet. Under an exception, the height may be increased above 25 feet to 35 feet with 15-foot setbacks on either side, or as specified by permit. This poses a potential conflict for the aerial conveyor technology as the support tower heights would range between 40 and 120 feet. The RPs would need to request a Conditional Use Permit from with Ventura County as part of the environmental review and permitting process to ensure that implementation of the North American Cutoff Road Aerial Conveyor would be an allowable use in Open Space and Agricultural Exclusive zones.

Rail Site 2B is located within the city of Simi Valley. Surrounding land uses include Corrigan Regional Park, as well as industrial yards and commercial businesses. Table 3-24, presented in Section 3.5.4 identifies the applicable General Plan land use designations and zoning for Rail Site 2B.

Rail Site 2B is located on lands that are designated as Community Park, Commercial Recreation, and Industrial in the Simi Valley General Plan. There are no goals and polices for Community Park, Commercial Recreation and Industrial designated areas that are applicable to implementation of Rail Site 2B. However, the purpose of Community Park areas is described as follows in the Simi Valley General Plan:

> *Community parks are major facilities designed to satisfy the widest spectrum of interests. In general, they are "drive-to" centers where families or organizations can find a sufficient variety of activities and opportunities, including community centers, to occupy several hours or an entire day. Community parks also provide specific or single-purpose recreational activities and amenities, such as a historical park, equestrian center, or dog park, and may draw users from surrounding communities. Community parks generally range in size from a*

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minimum of 20 acres to 200 acres or more, depending on type and location. Themed community parks frequently entail greater space requirements than do urban, multi-purpose parks.

Based on the established purpose of Community Park designated areas in the Simi Valley General Plan, the construction of Rail Site 2B, a hazardous waste storage facility/rail yard, may not be compatible with Community Park designated areas, which serve to provide recreational opportunities for the community. Coordination with the City of Simi Valley would be necessary to determine if implementation of Rail Site 2B would be compatible with the Simi Valley General Plan.

The City of Simi Valley Zoning Map shows that Rail Site 2B would be located within Open Space, Commercial Recreation, and Light Industrial zones. The Open Space zone does not identify hazardous waste storage/transfer facilities and railroad facilities among the allowable uses in this zone. In addition, railroad facilities are not allowed in the Commercial and Light Industrial zones. Further discussion with the City of Simi Valley must take place to determine if implementation of Rail Site 2B would be allowable in the Open Space, Commercial Recreation, and Light Industrial zones.

3.6 Noise

The construction and operation of all analyzed transport routes would generate noise levels that could potentially disturb nearby noise-sensitive uses that are located in proximity to the route paths. Noise sensitive land uses are defined as those specific land uses that have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by other sound sources in the environment. Based on the Ventura County General Plan, land uses considered to be noise-sensitive uses include residential, educational, and health facilities, research institutions, certain recreational and entertainment facilities (typically, indoor theaters and parks for passive activities), and churches. In addition, the construction of the potential transport routes would also generate groundborne vibration levels resulting from the operation of heavy off-road equipment. Sensitive receptors for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration sensitive equipment.

Based on a review of the potential transport route locations, the nearest sensitive land uses to these routes include primarily single-family residences that are located in unincorporated Ventura County and the city of Simi Valley. The only other non-residential sensitive land use in the area is the American Jewish University, which is located in unincorporated Ventura County. As such, for the purpose of this analysis, the construction and operational noise levels associated with the potential transport routes are assessed against the noise standards and regulations of the applicable jurisdiction (i.e., County of Ventura or City of Simi Valley) depending on the location of the nearest sensitive receptors to each of the transport routes. The noise levels used to evaluate the noise levels from the overland and aerial conveyors were taken from information provided by firms that construct these systems. The noise levels at the nearest sensitive receptors to each of the transport routes were estimated based on their distance from the construction areas. For the

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groundborne vibration analysis, the vibration levels resulting from construction activities for the potential transport routes were estimated using data published by the FTA in its *Transit Noise and Vibration Impact Assessment* (FTA, 2006) document. Similar to the noise assessment, potential vibration levels resulting from construction activities were identified for offsite sensitive receptors based on their distance from construction activities. The potential vibration levels at offsite sensitive locations resulting from implementation of the potential transport routes were analyzed against the vibration thresholds established by the FTA to determine whether an exceedance of allowable vibration levels would occur.

Prior to evaluating the noise and groundborne vibration effects on sensitive receptors located in proximity to each of the potential transport routes, a brief introduction to the noise and vibration descriptors that would be used in this analysis are provided below.

Noise and Vibration Descriptors

Noise levels are measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound. Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Because the typical human ear is not equally sensitive to all frequencies of the audible sound spectrum, when assessing potential noise impacts sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. All noise levels presented in this feasibility analysis are A-weighted unless otherwise stated. Additionally, the noise descriptors presented in this analysis include the equivalent sound level (L_{eq}), which is used to describe noise over a specified period of time in terms of a single numerical value (the L_{eq} may also be referred to as the average sound level) and the community noise equivalent level (CNEL), which is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dBA to measured noise levels between the hours of 7:00 P.M. to 10:00 P.M. and after an addition of 10 dBA to noise levels between the hours of 10:00 P.M. to 7:00 A.M. to account for noise sensitivity in the evening and nighttime, respectively.

With respect to groundborne vibration, the effects could include building damage and human annoyance. There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body (i.e., annoyance). The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS and acts to compress the range of numbers required to describe vibration. The relationship of PPV to RMS velocity is

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expressed in terms of the "crest factor," defined as the ratio of the PPV amplitude to the RMS amplitude. PPV is typically a factor of 1.7 to 6 times greater than RMS vibration velocity.

3.6.1 Woolsey Canyon Road Truck Route

The Woolsey Canyon Road Truck Route consists entirely of existing roads and would not require new construction for use as a haul route. As part of the overall site cleanup, a maximum of 96 trucks would visit the site for export and import of materials (resulting in 192 total trips). Soil haul trucks entering and leaving the SSFL site would need to travel on Woolsey Canyon Road. As such, the existing residential homes of the Summit Mobile Home Community would be exposed to increased traffic noise levels from these haul trucks as well as from construction worker vehicles.

To assess potential traffic-related noise impacts resulting from the SSFL project, the traffic noise levels generated by the peak hour traffic volumes on the 12 local roadway segments analyzed in the SSFL project traffic study under the "future with project" conditions were compared to those under the "future without project" conditions.

The peak hour estimated roadway noise on the 12 roadway segments analyzed in the SSFL cleanup traffic study under the scenario with a maximum of 96 daily haul trucks is shown in **Table 3-25**.

As shown in Table 3-25, with the exception of the roadway segment of Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road, and the segment of Facility Road extending from the SSFL site entrance to Woolsey Canyon Road, all of the study roadway segments would experience increases in peak hour noise levels of less than 5 dBA over future baseline conditions under the scenario where a maximum of 192 daily truck trips would occur under the project. Thus, traffic noise levels on these roadways would not be readily perceptible. However, because the addition of the SSFL cleanup-related haul truck and worker vehicle trips would increase the peak hour noise levels on Woolsey Canyon Road and Facility Road by 7.8 dBA L_{eq} and 5.0 dBA L_{eq}, respectively, a potential impact related to a substantial increase in noise levels above ambient conditions would occur on these roadway segments. The traffic noise increase on this roadway is due to Woolsey Canyon Road being the designated access point to the project site by the project's construction-related traffic. Due to the low volume of vehicles that currently travel on this roadway, the addition of the project's daily 192 truck trips along with worker trips would result in a readily perceptible increase in noise levels on this roadway. Because the increase in traffic noise levels on Woolsey Canyon Road and Facility Road would be a direct result of the project's traffic, mainly due to the haul trucks, mitigation would be required. Construction of noise barriers along Facility Road and Woolsey Canyon Road would mitigate these significant noise impacts, however, it may not be feasible, practical, or acceptable to construct a noise barrier for the duration of the project, due to potential objections by property owners and other constraints. It should be noted, that the 192 total daily truck trips would only occur on peak construction days, while on most days, a smaller number of trucks would be used to transport materials to and from the project site. Nonetheless, on peak construction days when

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the maximum number of 192 truck trips travel to and from the project site, a substantial increase in traffic noise levels on these roadways would occur.

TABLE 3-25
PEAK HOUR ROADWAY NOISE LEVELS WITH PROJECT – MAXIMUM (96) HAUL TRUCKS

	Noise Levels in dBA L_{eq} (hourly)[a]				
Roadway Segment	**Baseline (2015) Traffic Volumes**	**Future (2038) With Project Traffic Volumes**	**Increase**	**Significance Threshold[b]**	**Exceeds Threshold?**
Box Canyon Road, between Santa Susana Pass Road and Roberson Road	55.5	56.6	1.1	3.0	No
Santa Susana Pass Road, between Rocky Peak Road and Box Canyon Road	54.1	55.2	1.1	3.0	No
Woolsey Canyon Road, between Valley Circle Boulevard and Knapp Ranch Road	54.7	62.5	7.8	5.0	Yes[d]
Valley Circle Boulevard, between Box Canyon Road and Woolsey Canyon Road	55.6	57.0	1.4	5.0	No
Valley Circle Boulevard, between Plummer Street and Schumann Road	59.4	60.8	1.2	5.0	No
Plummer Street, between Valley Circle Boulevard and Farralone Avenue	61.4	62.7	1.3	5.0	No
Valley Circle Boulevard, between Woolsey Canyon Road and Chatlake Drive	60.6	62.4	1.8	5.0	No
Roscoe Boulevard, between Woodlake Avenue and Shoup Avenue	64.3	65.9	1.6	5.0	No
Roscoe Boulevard, between Shoup Avenue and Farralone Avenue	68.4	69.6	1.2	5.0	No
Valley Circle Boulevard, between Vanowen Street and Victory Boulevard	68.9	70.0	1.1	5.0	No
Valley Circle Boulevard, between Burbank Boulevard and US 101	69.1	70.2	1.1	5.0	No
Facility Road at Woolsey Canyon Road[c]	30.2	35.2	5.0	3.0	Yes

NOTES:

[a] Values represent noise levels at 100 feet from the centerline of the roadway.

[b] For the purpose of this analysis a substantial increase in traffic noise levels would occur if the project's haul truck and construction worker vehicle trips would contribute to a traffic noise level increase of 3 dBA or greater over existing ambient noise levels within the County of Ventura and 5 dBA or greater over existing ambient noise levels within the County of Los Angeles and the City of Los Angeles.

[c] Noise levels for this roadway are based on the distance of 1,300 feet where actual noise sensitive receiver is located and traffic volumes are the same as Woolsey Canyon Road due to the lack of information.

[d] Because the grade of Woolsey Canyon Road exceeds 5 percent, TNM was used to estimate noise levels, which were the average of 20 front row house locations at Summit Mobile Home Community.

SOURCE: KOA, 2016; ESA, 2016.

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Woolsey Canyon Road would not be decommissioned. Therefore, no additional noise impacts would be anticipated.

3.6.2 Edison Road Truck Route

Implementation of the Edison Road truck route would require significant grading to provide a paved, all-weather roadway usable by trucks for soil transport. In constructing this 3-mile corridor, earthwork and other construction needs would encompass an area of up to 88 acres. Along this truck route, the nearest noise-sensitive uses include the following:

- The single-family residences located along Pepper Tree Lane approximately 115 feet south of the southern end of this route.
- The American Jewish University located approximately 3,950 feet to the east of the truck route, within unincorporated Ventura County.
- The single-family residences located approximately 2,380 feet east of the truck route, near Pepper Tree Lane, within unincorporated Ventura County.
- The single-family residential uses located approximately 1,365 feet west of the truck route, along Green Pine Place in the city of Simi Valley.
- The single-family residences located approximately 1,260 feet north of the truck route, fronting Royal Avenue in the city of Simi Valley.

With respect to the offsite receptors located in unincorporated Ventura County, because specific construction noise limits for noise-sensitive locations are not currently specified in the General Plan or administrative code, the *County of Ventura Construction Noise Threshold Criteria and Control Plan* (2005) was developed to establish construction noise thresholds for use on all discretionary development projects and ministerial development permits. Based on this plan, the typical sensitive time periods for residential uses (both single- and multi-family) with respect to construction noise are during the evening (7:00 P.M. to 10:00 P.M.) and nighttime (10:00 P.M. to 7:00 A.M. from Monday through Friday, and 10:00 P.M. to 9:00 A.M. on Saturdays) hours, while for school uses the typical sensitive time periods for construction noise are during the daytime (7:00 A.M. to 7:00 P.M. from Monday through Friday, and 9:00 A.M. to 7:00 P.M. on Saturdays) and evening hours.

Because construction activities for the potential truck route would occur during daylight hours (i.e., 7:00 A.M. to 7:00 P.M.), the nearest single-family residences located east and south of the potential truck route, near Pepper Tree Lane, would not be subject to noise-related disturbances during the evening and nighttime periods. Additionally, given the distance of this offsite receptor from the potential truck route (2,380 feet), construction-related noise levels at this receptor would also not be expected to exceed the construction noise thresholds identified in the *County of Ventura Construction Noise Threshold Criteria and Control Plan* even if longer work days during the summer months were to extend into the evening hours. Furthermore, although the typical sensitive time periods for construction noise at school uses are during the daytime and evening hours, the construction noise levels at the American Jewish University campus, which is located approximately 3,950 feet away from the route, would be attenuated by distance to a degree such that this offsite sensitive receptor would not be subject to noise-related disturbances.

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As for the offsite sensitive receptors located in the city of Simi Valley, noise levels associated with construction activities in the city are regulated via permitted hours of operation rather than with a numerical noise standard. Specifically, Section 5-16.02 of the City of Simi Valley's Municipal Code prohibits construction-related activities from occurring outside the hours of 7:00 A.M. and 7:00 P.M. Although the potential truck route is located within unincorporated Ventura County and is not subject to the noise regulations of the city of Simi Valley, it is anticipated that generally construction activities for this truck route would occur within the hours of 7:00 A.M. to 7:00 P.M. Additionally, although there might be occasions where construction of the potential truck route could go further into the evening and nighttime hours, it is expected that, given the distances of these receptors from the potential truck route, any noise levels generated during construction would be attenuated to a degree where a noise nuisance would not occur at these receptors.

Overall, none of the identified nearest offsite sensitive receptors from this potential option are expected to be exposed to noise levels generated from construction of the potential truck route that would result in any potential noise nuisances. Thus, effects from construction noise would be the same as those occurring under the cleanup project at the SSFL site.

While low levels of groundborne vibration from the operation of heavy off-road equipment (dozers, loaders, backhoes, haul trucks, etc.) for construction of the potential truck route would generate vibrations that propagate though the ground, the intensity of the vibrations would diminish rapidly with distance from the source. As recommended in the Ventura County Initial Study Assessment Guidelines, the assessment of potential vibration effects should be conducted using the Federal Transit Administration's (FTA) recommended methodology and criteria. Based on the FTA criteria, construction effects relative to building damage from groundborne vibration would be considered significant if any of the following were to occur:

- Project construction activities would cause a PPV groundborne vibration level to exceed 0.5 in/sec at a reinforced concrete, steel, or timber building.
- Project construction activities would cause a PPV groundborne vibration level to exceed 0.3 in/sec at any engineered concrete and masonry building.
- Project construction activities would cause a PPV groundborne vibration level to exceed 0.2 in/sec at any non-engineered timber and masonry buildings.
- Project construction activities would cause a PPV ground-borne vibration level to exceed 0.12 in/sec at any buildings "extremely susceptible to vibration damage" (i.e., a historical building).

In addition, the FTA has also adopted standards associated with human annoyance for groundborne vibration for the following three land-use categories: Vibration Category 1 – High Sensitivity, Vibration Category 2 – Residential, and Vibration Category 3 – Institutional. The FTA defines Category 1 as buildings where vibration would interfere with operations within the building, including vibration-sensitive research and manufacturing facilities, hospitals with vibration-sensitive equipment, and university research operations. Vibration-sensitive equipment includes, but is not limited to, electron microscopes, high-resolution lithographic equipment, and

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normal optical microscopes. Category 2 refers to all residential land uses and any buildings where people sleep, such as hotels and hospitals. Category 3 refers to institutional land uses such as schools, churches, other institutions, and quiet offices that do not have vibration-sensitive equipment, but still have the potential for activity interference. The vibration thresholds associated with human annoyance for these three land-use categories are shown in **Table 3-26**. No thresholds have been adopted or recommended for commercial and office uses.

TABLE 3-26
GROUNDBORNE VIBRATION CRITERIA FOR GENERAL ASSESSMENT

Land Use Category	Frequent Events [a]	Occasional Events [b]	Infrequent Events [c]
Category 1: Buildings where vibration would interfere with interior operations.	65 VdB[d]	65 VdB[d]	65 VdB[d]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

[a] "Frequent Events" is defined as more than 70 vibration events of the same source per day.
[b] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
[c] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
[d] This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

SOURCE: FTA, 2006.

The various PPV vibration velocities and their corresponding decibels (VdB) for several types of construction equipment that can generate perceptible vibration levels are identified in **Table 3-27**.

TABLE 3-27
VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

	Approximate PPV (in/sec)					Approximate Vibration Decibel (VdB)				
Equipment	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**	**25 Feet**	**50 Feet**	**60 Feet**	**75 Feet**	**100 Feet**
Large Bulldozer	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Hoe Ram	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Caisson Drilling	0.089	0.031	0.024	0.017	0.011	87	78	76	73	69
Loaded Trucks	0.076	0.027	0.020	0.015	0.010	86	77	75	72	68
Jackhammer	0.035	0.012	0.009	0.007	0.004	79	70	68	65	61
Small Bulldozer	0.003	0.001	0.0008	0.0006	0.0004	58	49	47	44	40

Note: in/sec = inches per second.

SOURCE: FTA, 2006.

As shown in Table 3-27, vibration levels generated from heavy off-road construction equipment (e.g., large bulldozer) would attenuate with distance to approximately 0.01 inches per second

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PPV, or 69 VdB, at 100 feet from the equipment. Given that the nearest offsite sensitive receptors would be located at much greater distances than 100 feet from the construction equipment used for the potential truck route, the vibration levels at these receptors would also be much lower and would not be perceptible. Thus, similar to the cleanup project at the SSFL site, adverse effects associated with vibration levels resulting from construction of the potential truck route would be minimal.

With respect to operational noise levels, because no noise-sensitive uses would be located directly adjacent to and along the potential truck route, the truck trips traveling along this 3-mile corridor would not adversely affect any sensitive receptors. At the end of Edison Road, haul trucks would access the local roadway network at Guardian Street and would travel to SR 118 via Tapo Canyon Road. Trucks would generate increased noise levels at noise-sensitive uses (residences) located along Tapo Canyon Road. As such, these existing residential uses would be exposed to increased noise levels associated with the project's truck traffic over the duration of the soil transportation operation. Thus, whereas the residences associated with the Summit Mobile Home Community would experience significant noise increases from the project's truck traffic traveling along Woolsey Canyon Road, the existing residences located on Tapo Canyon Road would be affected instead under this potential option.

To assess potential traffic-related noise exposure on noise-sensitive land uses located along Tapo Canyon Road, the traffic noise levels generated by the peak hour traffic volumes on this roadway segment under the "future with project" conditions were compared to those under the "future without project" conditions.[15] This analysis was conducted for the segment of Tapo Canyon Road that is currently fronted by residential land uses, which is the segment located between Los Angeles Avenue and Cochran Street.

The peak hour roadway noise levels resulting from the addition of construction-related traffic on Tapo Canyon Road under the scenario with a maximum of 96 daily haul trucks are shown in **Table 3-28**.

As shown in Table 3-28, the roadway segment of Tapo Canyon Road that is fronted by noise-sensitive land uses (i.e., residential uses) would experience increases in peak hour traffic noise levels of less than 5 dBA over future baseline conditions under the scenario where a maximum of 96 trucks per day (192 daily round-trips) would occur. Thus, noise related to traffic noise levels on this roadway would be less than significant.

[15] The traffic volumes on Tapo Canyon Road were obtained from the *Santa Susana Field Laboratory Transportation Feasibility Analysis* prepared by KOA Corporation. The year 2038 was selected as the future analysis year because it represents the highest potential year within the cleanup project's remediation timeline, providing an adequate amount of background traffic growth to define a conservative analysis baseline.

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TABLE 3-28
PEAK HOUR ROADWAY NOISE LEVELS – MAXIMUM (96) HAUL TRUCKS

	Noise Levels in dBA L_{eq}(hourly)[a]				
Roadway Segment	**Future (2038) Without Project Traffic Volumes**	**Future (2038) With Project Traffic Volumes**	**Increase**	**Significance Threshold[b]**	**Significant?**
Tapo Canyon Road, between Los Angeles Avenue and Cochran Street	68.2	68.3	0.1	5.0	No

NOTES:

[a] Values represent noise levels at 100 feet from the centerline of the roadway.

[b] As was used for the cleanup project's analysis, a traffic noise level increase of 5 dBA or greater is considered to be a substantial increase in traffic noise levels, since a change of 5 dBA in an exterior environment is considered to be readily perceptible.

SOURCE: KOA, 2016;ESA 2015. Calculation data and results provided in Appendix E.

Overall, whereas the residences associated with the Summit Mobile Home Community would experience significant noise increases from the project's construction-related traffic traveling along Woolsey Canyon Road under the cleanup project at the SSFL site, construction-related traffic on Tapo Canyon Road would be minimal. Therefore, under this potential truck route, construction-related traffic on Tapo Canyon Road would be less in magnitude than those on Woolsey Canyon Road.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, noise from the decommissioning process is anticipated to be similar to or less than the estimates for the construction phase.

3.6.3 Edison Road Overland Conveyor

Implementation of the Edison Road Overland Conveyor route would require the disturbance of approximately 11,400 square feet of land area. As this potential option would run generally along the existing Edison Road, the nearest noise-sensitive uses to this potential overland conveyor route would also be those identified for the potential Edison Road Truck route, which includes:

- The American Jewish University located approximately 3,950 feet to the east, within unincorporated Ventura County.
- The single-family residences located approximately 2,380 feet east, near Pepper Tree Lane, within unincorporated Ventura County.
- The single-family residential uses located approximately 1,365 feet west, along Green Pine Place in the city of Simi Valley.
- The single-family residences located approximately 1,260 feet north, fronting Royal Avenue in the city of Simi Valley.

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- The single-family residences located along Pepper Tree Lane 115 feet south of the southeastern portion of Truck Site 1.

Based on information provided by the FTA, vibration levels generated from heavy off-road construction equipment (e.g., large bulldozer) would attenuate with distance to a PPV of approximately 0.01 inches per second or 69 vibration decibels (VdB), at 100 feet from the equipment. These vibration levels at 100 feet would not exceed the FTA's vibration criteria for building damage (even at buildings categorized as being extremely susceptible to vibration damage) or human annoyance. Given that the nearest offsite sensitive receptor is located 115 feet from Truck Site 1, the vibration levels at this closest offsite receptor would not result in any adverse effects. Overall, construction-related noise and vibration would be the same as those occurring under the cleanup project at the SSFL site.

The use of Truck Site 1 on the approximately 4.7-acre site would require surface grading and paving of the site. The nearest offsite sensitive receptor to this site would be the single-family residential uses located to the southeast, with the nearest residential property located approximately 115 feet away in unincorporated Ventura County. During the grading and paving activities, these nearest residential uses would be exposed to temporary increased noise levels. While construction activities occurring during the daytime hours are not considered to be a sensitive time period for residential uses under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*, construction activities that occur in the evening and nighttime time periods are prohibited from exceeding 50 L_{eq}(h) dBA and 45 L_{eq}(h) dBA, respectively, at residential uses. As such, under conditions where construction would occur during the evening or nighttime hours at the potential Truck Site 1, the noise levels at the nearest offsite sensitive receptors would exceed the noise criteria established under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*. While not anticipated, if construction was undertaken during evening and nighttime, noise associated with construction of Truck Site 1 would be greater than those for the cleanup activities at the SSFL site.

Because no noise-sensitive uses would be located directly adjacent to or along the potential overland conveyor route, the operational noise levels associated with this system along the approximately 2.58-mile-long route would not adversely affect any sensitive receptors. Noise levels generated from the conveyor system would be relatively lower than those generated from trucks. The rollers for the overland conveyor could reach up to 66 dBA at one meter from the noise source, while the drive motors, which are located at both ends of the conveyor, could reach up to 85 dBA at one meter from the noise source. Given the 85 dBA noise level at a distance of one meter from the drive motor at the end of the conveyor and the distance of the nearest noise-sensitive receptors from the conveyor route (i.e., the single-family residences located approximately 1,260 feet north of the route in the city of Simi Valley), the estimated noise level at these receptors would be approximately 33 dBA. This relatively low noise level would not be audible at the nearest offsite residential uses and thus would not result in a noise disturbance. Section 5-16.02 of the City of Simi Valley Municipal Code specifically regulates noise generated by engines, motors, and mechanical devices in and near residential districts by prohibiting their operation in between the hours of 11:00 P.M. to 7:00 A.M. on Friday or Saturday, and between

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the hours of 10:00 P.M. to 7:00 A.M. on Sunday through Thursday unless these noise sources are enclosed to ensure that noise would not be audible within 10 feet of any residence. As the potential overland conveyor would not operate between these prohibited hours, the applicable noise regulations of the City of Simi Valley would not be violated. Overall, the operational noise levels generated by the conveyor along Edison Road under this potential option would be lower than those generated by truck traffic under the Edison Road Truck Route option.

Trucks would travel offsite from Truck Site 1 and onto the local roadways to access SR 118. This truck traffic would generate increased noise levels at noise-sensitive uses (residences, schools, hospitals, etc.) located along the local roadways. It is anticipated that truck traffic traveling from Truck Site 1 to SR-118 would access Tapo Canyon Road, which has residential uses fronting the roadways. As such, these existing residential uses would be exposed to increased noise levels associated with the project's truck traffic over the duration of the soil transportation operation. As analyzed under the Edison Truck Route, it was determined that the noise associated with construction-related traffic on Tapo Canyon Road would be minimal under. Thus, whereas the residences associated with the Summit Mobile Home Community would experience significant noise increases from the project's construction-related traffic traveling along Woolsey Canyon Road under the overall cleanup project at the SSFL site, noise associated with construction-related traffic on Tapo Canyon Road would be less in magnitude. The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, noise from the decommissioning process is anticipated to be similar to or less than the estimates for the construction phase.

3.6.4 North American Cutoff Road Overland Conveyor

Implementation of the North American Cutoff Road Overland Conveyor Route would require the disturbance of approximately 20,400 square feet of land area. Along this potential overland conveyor route, the nearest and most notable noise-sensitive uses include the following:

- The single-family residences on Del Mar Trail located approximately 413 feet northwest of the overland conveyor in unincorporated Ventura County.
- The single-family residences located off of Roberson Road and approximately 625 feet southeast of the overland conveyor in unincorporated Ventura County.
- The single-family residences located directly north of Smith Road and approximately 1,330 feet northwest of the overland conveyor in the city of Simi Valley.

As discussed previously, based on the *County of Ventura Construction Noise Threshold Criteria and Control Plan*, the typical sensitive time periods for residential uses (both single- and multi-family) with respect to construction noise are during the evening (7:00 P.M. to 10:00 P.M.) and nighttime (10:00 P.M. to 7:00 A.M. from Monday through Friday, and 10:00 P.M. on Saturdays) hours. As the construction activities for the potential overland conveyor route are generally expected to occur during daylight hours (i.e., 7:00 A.M. to 7:00 P.M.), the nearest single-family residences identified above that are located to the northwest and southeast of the potential overland conveyor route would not be subject to noise-related disturbances during the evening and nighttime periods. However, there might be times where longer work days would occur

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during the summer months. Given that the nearest offsite single-family residences within unincorporated Ventura County are located within 1,000 feet of the potential overland conveyor route, under conditions where construction work occurs during the evening and/or nighttime hours, there could be a potential for noise levels at these offsite receptors to exceed the evening and nighttime noise criteria of 50 L_{eq}(h) dBA and 45 L_{eq}(h) dBA, respectively, established under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*. Under this condition, the noise associated with construction activity for this potential option would be greater than those for the cleanup activities at the SSFL site because it was determined that the cleanup activities within the SSFL site would not exceed any of the construction noise threshold criteria established in the *County of Ventura Construction Noise Threshold Criteria and Control Plan*. However, it should be noted that construction of the overland conveyor route would occur for approximately 15 months, and as such any noise associated with construction activities occurring into the evening and nighttime hours are only expected to occur periodically over the 15-month window.

As for the offsite sensitive receptors located in the city of Simi Valley, Section 5-16.02 of the City of Simi Valley's Municipal Code prohibits construction-related activities from occurring outside the hours of 7:00 A.M. and 7:00 P.M. Although the potential overland conveyance route is located within unincorporated Ventura County and is not subject to the noise regulations of the City of Simi Valley, it is anticipated that generally construction activities for this truck route would occur within the hours of 7:00 A.M. to 7:00 P.M. Although there might be occasions where construction of the potential overland conveyance system could go further into the evening and nighttime hours, it is expected that, given the distances of these receptors from the potential overland conveyance route, any noise levels generated during construction would be attenuated to a degree where a noise nuisance would not occur at these receptors.

Based on information provided by the FTA, vibration levels generated from heavy off-road construction equipment (e.g., large bulldozer) would attenuate with distance to approximately 0.01 inches per second PPV, or 69 VdB, at 100 feet from the equipment. Given that the nearest offsite sensitive receptors would be located at much greater distances than 100 feet from the construction equipment used for the potential overland conveyance route, the vibration levels at these receptors would also be much lower and would not be perceptible. None of the FTA's vibration criteria associated with building damage or human annoyance would occur at the nearest offsite sensitive land uses would occur from construction of this potential overland conveyor route. Thus, similar to the cleanup project at the SSFL site, adverse effects associated with vibration levels resulting from construction of the potential overland conveyance route would be less than significant.

Because no noise-sensitive uses would be located directly adjacent to and along the potential overland conveyor route, the operational noise levels associated with this system along the approximately 3-mile-long route would not adversely affect any sensitive receptors. Noise levels generated from conveyor systems are relatively low when compared to other soil transportation options such as the use of trucks. The rollers for the overland conveyor could reach up to 66 dBA at one meter from the noise source, while the drive motors, which are located at both ends of the

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conveyor, could reach up to 85 dBA at one meter from the noise source. Given the distance of the nearest noise-sensitive receptors from the conveyor route (i.e., single-family residences on Del Mar Trail located approximately 413 feet northwest of the overland conveyor in unincorporated Ventura County) and conservatively using the 85 dBA reference noise level for a drive motor at a distance of one meter from the noise source, the estimated noise level at these receptors would be approximately 43 dBA. This noise level would not exceed the County's applicable daytime, evening, and nighttime construction activity noise threshold criteria of 55, 50, and 45 dBA L_{eq}(h), respectively. Additionally, as the nearest offsite sensitive receptor located in the city of Simi Valley is located even further away (i.e., approximately 1,330 to the northwest), the result noise levels at these receptors from operation of the overland conveyor would not be audible and thus would not result in a noise disturbance. Section 5-16.02 of the City of Simi Valley Municipal Code specifically regulates noise generated by engines, motors, and mechanical devices in and near residential districts by prohibiting their operation in between the hours of 11:00 P.M. to 7:00 A.M. on Friday or Saturday, and between the hours of 10:00 P.M. to 7:00 A.M. on Sunday through Thursday unless these noise sources are enclosed to ensure that noise would not be audible within 10 feet of any residence. As the potential overland conveyor would not operate between these prohibited hours, the applicable noise regulations of the City of Simi Valley would not be violated. Overall, when compared to the cleanup project at the SSFL site, which would result in significant noise increases at the residential uses located along Woolsey Canyon Road, the use of this potential overland conveyor system route would not affect any noise-sensitive uses located in the vicinity of this route.

Use of Rail Site 2B would require surface grading and potentially paving of the site. The nearest and most notable noise-sensitive uses in the vicinity of the site include:

- The single-family residences located approximately 195 feet to the south, across the railroad tracks in unincorporated Ventura County.
- The single-family residences located approximately 526 feet to the northwest, across Smith Road, in the city of Simi Valley.

While construction activities occurring during the daytime hours are not considered to be a sensitive time period for residential uses under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*, construction activities that occur in the evening and nighttime time periods are prohibited from exceeding 50 L_{eq}(h) dBA and 45 L_{eq}(h) dBA, respectively, at residential uses. As such, under conditions where construction would occur during the evening or nighttime hours at the potential Rail Site 2B, the noise levels at the nearest offsite sensitive receptors would exceed the noise criteria established under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*. Under these conditions, noise associated with construction activity for Rail Site 2B would be greater than those for the cleanup activities at the SSFL site.

As for the offsite sensitive receptors located in the city of Simi Valley, Section 5-16.02 of the City of Simi Valley's Municipal Code prohibits construction-related activities from occurring outside the hours of 7:00 A.M. and 7:00 P.M. Although Rail Site 2B is located within unincorporated Ventura County and is not subject to the noise regulations of the City of Simi

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Valley, it is anticipated that generally construction activities at this site would occur within the hours of 7:00 A.M. to 7:00 P.M. However, under occasions where construction activities at Rail Site 2B would go further into the evening and nighttime hours, it is expected that, given the nearest offsite receptors in the City are located within 1,000 feet of the site, noise levels generated during construction could result in a nuisance at these receptors.

Based on information provided by the FTA, vibration levels generated from heavy off-road construction equipment (e.g., large bulldozer) would attenuate with distance to a PPV of approximately 0.01 inches per second, or 69 vibration decibels (VdB), at 100 feet from the equipment. Given that the nearest offsite sensitive receptors would be located at much greater distances than 100 feet from the construction equipment used at Rail Site 2B, the vibration levels at these receptors would also be much lower and would not be perceptible. As such, none of the FTA's vibration criteria associated with building damage or human annoyance would occur at the nearest offsite sensitive land uses would occur from construction activities at Rail Site 2B. Thus, similar to the cleanup project at the SSFL site, adverse effects associated with vibration levels resulting from construction activities at Rail Site 2B would be minimal.

The number of trains on the main line (year 2016) past the site is as follows:

- Metrolink commuter trains: 16 per day (8 each direction)
- Surfliner intercity trains: 12 per day (6 each direction)
- Amtrak long distance trains (Coast Starlight): 2 per day (1 each direction)
- Freight trains: highly variable, since freight trains do not operate on a set schedule. Recent information indicates there are currently 4 to 8 freight trains per day operating past the project site.

It is likely that there would be additional trains operating along this route in the future. However, the exact number is uncertain, since passenger trains (unlike freight trains) rely on public funding, while the frequency of freight trains is generally responsive to business cycles. Thus, an accurate estimate of the number of trains in the future cannot be provided at this time.

While the use of freight trains to transport soil offsite would not involve introducing a new noise source in the area, given that the corridor currently is used by both passenger and freight trains, the use of rail for the transport of the project's soil would result in increased freight train trips on the corridor by one train per day. In turn, the additional frequency by which the train tracks are used for the project could result in additional temporary noise effects on nearby sensitive land uses that may be located along and in the vicinity of the train tracks.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, noise from the decommissioning process is anticipated to be similar to or less than the estimate for the construction phase.

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3.6.5 North American Cutoff Road Aerial Conveyor

Implementation of the North American Cutoff Road Aerial Conveyor system would require the disturbance of approximately 3 acres of land. As this potential option would run generally along the same route as the potential overland conveyor route, the nearest noise-sensitive uses to this potential route option would also be those identified above for the potential overland conveyance route option.

Similar to the evaluation of the potential overland conveyor route, it is anticipated that during times where longer work days would occur during the summer months, there could be a potential for noise levels at the nearest offsite receptors located within unincorporated Ventura County to exceed the evening and nighttime noise criteria of 50 L_{eq}(h) dBA and 45 L_{eq}(h) dBA, respectively, established under the *County of Ventura Construction Noise Threshold Criteria and Control Plan*. Under this condition, noise associated with construction activity for this potential option would be greater than those for the cleanup activities at the SSFL site. However, it should be noted that construction of the aerial conveyor route would occur for approximately 2 years only, and as such any noise associated with construction activities occurring into the evening and nighttime hours are only expected to occur periodically over the 2-year window. As for the offsite sensitive receptors located in the city of Simi Valley, which are located approximately 1,330 feet away from the potential aerial conveyor route, it is expected that any noise levels generated during construction would be attenuated to a degree where a noise nuisance would not occur at these receptors.

Similar to the potential overland conveyor system, the vibration levels at all of the identified nearest offsite sensitive receptors would not be perceptible given their distances from the construction area, and none of the FTA's vibration criteria associated with building damage or human annoyance would occur at the nearest offsite sensitive land uses would occur from construction of this potential aerial conveyor route. Thus, similar to the cleanup project at the SSFL site, vibration levels resulting from construction of the potential aerial conveyance route would be minimal.

Because no noise-sensitive uses would be located directly adjacent to or along the potential aerial conveyor route, the operational noise levels associated with this system along the approximately 3.1-mile-long route would not adversely affect any sensitive receptors. Noise levels generated from aerial conveyor systems are relatively low when compared to other soil transportation options such as the use of trucks. The noise levels generated along the aerial conveyor can reach up to approximately 62 dBA at the pylons, 60 dBA in-between pylons, 84 dBA at the outside of the bucket loading station, 85 dBA at the main drive house, and 87 dBA at the outside of the bucket off-loading station. Based on the location of the nearest offsite sensitive receptors identified along this conveyor route, these sensitive receptors would only be exposed to noise levels generated at the pylons and in-between the pylons. For the purpose of this analysis, the higher noise level of 62 dBA at the pylon is used to estimate the noise levels at the nearest offsite

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receptors.[16] Given the nearest offsite receptors are located 413 feet away from the potential aerial conveyor route, the estimated noise level at these receptors would be approximately 20 dBA. This noise level would not exceed the County's applicable daytime, evening, and nighttime construction activity noise threshold criteria of 55, 50, and 45 dBA L_{eq}(h), respectively. Additionally, as the nearest offsite sensitive receptor located in the city of Simi Valley is located even further away (i.e., approximately 1,330 to the northwest), the result noise levels at these receptors from operation of the overland conveyor would not be audible and thus would not result in a noise disturbance. Section 5-16.02 of the City of Simi Valley Municipal Code specifically regulates noise generated by engines, motors, and mechanical devices in and near residential districts by prohibiting their operation in between the hours of 11:00 P.M. to 7:00 A.M. on Friday or Saturday, and between the hours of 10:00 P.M. to 7:00 A.M. on Sunday through Thursday unless these noise sources are enclosed to ensure that noise would not be audible within 10 feet of any residence. As the potential overland conveyor would not operate between these prohibited hours, the applicable noise regulations of the City of Simi Valley would not be violated. Overall, when compared to the cleanup project at the SSFL site, which would result in significant noise increases at the residential uses located along Woolsey Canyon Road, the use of this potential aerial conveyor system route would not affect any noise-sensitive uses located in the vicinity of this route.

This potential option would also require construction and operation of Rail Site 2B. Noise associated with construction and operation of Rail Site 2B would be the same as identified under the Environmental Screening Analysis presented for the North American Cutoff Road Overland Conveyor in Section 3.6.4.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, noise from the decommissioning process is anticipated to be similar to or less than the estimate for the construction phase.

3.7 Traffic

The most recent data published by the Caltrans was reviewed to determine the average daily traffic volumes for all roadway segments and intersections affected by the potential options. The estimated daily truck haul trips for each potential option were then added to the existing average daily traffic volumes for all applicable roadway segments and intersections to determine if the potential options would result in congestion along the affected roadway segments and intersections.

3.7.1 Woolsey Canyon Road Truck Route

Traffic generated by both truck hauling and employee vehicle access during SSFL site remediation activities were analyzed within the *Traffic Study for Santa Susana Field Laboratory*

[16] For the purpose of this analysis, it is assumed that the 62 dBA noise level at the aerial conveyor pylon was measured at a reference distance of one meter from the noise source.

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EIR, prepared by KOA Corporation (2017). During the peak period of remediation activities, the project is expected to generate up to 96 round-trip truck trips on a typical day of operations and up to 250 worker trips (a daily total of 740 passenger car equivalent trips, with 155 trips occurring during both the A.M. and P.M. peak hours) [17]. During the peak period of remediation, the total daily trips could increase to 980 and the peak-hour trips could increase to 185.

Significantly affected locations, based on a review of level of service at major intersections and roadway segments, include the following:

- Intersections at the SR 118/Topanga Canyon Boulevard interchange
- The intersection of Valley Circle Boulevard/Woolsey Canyon Road
- The intersection of Valley Circle Boulevard/Roscoe Boulevard
- The intersection of Topanga Canyon Boulevard/Roscoe Boulevard
- The intersection at Topanga Canyon Boulevard/US-101 Northbound Ramps
- Five roadway segments on Valley Circle Boulevard and Roscoe Boulevard

Avoidance of truck trips during peak traffic hours on haul routes would reduce impacts, but impacts of vehicle trips by project workers during peak traffic hours would exceed the thresholds of significance established for this analysis for intersections and road segments, and the impacts after implementation of Mitigation Measure TRANS-1 would be considered significant and unavoidable.

Woolsey Canyon Road would not be decommissioned and therefore no additional traffic impacts from equipment, labor and worker trips are anticipated.

3.7.2 Edison Road Truck Route

For the Edison Road Truck Route, a daily total of up to 96 trucks would be split between Woolsey Canyon Road and the new Edison Road to transport contaminated soils from the SSFL site to disposal sites and to transport clean backfill to the site. Assuming a 50:50 split, impacts along the Woolsey Canyon Road route would be less than those described in Section 3.7.1, with significant impacts to level of service occurring at three instead of six intersections and on two instead of five roadway segments described previously.

Trucks hauling material to and from the site via the Edison Road Truck Route would use Tapo Canyon Road to access SR 118. An increase of 48 trucks per day to this public roadway network would result in congestion on Tapo Canyon Road, south of the SR 118 interchange, which would be considered a significant effect. Potential traffic effects on roadway segments and intersections

[17] The A.M. and P.M. peak hours for each study intersection (i.e., the four highest consecutive 15-minute periods within each of the two-hour peak periods of 7:00 A.M. to 9:00 A.M. and 4:00 P.M. to 6:00 P.M.) vary somewhat (though are generally 7:15 A.M. to 8:15 A.M. and 4:45 P.M. to 5:45 P.M.).

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would be reduced if truck hauling activities were required to be limited to off-peak traffic hours and if some worker traffic also used Edison Road to access the site.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, traffic impacts from the decommissioning process would be similar to or less than those estimated for the construction phase.

3.7.3 Edison Road Overland Conveyor

For the Edison Road Overland Conveyor option, a total of up to 96 trucks would traverse Tapo Canyon Road to access the site and to access SR 118. An increase of 96 trucks per day to this public roadway network would result in congestion on Tapo Canyon Road, south of the SR 118 interchange, which would be considered a significant effect. Potential traffic effects on roadway segments and intersections could be mitigated if truck hauling activities were required to occur outside of peak traffic periods. Signalization of some of the currently unsignalized locations could also mitigate traffic that may occur at the affected intersections.

Under this potential option, soils contaminated with radioactive material (approximately 134,000 CY) would be transported by truck via Woolsey Canyon Road. Clean backfill (approximately 1,366,000 CY) would also be transported to the site via Woolsey Canyon Road. As discussed previously for the Woolsey Canyon Road Truck Route, significant impacts resulting from project-related traffic at affected intersections could be avoided if truck hauling activities were required to occur outside of peak traffic periods.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, traffic impacts from the decommissioning process are expected to be similar to or less than those estimated for the construction phase.

3.7.4 North American Cutoff Road Overland Conveyor

The North American Cutoff Road Overland Conveyor option would result in using a conveyor system to transport soil from the SSFL site directly to an existing rail line. Therefore, this potential option would result in a substantial reduction in project-related truck traffic as approximately 1,685,000 CY of hazardous and non-hazardous soil would be transported by conveyor and train.

Under this potential option, soils contaminated with radioactive material (134,000 CY) would be transported by truck via Woolsey Canyon Road. Clean backfill (1,300,000 CY) would also be transported to the site via Woolsey Canyon Road. As discussed previously for the Woolsey Canyon Road Truck Route, significant impacts resulting from project-related traffic at affected intersections could be avoided if truck hauling activities were required to occur outside of peak traffic periods.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, the traffic impacts anticipated from the

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decommissioning process are expected to be similar to or less than those estimated for the construction phase.

3.7.5 North American Cutoff Road Aerial Conveyor

The North American Cutoff Road Aerial Conveyor option would result in using a conveyor system to transport soil from the SSFL site directly to an existing rail line. Therefore, this potential option would result in a substantial reduction in project-related truck traffic as approximately 1,685,000 CY of hazardous and non-hazardous soil would be transported by conveyor and train.

Under this potential option, soils contaminated with radioactive material (134,000 CY) would be transported by truck via Woolsey Canyon Road. Clean backfill (1,685,000 CY) would also be transported to the site via Woolsey Canyon Road. As discussed previously for the Woolsey Canyon Road Truck Route, significant impacts resulting from project-related traffic at affected intersections could be avoided if truck hauling activities were required to occur outside of peak traffic periods.

The equipment, labor and worker trips required for decommissioning are anticipated to be comparable to the construction phase. Therefore, traffic impacts anticipated from the decommissioning process are expected to be similar to or less than those estimated for the construction phase.

4.0 Comparison of Feasible Transportation Options

This section provides a comparison of the technological and environmental analyses conducted for the potential options evaluated in Section 2.2 and Section 3.0 of this report.

4.1 Feasibility Summary

As discussed in Section 2.2, the potential truck and conveyor routes were evaluated for required land access, technological feasibility, rail logistics (as necessary), permitting constraints, implementation schedule, and cost.

4.1.1 Land Access

Woolsey Canyon Road Truck Route consists exclusively of existing public roads that would not require any improvement for use as a truck route. Therefore, this potential option would not require any acquisition or access to land. Each of the potential options evaluated would require access to private lands (by purchase or easement) with multiple land owners (as presented in **Table 4-1**) in order to implement. As such, development of each potential option would require negotiation of land access agreements with multiple owners.

Given the uncertainty and potential complexity of land control negotiations, this analysis assumes overall feasibility for development would be directly proportional to the number of individual

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access agreements that would be required for each potential option. Therefore, in terms of land access, the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

TABLE 4-1
SUMMARY OF LAND DISTURBANCE AND OWNERSHIP

Route / Option	Total Area of Disturbance	No. of Parcels	No. of Land Owners
Woolsey Canyon Road Truck Route	0	0	0
Edison Road Truck Route	88 acres[a]	14 parcels	> 4 private owners and/or easement holders b
Edison Road Overland Conveyor	4.7 acres	14 parcels	> 4 private owners and/or easement holders [b]
North American Cutoff Road Overland Conveyor	11.9 acres	20 parcels	> 5 private owners [b] 3 public agencies
North American Cutoff Road Aerial Conveyor	14 acres	20 parcels	> 5 private owners [b] 3 public agencies

NOTES:

[a] The amount of disturbance for this potential option is due to grading necessary to reconfigure the roadway and not only the acreage of the roadway.

[b] The exact number of land owners for these potential options is currently unknown because the data obtained for this analysis did not identify the owners of the all parcels along the routes (they were listed as anonymous or unknown).

4.1.2 Technological Feasibility

Because the Woolsey Canyon Road Truck Route consists of existing roadways that would not require any improvement to use as a haul route, this route is considered to be the most technologically feasible. As discussed in detail in Section 2.2, all four potential options are technologically feasible, as technologically infeasible routes were not considered. The routes would require different scales of development. As presented in Table 4-1, development of these potential options would result in disturbance of 4.7 to 88 acres of land. Each potential option would also result in different levels of onsite construction including grading, paving, and construction of new infrastructure. Despite the differences in land disturbance, from a technological feasibility perspective, the four sites are very similar and this is not a distinguishing characteristic.

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4.1.3 Rail Logistics

The Woolsey Canyon Road Truck Route, Edison Road Truck Route, and Edison Road Overland Conveyor Route do not involve transport by rail; therefore, these potential options would not require any negotiations, agreements, permits, or physical improvements related to rail access.

The two North American Cutoff Road Conveyor Route options would require development of a rail transfer station to transfer soil from the conveyor to railcars, and to stage railcars prior to shipment. These potential options would also require construction of a new railroad siding and would require agreements with SCRRA and UPRR for construction of the new facilities and use of the railroad.

With regard to rail logistics, the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route, Edison Road Truck Route, and Edison Road Overland Conveyor Route
2. North American Cutoff Road Overland Conveyor/North American Cutoff Road Aerial Conveyor

4.1.4 Permitting Constraints

Use of the Woolsey Canyon Road Truck Route would not require construction or new land disturbance and therefore would not require any permits related to construction. The only permitting activity that may be required for use of this route would be potential coordination with the City of Los Angeles and Caltrans for the occasional oversize load.

Development of the Edison Road Truck Route would require fewer permits and approvals than the conveyor options which would involve construction of hazardous waste transfer sites on lands not currently zoned for such uses.

The three conveyor options would require the most permits/approvals. These potential options are ranked as the least feasible due to the uncertainty of local permitting agencies (the City of Simi Valley and/or County of Ventura) to approve the potential Conditional Use Permits and zone changes that would be necessary to develop the truck or rail transfer site. Development of the aerial conveyor is the least feasible with respect to permitting constraints because it would require installation of towers up to 120 feet tall (as discussed in Section 3.5.5 of this report, Ventura County development standards limit the maximum structure height for principal structures to 25 feet). The use of Edison Road as a haul road for contaminated material is not explicitly identified among the permitted uses in the Open space and Rural Agriculture zones in Ventura County. Temporary collection activities associated with hazardous waste collection, treatment and storage facilities are allowed in the Open Space and Rural Agriculture zones in Ventura County with obtainment of a zoning clearance, or other ministerial approved permit.

The Simi Valley Zoning Ordinance also does not explicitly identify haul roads among the permitted uses in the Open Space, Residential, Water Storage Facility, and Business Park zones.

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However, the City may consider the haul road to be an access road, which could be an allowable use within these zones. However, reasonably similar uses that also involve hazardous wastes are allowed in the Open Space and Residential Zones with obtainment of a Conditional Use Permit. Truck Site 1 is located within the Business Park zone which also does not list hazardous waste collection, treatment and storage facilities among the allowable uses. However, reasonably similar uses that also involve hazardous wastes such as motor vehicles and transportation equipment, solid waste disposal facilities and transmission/distribution pipelines and surface facilities are allowed in this zone. Overall, implementation of the Edison Road Truck Route within Open Space, Residential, Water Storage Facility, and Business Park zones may not be a compatible use and further discussion with the City of Simi Valley planning department must take place to determine whether implementation of the Edison Road Truck Route would be allowable.

With regard to permitting, the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

4.1.5 Implementation Schedule

As shown in **Table 4-2**, the implementation schedules, including design, environmental review, land acquisition, permitting and construction of the four potential options are relatively similar and range in duration from 45 to 48 months. It is anticipated that implementation of any of these routes could begin a few months after certification of the PEIR for the SSFL project, which is currently anticipated to occur in late 2017. Implementation of the Woolsey Canyon Road Truck Route could begin as soon as excavation activities at the SSFL site begin, which is currently anticipated to be in January 2018.

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TABLE 4-2
IMPLEMENTATION SCHEDULE SUMMARY

	Development [a]		Operation		Decommissioning	
Technology/Segment	**Start**	**Finish**	**Start**	**Finish**	**Start**	**Finish**
Woolsey Canyon Road Truck Route	NA	NA	February 2018	November 2032	NA	NA
Edison Road Truck Route	December 2017	August 2021	August 2021	November 2032	NA	NA
Edison Road Overland Conveyor	December 2017	November 2021	November 2021	November 2032	November 2032	November 2033
North American Cutoff Road Overland Conveyor	December 2017	November 2021	November 2021	November 2032	November 2032	November 2033
North American Cutoff Road Aerial Conveyor	December 2017	August 2021	August 2021	November 2032	November 2032	November 2033

Notes: NA – Not applicable
[a] Development includes design, environmental review, land acquisition, permitting, and construction.

Implementation of any of these potential options would begin with detailed design, negotiation of land control, and initiation of the environmental review process. These activities could begin immediately upon certification of the PEIR (this schedule assumes activities would start within 45 days after PEIR approval). Assuming certification of the PEIR in December 2017, construction of any of these potential options would be completed between September and November 2021, as shown in Table 4-2.

The operational schedule of the Woolsey Canyon Road Truck Route would depend on how many trucks can be loaded and leave the site per day. As shown in Table 1-2, it is assumed that the rate at which contaminated soil would be excavated is between 413 and 1,027 CY per day, which equates to 27 to 67 truck trips (round trips), respectively. Additional trucks would transport clean backfill and other necessary equipment to the site using 14 to 29 additional truck trips per day. The total number of daily truck trips (round trips) for this alternative would range between 48 and 96 (which averages to 67 trucks/day over the 15-year project schedule. The operational schedule for all four feasible transportation options would be approximately 15 years. The Woolsey Canyon Road Truck Route would commence operation as soon as February 2018. If one of the potential options is selected, it is anticipated that the selected option could begin operation in late 2021.

Because the selected transportation option would be expected to operate at the same pace as the overall site cleanup for SSFL, any of the options would be expected to result in completion of the cleanup within the same approximate timeframe as the proposed project. However, due to the need to decommission the conveyors, truck site, and rail site, the potential conveyor options would require an additional year of activity to remove infrastructure and conduct restoration.

The Woolsey Canyon Road Truck Route and alternative soil transport routes are ranked in order of the operational completion dates presented in Table 4-2.

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1. Woolsey Canyon Road Truck Route/Edison Road Truck Route (November 2032)
2. All three conveyor routes (November 2033)

4.1.6 Cost

Table 4-3 summarizes the capital costs of developing each potential option, including design, environmental review, land acquisition, permitting, construction, and decommissioning. **Table 4-4** summarizes the cost of operating each potential option. The costs include transport of excavated soil from remediation locations at the SSFL site to the conveyance loading points (as applicable to the mode of conveyance) and the costs of transfers (conveyor to truck, conveyor to rail, etc.). For the conveyor routes, in general, operations would be automatic with signal lights, truck loading/unloading bays, and automatic materials transfer. Additional costs were considered and included where additional handling steps would be necessary to accounted for total operating costs.

Table 4-5 presents the total cost of developing and operating each potential option.

TABLE 4-3
CAPITAL CONSTRUCTION COSTS COMPARISON

Technology/Segment	Destination	Total Estimated Capital Costa
Woolsey Canyon Road Truck Route	SR 118 or US-101, direct to landfills	N/A [a]
Edison Road Truck Route	SR 118, direct to landfills	$17 million
Edison Road Overland Conveyor	Truck Site 1	$80 million
North American Cutoff Road Overland Conveyor	Rail Site 2B	$86 million
North American Cutoff Road Aerial Conveyor	Rail Site 2B	$52 million

Notes
[a] This route would use existing public roadways, from the edge of the SSFL site to the regional freeway network. Construction of new roadways or other capital equipment is not necessary.
See Appendix B for more details

TABLE 4-4
OPERATING COSTS COMPARISON

Technology/Segment	Total Operation Cost
Woolsey Canyon Road Truck Route	$447 million
Edison Road Truck Route	$447 million
Edison Road Overland Conveyor	$464 million
North American Cutoff Road Overland Conveyor	$672 million
North American Cutoff Road Aerial Conveyor	$672 million

See Appendix B for more details

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TABLE 4-5
TOTAL COST OF DEVELOPMENT AND OPERATION

Technology/Segment	Development Cost	Operating Cost	Total Cost[a]
Woolsey Canyon Road Truck Route	-	$447 million	$447 million
Edison Road Truck Route	$17 million [a]	$447 million	$464 million
Edison Road Overland Conveyor	$80 million [a]	$464 million	$544 million
North American Cutoff Road Overland Conveyor	$86 million [a]	$672 million	$758 million
North American Cutoff Road Aerial Conveyor	$52 million [a]	$672 million	$724 million

[a] Includes decommissioning
See Appendix B for more details

With regard to total cost of implementation, the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Aerial Conveyor
5. North American Cutoff Road Overland Conveyor

4.2 Environmental Summary

Section 3.0 of this report presents environmental analysis of each potential option. This section summarizes and compares potential adverse environmental effects and issues involved with development of each potential option. **Table 4-6** through **Table 4-13** present more detailed summaries of the environmental analysis for each potential option.

4.2.1 Air Quality Comparison

The purpose of the feasibility analysis is to compare the impacts from each of the alternative soil transport routes to each other as well as the regulatory thresholds. In order to show a complete comparison of the emissions associated with each potential option, the emissions that occur within each of the regulatory jurisdictions as well as the total emissions are shown. This is because while emissions outside the jurisdictional areas are not compared to thresholds, they make up the majority of transportation emissions and without including those emissions the transportation comparison would not be completely accurate. Additionally, while the emissions within each regulatory jurisdiction are compared to the thresholds, these emissions do not represent the complete emissions that would occur or be included in the significance finding under CEQA. Under CEQA the emissions from onsite activities would also be included in the

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construction and operational emissions as appropriate. However, because the onsite activities would not change regardless of the potential option chosen, the addition of these emissions could overshadow the differences in the transportation emissions from the potential options and therefore are not included in these emissions calculations. Therefore, while emissions in this feasibility analysis may show emissions below the thresholds for various potential options, this is only in respect to the transportation emissions. When these transportation emissions are added to the onsite emissions from remediation activities, the total daily emissions would exceed regulatory thresholds for NOx regardless of the potential option chosen—i.e. none of these potential options would reduce the significant and unavoidable impacts for NOx emission that was identified in the PEIR for the SSFL project.

The Woolsey Canyon Road Truck Route would not require construction or decommissioning, and therefore would not emit air pollutants or GHG during the construction or decommissioning phases. However, all other potential options would require construction and eventual decommissioning, which would result in emissions. As shown in **Table 4-6**, construction of the potential options (Edison Road Truck Route, Edison Roade Overland Canyon, and North American Cutoff Road Overland Conveyor) has the potential to exceed the SCAQMD and VCAPCD regional thresholds for NOx. These potential options would not exceed any of the other regulatory thresholds for NOx, or any of the other criteria pollutants (CO, VOC/ROG, SOx, PM10, PM2.5). The North American Cutoff Road Aerial Conveyor would not exceed any of the regulatory thresholds. Note that the emissions from construction and truck transportation take into account the requirement to use Tier 4 onsite equipment and haul trucks that are year 2014 or newer. Additionally, because the Woolsey Canyon Road Truck Route would be in operation during the construction of any potential options, the operational emissions from the Woolsey Canyon Road Truck Route are included in the construction emissions for each potential option. Because the operational emissions are included, the thresholds for operational activities are used for the comparison. All of the construction scenarios would exceed the GHG emissions threshold without the incorporation of mitigation measure GHG-3. With incorporation of mitigation measure GHG-3 emissions would be reduced to below the thresholds for all scenarios.

In terms of air quality and GHG issues, for construction, the route with the fewest adverse environmental effects would be Woolsey Canyon Road Truck Route, because no construction emissions would be generated, while three of the potential options would result in emissions of NOx that exceed SCAQMD and VCAPCD regulatory thresholds. During construction, the route with the fewest adverse environmental effects with respect to air quality (in order of least adverse to most adverse) are as follows:

1. Woolsey Canyon Road Truck Route
2. North American Cutoff Road Aerial Conveyor
3. North American Cutoff Road Overland Conveyor
4. Edison Road Truck Route
5. Edison Road Overland Conveyor

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TABLE 4-6
AIR QUALITY CONSTRUCTION EMISSIONS COMPARISON TABLE

Route	ROG	NOx	CO	SOx	PM10	PM2.5	CO_2e[1]
	Pounds/Day						MT/Year
Woolsey Canyon Road Truck Route	0	0	0	0	0	0	0
Edison Road Truck Route	5	91	97	2	14	7	13,025
Edison Road Overland Conveyor	6	97	111	2	14	7	12,287
North American Cutoff Road Overland Conveyor	5	85	84	2	15	8	12,239
North American Cutoff Road Aerial Conveyor I	5	71	64	2	20	11	12,080
Regional Emissions and Thresholds by Jurisdiction							
VCAPCD							
Woolsey Canyon Road Truck Route	0	0	0	0	0	0	0
Edison Road Truck Route	2	**41**	76	<1	14	7	*N/A*
Edison Road Overland Conveyor	3	**46**	88	<1	13	7	*N/A*
North American Cutoff Road Overland Conveyor	2	**36**	65	<1	15	8	*N/A*
North American Cutoff Road Aerial Conveyor	2	22	44	<1	20	11	*N/A*
VCAPCD Thresholds	*25*	*25*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
SCAQMD							
Woolsey Canyon Road Truck Route	0	0	0	0	0	0	0
Edison Road Truck Route	4	**64**	87	1	14	7	13,025
Edison Road Overland Conveyor	4	**70**	100	1	13	7	12,287
North American Cutoff Road Overland Conveyor	3	**58**	74	1	15	8	12,239
North American Cutoff Road Aerial Conveyor	3	45	54	1	20	11	12,080
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*100*	*55*	*10,000*
City of Simi Valley							
	Tons/Year						*MT/Year*
Woolsey Canyon Road Truck Route	0	0	0	0	0	0	0
Edison Road Truck Route	<1	5	10	<1	2	1	*N/A*
Edison Road Overland Conveyor	1	13	14	<1	2	1	*N/A*
North American Cutoff Road Overland Conveyor	1	11	11	<1	2	1	*N/A*
North American Cutoff Road Aerial Conveyor	1	9	8	<1	3	1	*N/A*
City of Simi Valley Thresholds	*13.7*	*13.7*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

Notes:
< denotes emissions that are less than 1 but are greater than 0.
Bolded values indicate exceedance of significance threshold.
City of Simi Valley thresholds are not included in this table. None of the potential transportation options would exceed City thresholds during construction or operation.
* Conveyor operation only.
[1] CO_2e represents emissions without incorporation of mitigation measure GHG-3 for comparative purposes.

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Table 4-7 compares the operational emissions for all potential options. During operations, the North American Cutoff Road Overland Conveyor and North American Cutoff Road Aerial Conveyor options would exceed SCAQMD pollutant thresholds for NOx. This is due to the emissions factors for the trains and the amount of time the trains would operate within the SCAQMD's jurisdiction. Trucks would spend considerably less time within the SCAQMD's jurisdiction and therefore less NOx would be emitted within the jurisdictional boundaries. NOx emissions thresholds would not be exceeded within the VCAPCD or City of Simi Valley. None of the other criteria pollutants exceed the regulatory thresholds of the VCAPCD, SCAQMD, or City of Simi Valley for any potential option. The Woolsey Canyon Road Truck Route, Edison Road Truck Route and Edison Road Overland Conveyor emissions are relatively similar for all criteria pollutants. This is because they would be traveling to the same disposal sites and the truck routes would only differ by a couple miles. Due to the slight change in mileage, the Woolsey Canyon Road Truck Route would exceed the criteria pollutant emissions of the other two trucking options. Operation of the North American Cutoff Road conveyor options would result in more air pollutants. While the conveyor systems remove some of the emissions from the trucks, the operation of the trains is less efficient from a pollutant standpoint, as is detailed in environmental analysis above. Additionally, even though the disposal trucks would be removed from the equation, additional truck trips would be required to import clean backfill.

The Edison Road Overland Conveyor and North American Cutoff Road Overland Conveyor options are the only potential options with the potential to exceed the VCAPCD GHG threshold. This is due to the comparatively large quantity of electricity required to power the overland conveyor. The Woolsey Canyon Road Truck Route would generate the second largest quantity of GHG emissions, but is not expected to exceed applicable GHG emissions thresholds. The North American Cutoff Road Aerial Conveyor would generate the lowest quantity of GHG emissions. None of the potential options would exceed the SCAQMD GHG threshold.

During the operational phase, the route with the fewest adverse environmental effects with respect to air quality (in order of least adverse to most adverse) are as follows:

1. Edison Road Overland Conveyor/Edison Road Truck Route (same haul distance and same operational emissions)
2. Woolsey Canyon Road Truck Route
3. North American Cutoff Road Overland Conveyor
4. North American Cutoff Road Aerial Conveyor

During the operational phase, the route with the fewest adverse environmental effects with respect to GHG is determined based on the emissions without the inclusion of mitigation measure GHG-3 since implementation of this measure would reduce emissions of all options to the same level. While criteria pollutants are based only on exhaust emissions, the GHG emissions take into account the emissions from electricity consumption from the conveyor options. While these emissions are not substantial in consideration of overall emissions, they differ enough so that there is a distinct difference within the similar options (i.e., between the Edison Road Truck Route and Edison Road Overland Conveyor).

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In order from least to most emissions the ranking of potential options would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

TABLE 4-7
AIR QUALITY OPERATIONAL EMISSIONS COMPARISON TABLE

Route	ROG	NOx	CO	SOx	PM10	PM2.5	CO_2e[1]
	Pounds/Day						MT/Year
Woolsey Canyon Road Truck Route	3	50	19	2	<1	<1	11,128
Edison Road Truck Route	2	37	14	1	<1	<1	11,184
Edison Road Overland Conveyor	2	37	14	1	<1	<1	12,701
North American Cutoff Road Overland Conveyor	176	2,816	675	46	112	108	19,762
North American Cutoff Road Aerial Conveyor	177	2,828	691	47	112	108	21,886
Regional Emissions and Thresholds by Jurisdiction							
VCAPCD							
Woolsey Canyon Road Truck Route	<1	1	1	<1	<1	<1	*N/A*
Edison Road Truck Route	<1	2	2	<1	<1	<1	*N/A*
Edison Road Overland Conveyor	<1	2	2	<1	<1	<1	*N/A*
North American Cutoff Road Overland Conveyor	<1	5	2	<1	<1	<1	*N/A*
North American Cutoff Road Aerial Conveyor	<1	5	2	<1	<1	<1	*N/A*
VCAPCD Thresholds	*25*	*25*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*
SCAQMD							
Woolsey Canyon Road Truck Route	1	24	9	1	<1	<1	11,128
Edison Road Truck Route	1	11	3	<1	<1	<1	11,184
Edison Road Overland Conveyor	1	11	3	<1	<1	<1	12,701
North American Cutoff Road Overland Conveyor	29	**462**	119	8	18	18	19,762
North American Cutoff Road Aerial Conveyor	29	**462**	119	8	18	18	21,886
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*100*	*55*	*10,000*

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Route	ROG	NOx	CO	SOx	PM10	PM2.5	CO_2e[1]
City of Simi Valley							
	Tons/Year						*MT/Year*
Woolsey Canyon Road Truck Route	<1	<1	<1	<1	<1	<1	*N/A*
Edison Road Truck Route	<1	<1	<1	<1	<1	<1	*N/A*
Edison Road Overland Conveyor	<1	<1	<1	<1	<1	<1	*N/A*
North American Cutoff Road Overland Conveyor	<1	1	<1	<1	<1	<1	*N/A*
North American Cutoff Road Aerial Conveyor	<1	1	<1	<1	<1	<1	*N/A*
City of Simi Valley Thresholds	*13.7*	*13.7*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*

Notes: **Bolded** values indicate exceedance of significance threshold.
< denotes emissions that are less than 1 but are greater than 0.
1 CO_2e represents emissions without incorporation of mitigation measure GHG-3 for comparative purposes.

4.2.2 Biological Resources Comparison

In general, adverse effects on biological resources would primarily occur during construction and would be the direct result of ground disturbance. Accordingly, use of the Woolsey Canyon Road Truck Route would result in no adverse effects biological resources because the route would not require construction. All other analyzed potential options are anticipated to have significant adverse effects on biological resources and would likely require permits from USFWS, CDFW, USACE, and RWQCB.

As shown in **Table 4-8**, all analyzed transportation options, with the exception of the Woolsey Canyon Road Truck Route, have the potential to adversely affect special-status species, vegetation communities and habitat, nesting habitat, the Arroyo Simi and other ephemeral drainages, oak trees, and vernal pools. Within the scope of this analysis, the Edison Road and North American Cutoff Road options appear to affect the same types of biological resources; however, because the overland conveyor option would deviate from the North American Cutoff Road ROW more than the aerial conveyor route would, the overland route would result in more disturbance to previously undisturbed land than the aerial route would. However, the Edison Road Truck Route would disturb the largest quantity of land and would therefore have a greater potential to disturb biological resources. The overland conveyor options would disturb substantially less land when compared to the Edison Road Truck Route and North American Cutoff Road Aerial Conveyor because much of the overland conveyor system would be installed above ground and would not require substantial grading or land disturbance. In addition, unlike the Edison Road truck and conveyor options, the North American Cutoff Road conveyor options have the potential to adversely affect an identified wildlife movement corridor, the Santa Monica Mountains-Sierra Madre Landscape Linkage.

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TABLE 4-8
BIOLOGICAL RESOURCES COMPARISON TABLE

Route	Special-status Plants[1]	Special-Status Wildlife[1]	Sensitive Habitat/Communities	Wildlife Movement Corridor	Nesting Habitat	**Drainage Crossings**	Protected Trees	Vernal Pools
Woolsey Canyon Road Truck Route	None	None	None	None	None	None	None	None
Edison Road Truck Route*	• Slender mariposa lily (*Calochortus clavatus* var. *gracilis*) • Santa Susana tarplant (*Deinandra minthornii*) • Chaparral nolina (*Nolina cismontane*)	• California gnatcatcher (*Polioptila californica californica*) • Blacktailed jackrabbit (*Lepus californicus*) • Los Angeles little pocket mouse (*Perognathus longimembris brevinasus*) • Vernal pool fairy shrimp (*Branchinecta lynchi*) • Riverside fairy shrimp (*Streptocephalus woottoni*)	• Venturan Coastal Sage Scrub • Sandstone Outcrops	None	Present	Arroyo Simi and one unnamed drainage	Oak trees (*Quercus berberidifolia*)	Potentially Present
Edison Road Overland Conveyor	Same species as identified for Edison Road Truck Route	Same species as identified for Edison Road Truck Route	• Venturan Coastal Sage Scrub • Sandstone Outcrops	None	Present	Arroyo Simi and one unnamed ephemeral drainage	Oak trees (*Quercus berberidifolia*)	Potentially Present
North American Cutoff Road Overland Conveyor	Same species as identified for Edison Road Truck Route	Same species as identified for Edison Road Truck Route	• Venturan Coastal Sage Scrub • Sandstone Outcrops • Riparian Forest (potentially within footprint)	Present	Present	Arroyo Simi and two unnamed ephemeral drainages	Oak trees (*Quercus berberidifolia*)	Potentially Present
North American Cutoff Road Aerial Conveyor	Same species as identified for Edison Road Truck Route	Same species as identified for Edison Road Truck Route	• Venturan Coastal Sage Scrub • Sandstone Outcrops • Riparian Forest (potentially within footprint)	Present	Present	Arroyo Simi and two unnamed ephemeral drainages	Oak trees (*Quercus berberidifolia*)	Potentially Present

[1] Special-status plant and wildlife species included in this table do not represent a complete list of species that could be impacted by the transportation routes. Additional biological field surveys are recommended to verify habitat suitability for special-status species and appropriate focused species surveys.

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With respect to biological resources, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. Woolsey Canyon Road Truck Route
2. North American Cutoff Road Overland Conveyor
3. North American Cutoff Road Aerial Conveyor
4. Edison Road Overland Conveyor
5. Edison Road Truck Route

4.2.3 Cultural Resources Comparison

Disturbance of cultural resources would primarily occur during construction. Accordingly, the Woolsey Canyon Road Truck Route is expected to have no adverse effects on cultural resources because the route would not require construction.

The Edison Road and North American Cutoff Road options have the potential to disturb previously recorded archeological resources that exist within the approximate route delineation for each potential option. In addition, previously unearthed resources may be discovered during construction of the routes. On average, the archeological sensitivity of the Edison Road and North American Cutoff Road transportation routes is considered moderately sensitive for each analyzed option. Similar types of resources have been located within the Edison Road and North American Cutoff Road routes, including prehistoric lithic scatters, lithic tools, projectile point fragments, fire-cracked rock, fired-cracked manos, and a hammerstone. Rail Site 2B contains a known historical resource, the Corriganville Movie Ranch, which is eligible for listing in the National Register and California Register. The Edison Road and North American Cutoff Road transportation options would traverse geological units with low to high paleontological sensitivity. The Edison Road Truck Route would disturb the largest quantity of land and would therefore have a greater potential to disturb previously unearthed cultural and paleontological resources. The overland conveyor options would disturb substantially less land when compared to the Edison Road Truck Route and North American Cutoff Road Aerial Conveyor because much of the overland conveyor system would be installed above ground and would not require excavation and therefore would be less likely to unearth previously undiscovered cultural and paleontological resources. **Table 4-9** compares the cultural resources associated with each potential option analyzed.

With respect to cultural resources, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Overland Conveyor
3. North American Cutoff Road Overland Conveyor
4. North American Cutoff Road Aerial Conveyor
5. Edison Road Truck Route

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TABLE 4-9
CULTURAL RESOURCES COMPARISON TABLE

Route Option	Recorded Archeological Resources	Archeological Sensitivity	Paleontological Sensitivity
Woolsey Canyon Road Truck Route	None	None	None
Edison Road Truck Route	Two archaeological sites (CA-VEN-734 and -1420) and five prehistoric isolated artifacts (P-56-100285, -100295, -100318, -100319, and -100320). Resources include prehistoric lithic scatters with flakes, lithic tools, fire-cracked rock, fired-cracked manos, and a hammerstone.	Contains areas of high sensitivity Moderately sensitive on average	Traverses geological units with low to high paleontological sensitivity
Edison Road Overland Conveyor	One archaeological site (CA-VEN-734) Resources include prehistoric lithic scatters with flakes, lithic tools, fire-cracked rock, fired-cracked manos, and a hammerstone.	Contains areas of high sensitivity Moderately sensitive on average	Traverses geological units with low to high paleontological sensitivity
North American Cutoff Road Overland Conveyor	One archaeological site (CA-VEN-655) consisting of a lithic scatter with fire-affected rock, a projectile point fragment, and a mano fragment. Rail Site 2B contains site P-56-152383, the Corriganville Movie Ranch, which has been found eligible for listing in the National Register and California Register.	Contains areas of high sensitivity Moderately sensitive on average	Traverses geological units with low to high paleontological sensitivity
North American Cutoff Road Aerial Conveyor	Three archaeological sites, CA-VEN-655, -729 and -896, consisting of lithic scatters and a historic-period segment of a wagon road. Rail Site 2B contains site P-56-152383, the Corriganville Movie Ranch, which is eligible for listing in the National Register and California Register.	Contains areas of high sensitivity Moderately sensitive on average	Traverses geological units with low to high paleontological sensitivity

4.2.4 Energy Consumption Comparison

The Woolsey Canyon Road Truck Route would not require construction, and therefore would not consume energy for construction or decommissioning. The Edison Road and North American Cutoff Road routes would require construction and decommissioning. Construction of Edison Road Truck Route and associated Truck Site 1 would consume the most fuel at a total of 478,287gallons of diesel and 17,962 gallons of gasoline. Construction of the Edison Road Overland Conveyor and Truck Site 1 would consume the second largest quantity of fuel at a total of 175,323 gallons of diesel and 10,291 gallons of gasoline, which is approximately 74 percent less fuel than consumed for construction of the Edison Road Truck Route. The North American Cutoff Road Overland and Aerial Conveyor options would consume significantly less fuel during construction as shown in **Table 4-10**. Construction of the North American Cutoff Road Overland Conveyor would consume approximately 80 percent less fuel than construction of the Edison Road Truck Route and 83 percent less fuel than construction of the North American Cutoff Road Aerial Conveyor option.

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During operations, the North American Cutoff Road Overland Conveyor and the North American Cutoff Road Aerial Conveyor options would consume the most fuel at a maximum of 3,214,850 gallons of diesel per year due to freight train hauling. The Edison Road Truck Route and Edison Road Overland Conveyor options would consume the second largest quantity of the fuel at a maximum of 1,414,329 gallons of diesel per year. The Woolsey Canyon Road Truck Route option would consume the lowest quantity of fuel at approximately, 1,404,364 gallons of diesel per year. The Woolsey Canyon Road and Edison Road Truck routes would not use electricity during operation. The Edison Road Overland Conveyor and North American Cutoff Road Overland Conveyor options would consume the most electricity during operations at 440,160 kWh/month each. The North American Cutoff Road Aerial Conveyor would require significantly less electricity to operate at 58,968 kWh/month.

TABLE 4-10
ENERGY CONSUMPTION COMPARISON TABLE

	Construction		Operations		
Route Option	**Diesel (gallons)**	**Gasoline (gallons)**	**Diesel (gallons)**	**Gasoline (gallons)**	**Electricity (kWh/Month)**
Woolsey Canyon Road Truck Route	0	0	1,404,364	0	0
Edison Road Truck Route	478,287	17,962	1,414,329	0	0
Edison Road Overland Conveyor & Truck Site 1	175,323	10,291	1,414,329	0	440,160
North American Cutoff Road Overland Conveyor & Rail Site 2B	96,545	8,307	3,118,305	0	440,160
North American Cutoff Road Aerial Conveyor & Rail Site 2B	82,573	10,241	3,118,305	0	58,968

With respect to energy consumption, the routes with the lowest consumption of energy (in order of least consumption to most consumption) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Overland Conveyor
3. Edison Road Truck Route
4. North American Cutoff Road Aerial Conveyor
5. North American Cutoff Road Overland Conveyor

4.2.5 Land Use Comparison

The Woolsey Canyon Road Truck Route is an existing roadway system and would not require new construction or decommissioning. The use of Woolsey Canyon Road as a haul route would not conflict with General Plan land use designations or zoning. All other potential options would

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potentially conflict with applicable General Plan land use designations and zoning and would likely require a zone change to implement. **Table 4-11** compares the land use compatibility for each potential option.

TABLE 4-11
LAND USE COMPATIBILITY COMPARISON TABLE

Route Option	Jurisdiction	Land Use Designation	Zoning	Compatibility
Woolsey Canyon Road Truck Route	Ventura County	Numerous land use designations and zones including: Residential, Commercial, Industrial, Manufacturing, Open Space, Public Facilities, and Transportation Corridor		**Compatible:** No changes to the current land use or zoning would be needed.
	Los Angeles County			
Edison Road Truck Route	Ventura County	• Open Space	• Open Space (OS-160ac) • Rural Agriculture (RA-5ac)	**Potentially Incompatible:** A zone change would be required to construct this route.
	City of Simi Valley	• Open Space • Medium Density Residential • Business Park	• Open Space • Water Storage Facility • Residential (Medium Density) • BP - Business Park	
Edison Road Overland Conveyor	Ventura County	• Open Space	• Open Space (OS-160ac; OS-160ac/MRP)	**Potentially Incompatible:** A zone change would be required to construct this route.
	City of Simi Valley	• Open Space • Business Park	• Open Space • BP - Business Park	
North American Cutoff Road Overland Conveyor	Ventura County	• Open Space (10ac min.) • Existing Community (Santa Susana)	• Agricultural Exclusive (AE-40ac) • Open Space (OS-160ac; OS-40ac; OS-10ac; OS-20ac) • Residential Estate (RE-10,000 sf	**Potentially Incompatible:** A zone change would be required to construct this route.
	City of Simi Valley	• Community Park • Commercial Recreation • Industrial	• Open Space • Commercial Recreation • Light Industrial	
North American Cutoff Road Aerial Conveyor	Ventura County	• Open Space (10ac min.) • Existing Community (Santa Susana)	• Agricultural Exclusive (AE-40ac) • Open Space (OS-160ac; OS-40ac; OS-10ac; OS-20ac) • Residential Estate (RE-10,000 sf	**Potentially Incompatible:** A zone change would be required to construct this route.
	City of Simi Valley	• Community Park • Commercial Recreation • Industrial	• Open Space • Commercial Recreation • Light Industrial	

With respect to land use, the routes with the fewest land use constraints (in order of fewest constraints to most constraints) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route

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3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

4.2.6 Noise Comparison

The Woolsey Canyon Road Truck Route would not require construction and therefore would not generate construction noise or noise associated with decommissioning. However, all other feasible transportation options would require construction and have sensitive receptors (residences) within 1,000 feet of construction activities. Sensitive receptors are located as close as 115 feet south of the Edison Road Truck Route and Truck Site 1 and 195 feet south of Rail Site 2B. None of the feasible transportation options would involve construction activities that take place outside the hours of 7:00 A.M. and 7:00 P.M. and would therefore not conflict with the construction noise regulations of the County of Ventura or City of Simi Valley. While vibration would be generated during the construction and decommissioning phases, none of the feasible transportation options are anticipated to significantly affect sensitive receptors with construction/decommissioning vibration.

During operations, all potential options would increase exterior noise levels. The Woolsey Canyon Road Truck Route is anticipated to generate a readily perceptible increase in noise between Valley Circle Boulevard and Knapp Ranch Road, which is defined as in increase of 5 dBA over existing ambient conditions. None of the other feasible transportation options are anticipated to generate a readily perceptible increase in noise. However, an increase in noise in general would occur for all feasible transportation options during the operational phase. Noise generated from the conveyor systems would be minimal and incapable of creating a nuisance to sensitive receptors. The primary source of noise for the Edison Road truck and conveyor options would result from truck trips near/along Guardian Street and Truck Site 1, respectively. The primary source of noise for the North American Cutoff Road Conveyor options would result from an additional one to two freight trains per week arriving at and departing Rail Site 2B. **Table 4-12** compares the noise effects of each potential option.

With respect to noise, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. North American Cutoff Road Aerial Conveyor
2. North American Cutoff Road Overland Conveyor/Edison Road Overland Conveyor
3. Edison Road Truck Route
4. Woolsey Canyon Road Truck Route

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TABLE 4-12
NOISE COMPARISON TABLE

	Construction			Operations			
Route	**Construction Noise Generated Outside the Hours of 7:00 A.M. and 7:00 P.M.**	**Maximum Vibration Decibel (VdB) at 100 feet**	**Sensitive Receptors within 1,000 feet**	**Future (2032) Without Traffic Volumes (dBA CNEL)[a, b]**	**Future (2032) With Project Traffic Volumes (dBA CNEL)[a, b]**	**Increase[c]**	**Conveyor Noise Level at nearest Sensitive Receptor (dBA)**
Woolsey Canyon Road Truck Route	No	0	**Yes**: Residences along Woolsey Canyon Road	52.2	57.4	5.2	Not Applicable
Edison Road Truck Route	No	69	**Yes:** Residence 115 feet south of route, and residences along Tapo Canyon Boulevard.	67.3	68.0	0.7	Not Applicable
Edison Road Overland Conveyor	No	69	**Yes:** Residence 115 feet south of Truck Site 1, and residences along Tapo Canyon Boulevard.	67.3	68.0	0.7	33
North American Cutoff Road Overland Conveyor	No	69	**Yes:** 195 feet to the south of Rail Site 2B	Anticipated increase in noise due to increased daily freight train trips and/or truck trips from Rail Site 2B			43
North American Cutoff Road Aerial Conveyor	No	69	**Yes:** 195 feet to the south of Rail Site 2B	Anticipated increase in noise due to increased daily freight train trips and/or truck trips from Rail Site 2B			20

[a] Values represent noise levels at 100 feet from the centerline of the roadway.
[b] Values shown only for the roadway segments most adversely effected traffic noise generation.
[c] The operations threshold is a 5 dBA increase in exterior noise (see Section 3.6).

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4.2.7 Traffic Comparison

During operations, the Woolsey Canyon Road Truck Route and Edison Road truck and conveyor options would generate a maximum of 192 one-way trips to haul material from the SSFL site. However, the Woolsey Canyon Truck Route is anticipated to significantly affect more roadway segments and intersections than the Edison Road truck and conveyor options (see **Table 4-13**). Potential traffic effects on roadway segments and intersections could be mitigated if truck hauling activities were required to occur outside of peak traffic periods. Signalization of some of the currently unsignalized locations could also mitigate traffic that may occur at the affected intersections. The North American Cutoff Road conveyor options would not generate truck haul trips during operations. Thus, the North American Cutoff Road conveyor options would not generate traffic during operations.

TABLE 4-13
TRAFFIC COMPARISON TABLE

Route	Total Daily Truck Trips (one way)	Affected Roadways and Intersections
Woolsey Canyon Road Truck Route	192	• Intersections at the SR 118/Topanga Canyon Boulevard interchange • The intersection at Topanga Canyon Boulevard/US-101 Northbound Ramps • The intersection of Valley Circle Boulevard/Roscoe Boulevard • The intersection of Topanga Canyon Boulevard /Roscoe Boulevard • The intersection of Valley Circle Boulevard/Woolsey Canyon Road • Five roadway segments on Valley Circle Boulevard and Roscoe Boulevard
Edison Road Truck Route	96	All the intersections listed in the above row would be impacted but to a lesser degree
	96	Tapo Canyon Road, south of the SR 118 interchange
Edison Road Overland Conveyor	192	Tapo Canyon Road, south of the SR 118 interchange
North American Cutoff Road Overland Conveyor	0	None
North American Cutoff Road Aerial Conveyor	0	None

With respect to traffic, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. North American Cutoff Road Overland Conveyor/North American Cutoff Road Aerial Conveyor
2. Edison Road Overland Conveyor
3. Edison Road Truck Route

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4. Woolsey Canyon Road Truck Route

5.0 Summary

Table 5-1 presents a comparison of the feasibility of each potential option, based on each potential option's ranking in each feasibility category evaluated. The potential options are ranked from 1 to 5 with 1 being the most feasible and 5 being the least feasible. It should be noted that the rankings below are based on how each potential option compared to the other potential options for each criterion evaluated. No weighting was assigned to individual categories or routes; as such, this analysis assumes all criteria are weighted equally.

TABLE 5-1
COMPARISON OF FEASIBILITY CRITERIA

Criteria	Woolsey Canyon Road Truck Route	Edison Truck Road	Edison Overland Conveyor	North American Cutoff Road Overland Conveyor	North American Cutoff Road Aerial Conveyor
Land Access	1	2	3	4	4
Technological Feasibility	1	2	2	2	2
Rail Logistics	1	1	1	2	2
Permitting Constraints	1	2	3	4	5
Implementation Schedule	1	1	2	2	2
Cost	1	1	2	4	4
Total	**6**	**10**	**13**	**18**	**20**

As shown in Table 5-1, in terms of feasibility, the most feasible routes to implement (in order of more feasible to less feasible) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Truck Route
3. Edison Road Overland Conveyor
4. North American Cutoff Road Overland Conveyor
5. North American Cutoff Road Aerial Conveyor

It should be noted that this ranking is unaffected by cost.

Table 5-2 presents a comparison of potential adverse environmental effects. The potential options are ranked from 1 to 5 with 1 being the least adverse to environmental resources and 5 being the most adverse.

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TABLE 5-2
COMPARISON OF POTENTIAL ADVERSE ENVIRONMENTAL EFFECTS

Environmental Issue	Woolsey Canyon Road Truck Route	Edison Truck Road	Edison Overland Conveyor	North American Cutoff Road Overland Conveyor	North American Cutoff Road Aerial Conveyor
Air Quality (construction)	1	4	5	3	2
Air Quality (operation)	2	1	1	3	4
Biological Resources	1	5	4	2	3
Cultural Resources	1	5	2	3	4
Energy Consumption	1	3	2	5	4
Land Use	1	2	3	4	5
Noise	4	3	2	2	1
Traffic	4	3	2	1	1
Total	**15**	**26**	**21**	**23**	**24**

As shown in Table 5-2, in terms of potential effects and issues related to environmental resources, the routes with the fewest adverse environmental effects (in order of least adverse to most adverse) would be:

1. Woolsey Canyon Road Truck Route
2. Edison Road Overland Conveyor
3. North American Cutoff Road Overland Conveyor
4. North American Cutoff Road Aerial Conveyor
5. Edison Road Truck Route

6.0 Preparers

This report was prepared by ESA and four subconsultants, KOA Corporation, Rail Pros, Agudio/Leitner-Poma, and FLSmidth & Co.

ESA prepared the background, introduction, environmental analysis, and comparison analyses.

KOA Corporation provided the engineering and cost analysis for developing Edison Road Truck Route.

FLSmidth &Co. provided the engineering and cost analysis for developing the overland conveyor options.

Agudio/Leitner-Poma provided the engineering and cost analysis for developing the aerial conveyor options.

RailPros Inc. provided the engineering and cost analysis for developing the rail transfer sites.

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SANTA SUSANA FIELD LABORATORY PROJECT

Transportation Feasibility Analysis

Volume 2 Appendices

Prepared for
Department of Toxic Substances Control

May 2017

Draft

Santa Susana Field Laboratory Project

Transportation Feasibility Analysis

Volume 2 Appendices

Prepared for
Department of Toxic Substances Control

May 2017

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APPENDIX A

Real Estate Data

Price Per Acre Calculations

MLS #	APN	Address	Acres	Asking Price	Price per Acre	Zoning
215006381	6450020020	5750 Rainey Road	1.49	$ 249,000	$167,114	RE-10,000 sqft
214030890		Santa Susana Pass (3 parcels)	0.41	$ 69,000	$168,293	OS-10 Acre or OS-160
SR15097535	6490340070	801 Box Canyon Road	2.7	$ 249,000	$92,222	RE-1 Acre
SR15123149		50 Santa Susana Pass Road	0.52	$ 39,000	$75,000	OS-10 Acre or OS-160
				Total	**$502,629**	

Average Price Per Acre **$125,657.25**

5750 Rainey Road, Simi Valley, CA 93063, US

$249,000

Map Property | Share Listing | Ask Question | Schedule Showing | Request More Photos

Summary

Full Baths: 0
Three Quarter Baths: 0
Half Baths: 0
Quarter Baths: 0
Style: Lots and Land

Agent Contact

Debbie Nicoll
Ask Question
Schedule Showing
Click for Phone Number
Click to Email

Moving Quotes

Type of Move
- Select Move Type -

Move date
Nov 11 2015

Moving From Zip

Moving To Zip

Size of Move
- Select a Weight -

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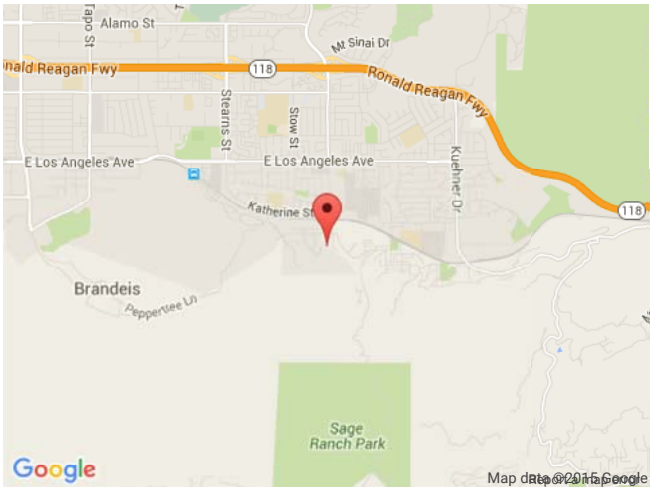

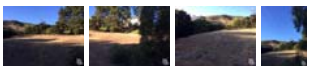

Resources

- View Area Foreclosures
- Search More Area Listings!

Broker Contact

Troop Real Estate
1308 Madera Rd. Ste 2B
Simi Valley, CA, 93065
US
Brian Troop
Website

Remarks

Seller says bring all offers and Seller with carry the loan with 50% or more of a down payment. Here's an opportunity to build your own estate home with plenty of surrounding land, set back at the end of a cul de sac with well placed oak trees on the lot. Almost 1 1/2 acres, surrounded by custom homes and newer subdivisions. Per the County of Ventura the property zoning does allows for 4.5 horses and 22 goats and 650 sq. ft. of open parking to include utility vehicles. All utilities including water, sewer, electricity and gas are located in the street to the property, Seller has soils report, geological report and survey. Property is being sold as-is and seller makes no warranties. Buyer are to perform their own inspections and investigations.

Details

MLS#: 215006381
Price: $249,000

Style: Lots and Land
Baths Full: 0
Three Quarter Baths: 0
Baths Half: 0
Quarter Baths: 0

County: Ventura
Subdivision: Not Applicable-SVE
Tax Fee: 0.00

Information is believed to be accurate but should not be relied upon without verification.
Data Provided by Conejo Simi Moorpark Association of REALTORS
Last updated: 2015-10-25T13:37:57.000-07:00.
Privacy Policy

0 Santa Susana Pass, Simi Valley, CA 93063, US

$69,000

Map Property | Share Listing | Ask Question | Schedule Showing | Request More Photos

Summary

Full Baths: 0
Three Quarter Baths: 0
Half Baths: 0
Quarter Baths: 0
Style: Lots and Land

Agent Contact

Laurie Taylor
Ask Question
Schedule Showing
Click for Phone Number
Click to Email

Moving Quotes

Type of Move
- Select Move Type -

Move date
Nov 11 2015

Moving From Zip

Moving To Zip

Size of Move
- Select a Weight -

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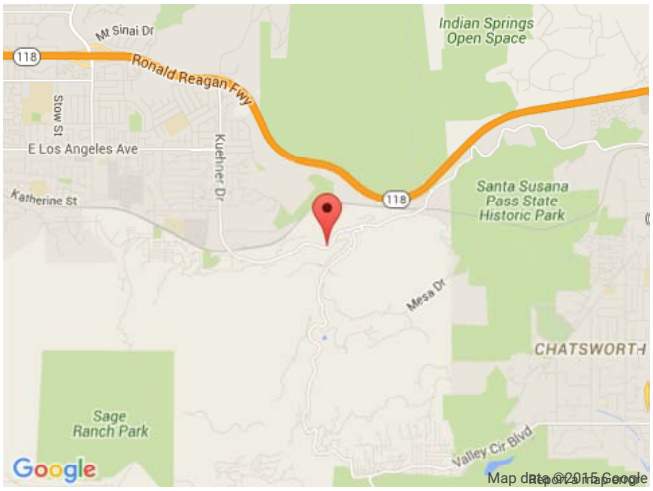

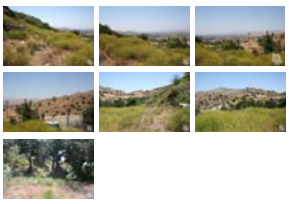

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Remarks

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Details

MLS#: 214030890
Price: $69,000

Style: Lots and Land
Baths Full: 0
Three Quarter Baths: 0
Baths Half: 0
Quarter Baths: 0

County: Ventura
Subdivision: Not Applicable-SVE
Tax Fee: 0.00

Broker Contact

Troop Real Estate Inc.
3200 E Los Angeles Ave
Simi Valley, CA, 93065
US
Brian Troop
Website

Information is believed to be accurate but should not be relied upon without verification.
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Simi Valley, Ventura County, California Land For Sale - 2.7 Acres

PHOTOS

Mountain and canyon view vacant corner 2.7 acre lot - located next to large home at 801 Box Canyon Road.

Email GRAHAM FIRRELL

Click for phone number

Visit website

Property type:	Land
Parcel Size:	2.7 Acres
Price:	$249,000
MLS or other ID:	SR15097535

Check your free credit score

Agent: GRAHAM FIRRELL

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Click for phone number

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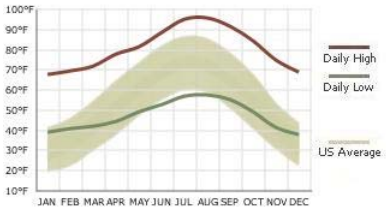
Property
City: Simi Valley

Agent/Broker Information
Website URL: Click here

HISTORICAL WEATHER

Average Temperature



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50 SANTA SUSANA PASS Road, Simi Valley, CA 93063, US

$39,000

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Agent Contact

Bob Wood
Ask Question
Schedule Showing
Click for Phone Number
Click to Email

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Type of Move
- Select Move Type -

Move date
Nov 11 2015

Moving From Zip

Moving To Zip

Size of Move
- Select a Weight -

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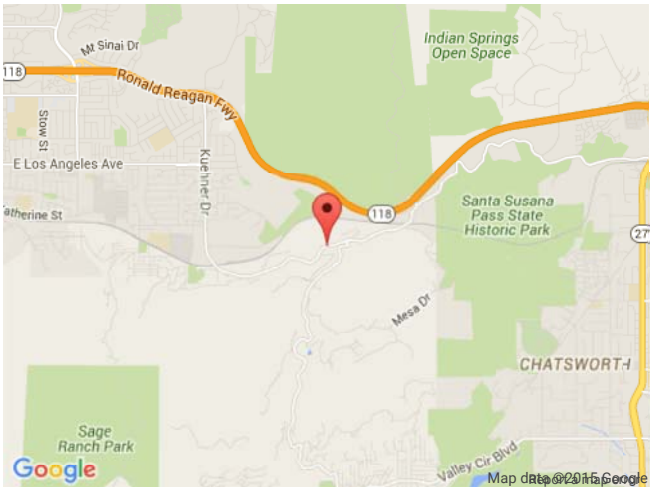

Remarks

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Details

MLS#: SR15123149
Price: $39,000

County: Ventura
Subdivision: Santa Susana Knolls (166)

Resources

- View Area Foreclosures
- Search More Area Listings!

Broker Contact

RE/MAX Olson & Associates,Inc.
11141 Tampa Ave.
Porter Ranch, CA, 91326
US
Todd Olson
Click for Phone Number
Click to Email
Website

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APPENDIX B

Cost Estimate Details

Summary of Development Costs for all Alternatives

Option	Route	Environmental Review	Construction	Land Acquisition	Permitting	Decommissioning	Total
1	**Woolsey Canyon Road Truck Route**	$ -	$ -	$ -	$ -	$ -	**$ -**
2	**Edison Road Truck Route**	**$ 2,000,000**	**$ 12,427,167**	**$ 2,671,200**	**$ 50,000**	**$ 600,000**	**$ 17,748,367**
3	**Edison Road Overland Conveyor**	**$ 2,000,000**	**$ 61,946,250**	**$ 3,696,000**	**$ 50,000**	**$ 12,389,250**	**$ 80,081,500**
	Conveyor		$ 56,052,000			$ 11,210,400	**$ 67,262,400**
	Truck Transfer Site		$ 5,894,250			$ 1,178,850	**$ 7,073,100**
4	**North American Cutoff Road Overland Conveyor**	**$ 2,000,000**	**$ 68,491,136**	**$ 2,083,200**	**$ 50,000**	**$ 13,698,227**	**$ 86,322,563**
	Conveyor		$ 41,346,000			$ 8,269,200	**$ 49,615,200**
	Rail Transfer Site		$ 27,145,136			$ 5,429,027	**$ 32,574,163**
5	**North American Cutoff Road Aerial Conveyor**	**$ 2,000,000**	**$ 40,097,636**	**$ 2,083,200**	**$ 50,000**	**$ 8,019,527**	**$ 52,250,363**
	Conveyor		$ 12,952,500			$ 2,590,500	**$ 15,543,000**
	Rail Transfer Site		$ 27,145,136			$ 5,429,027	**$ 32,574,163**

Notes:

Costs for development of the rail site were provided by RailPros.
Costs for development of the truck site and Edison Haul Road were provided by KOA Corporation.
Costs for development of the overland conveyor options were provided by FLSmidth & Co.
Costs for development of the aerial conveyor option were provided by Leitner S.pA. Agudio.
Costs for environmental review and permitting were provided by ESA and are allocations based on previous experience with other projects.
Decommissioning costs for the Edison Truck Route were provided by KOA Corporation.
Decommissioning costs for all other alternatives are estimated to be 20% of the construction costs.

NACR Road Overland Conveyor

Item	Description	Cost
1	Pipe Conveyor	$ 14,640,000
2	Elevated Sections Support Structures	$ 3,840,000
3	Electrical Controls, Motor VFDs, Switches, Transformer, PLC, etc.	$ 1,800,000
4	Estimated Freight	$ 906,000
5	Estimated Installation and Commissioning	$ 7,320,000
6	Road Improvement / Corridor Preparation *(double lane dirt road, no wall, and off roadway service road)*	$ 6,060,000
7	Conveyor Intrusion Protection Guarding	$ 480,000
8	Concrete Footers and Foundations	$ 900,000
9	Concrete Road Barricade	$ 600,000
10	Crushing / Feeding Station	$ 4,200,000
11	Discharge Surge Bin	$ 600,000
	Pipe Conveyor System Total	**$ 41,346,000**

NACR Road Aerial Conveyor

Item	Description	Cost
1	Conveyor System - Engineering services and training	$ 1,000,000
2	Towers (body structure and heads + ropes + saddles + buckets	$ 3,500,000
3	Loading and offloading stations (excluding civil works)	$ 2,750,000
4	Electrical Controls, Motor VFDs, Switches, Transformer, PLC, etc.	$ 850,000
5	Supervision to Installation and Commissioning (including rope stinging) - Teams AG1-AG7 in Agudio Planning	$ 950,000
6	Estimated cost for Manpower for erection and installation - Team CL1. CL2, CL3 in Agudio planning	$ 1,700,000
7	Estimated Civil works (foundations) for towers and stations	$ 1,402,500
8	Conveyor bucket cleaning system	$ 800,000
	Aerial Conveyor System Total	**$ 12,952,500**

Edison Road Overland Conveyor

Item	Description	Cost
1	PC-001 Pipe Conveyor	$ 13,764,000
2	Elevated Sections Support Structures	$ 4,080,000
3	Electrical Controls, Motor VFDs, Switches, Transformer, PLC, etc.	$ 1,920,000
4	Estimated Freight	$ 918,000
5	Estimated Installation and Commissioning	$ 7,200,000
6	Road Improvement / Corridor Preparation *(double lane dirt road, no wall, and off roadway service road)*	$ 10,200,000
7	Conveyor Intrusion Protection Guarding	$ 330,000
8	Concrete Footers and Foundations	$ 1,020,000
9	Concrete Road Barricade	$ 420,000
10	Crushing / Feeding Station	$ 4,200,000
11	Discharge Surge Bin	$ 600,000
13	Uphill loading station	$ 1,800,000
14	Increased capital for uphill transfer (drives, structure, idlers etc)	$ 3,600,000
15	Downhill unloading station, washing and drying station	$ 6,000,000
	Pipe Conveyor System Total	**$ 56,052,000**

Edison Haul Road Development

Activity	Per Unit	Units	Total
Grading and Excavation	$ 130	CY	$ 8,666,667
Drainage	-	LS	$ 45,000
Asphalt Pavement	$ 120	TONS	$ 1,728,000
Retaining Walls	$ 50	sq.ft.	$ -
Overhead & Misc	-	LS	$ 375,000
Topo Survey	-	LS	$ 60,000
Engineering	-	LS	$ 450,000
Construction Engineering	-	LS	$ 375,000
Maintenance	$ 52,500	year	$ 577,500
Project Adminstration	-	LS	$ 150,000
TOTAL CONSTRUCTION			**$ 12,427,167**

Decomissioning	lump sum	$600,000

Rail Site Development

Item Description	Est. Quantity	Unit	Total Cost
Mobilization			$ 1,884,676
Bonds & Insurance			$ 471,168
Railroad Flagging	50	day	$ 66,924
Trackwork	10,700	feet	$ 3,222,391
Turnouts	5	each	$ 669,240
Railroad subballast	10,700	cubic yards	$ 656,413
Tie-In at SCRRA Connection	1	lump sum	$ 111,540
Railroad Signaling	1	lump sum	$ 557,700
Clearing and Grubbing	11.9	acre	$ 106,358
Earthwork (assumed 2' cuts and fills across paved area+retaining wa	24,741	cubic yards	$ 827,874
Retaining Wall (adjacent to buildings/movie set location. Assume 5'	1,000	linear feat	$ 669,240
Railroad Bridge PCCB (adjacent to stormwater facilities)	120	feet	$ 803,088
Culvert Extensions	1	each	$ 22,308
Roadway Entrance (driveway approach, signage, guard shack, etc)	1	each	$ 55,770
Perimeter Security Fencing (Chain Link)	9,300	linear feat	$ 155,598
Site Power	1	lump sum	$ 167,310
Site Lighting	1	lump sum	$ 1,115,400
Stormwater Conveyance	1	lump sum	$ 557,700
Stormwater Treatment Facilities	1	lump sum	$ 1,673,100
Water Connection	1	lump sum	$ 55,770
Sewer Connection	1	lump sum	$ 167,310
Utility Relocation (eg, fiber optic in SCRRA ROW, unkonwn utilities)	1	lump sum	$ 446,160
Temporary Office/Job Shack	1	each	$ 55,770
Reconstruct/Relocate Existing Storwater Structures	1	lump sum	$ 2,230,800
Conveyor (elevated, enclosed galleries, 36" wide belt, max 1000 TP	250	linear feat	$ 557,700
Surge Bin (500 ton cap'y)	1	each	$ 167,310
Loading Shed with Dust Control	1	each	$ 2,788,500
Railcar Mover (ony required for gondolas)	1	each	$ 223,080
Ventura County/SCRRA ROW Lease	LS	lump sum	$ 89,232
Project Management (% of Capital Cost Subtotal)	0.03	lump sum	$ 1,215,786
Plans, Specifications, & Engineering	0.08	lump sum	$ 2,810,808
Railroad Coordination	0.0025	lump sum	$ 89,232
Construction Management	0.07	lump sum	$ 2,453,880
			$ 27,145,136

Truck Site Development

Item	Description	Qty	Unit	Unit Cost	Total Cost
1	Mobilization	1	LS	$ 50,000	$ 75,000
2	Construction Survey and Monumentation	1	LS	$ 25,000	$ 37,500
3	Stormwater Protection Plan	1	LS	$ 20,000	$ 30,000
4	Clearing and Grubbing	1	LS	$ 25,000	$ 37,500
5	Site Grading	16940	CY	$ 25	$ 635,250
6	Perimeter Fence	2500	LF	$ 20	$ 75,000
7	Security Facilities/Site Office	1	LS	$ 800,000	$ 1,200,000
8	Containment Facilities	1	LS	$ 200,000	$ 300,000
9	Storm Water Collection, Treatment, Disposal Facilities	1	LS	$ 200,000	$ 300,000
10	Aggregate Base	17152	TONS	$ 35	$ 900,000
11	Asphalt Pavement	7547	TONS	$ 75	$ 849,000
12	Curb and Gutter	3000	LF	$ 35	$ 157,500
13	Striping, signing, markings	1	LS	$ 25,000	$ 37,500
14	Drive Access	1	LS	$ 50,000	$ 75,000
15	Gates	1	LS	$ 30,000	$ 45,000
16	Lighting	1	LS	$ 250,000	$ 375,000
17	Truck Wheel Wash	1	LS	$ 10,000	$ 15,000
18	Engineering	1	LS	$ 200,000	$ 300,000
19	Construction Management and Inspection	1	LS	$ 250,000	$ 375,000
20	Testing	1	LS	$ 50,000	$ 75,000
					$ 5,894,250

Operational Costs

Woolsey Canyon Road Truck Route (15 years)		Cost/Ton	Volume (Tons)		Total
Excavation into truck	$	2.13	3,784,500	$	8,060,985
Nonhaz (480 miles roundtrip - truck)	$	40.80	2,371,500	$	96,757,200
Hazardous (620 miles roundtrip - truck)	$	105.40	1,212,000	$	127,744,800
Radiologic (900 miles roundtrip - truck)	$	153.00	201,000	$	30,753,000
Truck tipping fees per ton - Nonhazardous	$	43.40	2,371,500	$	102,923,100
Truck tipping fees per ton - Hazardous	$	58.62	1,212,000	$	71,047,440
Dump soil, clean truck and return, or load	$	5.00	2,023,500	$	10,117,500
Total Cost				**$**	**447,404,025**

Woolsey Canyon Road Truck Route (45 months)		Cost/Ton	Volume (Tons)		Total
Excavation / Load Truck	$	2.13	1,218,000	$	2,594,340
Nonhaz (480 miles roundtrip - truck)	$	40.80	538,500	$	21,970,800
Hazardous (620 miles roundtrip - truck)	$	105.40	505,500	$	53,279,700
Radiologic (900 miles roundtrip - truck)	$	153.00	174,000	$	26,622,000
Truck tipping fees per ton - Nonhazardous	$	43.40	538,500	$	23,370,900
Truck tipping fees per ton - Hazardous	$	58.62	505,500	$	29,632,410
Dump soil, clean truck and return, or load	$	5.00	483,000	$	2,415,000
Total Cost				**$**	**159,885,150**

Edison Road Truck Route		Cost/Ton	Volume (Tons)		Total
Excavation / Load Truck	$	2.13	2,566,500	$	5,466,645
Nonhaz (480 miles roundtrip - truck)	$	40.80	1,833,000	$	74,786,400
Hazardous (620 miles roundtrip - truck)	$	105.40	706,500	$	74,465,100
Radiologic (900 miles roundtrip - truck)	$	153.00	27,000	$	4,131,000
Truck tipping fees per ton - Nonhazardous	$	43.40	1,833,000	$	79,552,200
Truck tipping fees per ton - Hazardous	$	58.62	706,500	$	41,415,030
Dump soil, clean truck and return, or load	$	5.00	1,540,500	$	7,702,500
Subtotal (11 years Edison Road operation)				*$*	*287,518,875*
45 months Woolsey Canyon Road operation				$	159,885,150
Total Operational Cost				**$**	**447,404,025**

Operational Costs

Edison Road Overland Conveyor (11 years)		Cost/Ton	Volume (Tons)		Total
Excavation / Load Truck	$	2.13	2,566,500	$	5,466,645
Load conveyor from stockpile	$	1.07	2,539,500	$	2,717,265
Conveyor Operation / Discharge	$	5.47	2,539,500	$	13,891,065
Nonhaz (480 miles roundtrip - truck)	$	40.80	1,833,000	$	74,786,400
Hazardous (620 miles roundtrip - truck)	$	105.40	706,500	$	74,465,100
Radiologic (900 miles roundtrip - truck)	$	153.00	27,000	$	4,131,000
Truck tipping fees per ton - Nonhazardous	$	43.40	1,833,000	$	79,552,200
Truck tipping fees per ton - Hazardous	$	58.62	706,500	$	41,415,030
Dump soil, clean truck and return, or load	$	5.00	1,540,500	$	7,702,500
Subtotal (11 years conveyor operation)				*$*	*304,127,205*
45 months Woolsey Canyon Road operation				$	159,885,150
Total Operational Cost				**$**	**464,012,355**

North American Cutoff Road Overland Conveyor		Cost/Ton	Volume (Tons)		Total
Excavation / Load Truck	$	2.13	2,566,500	$	5,466,645
Load conveyor from stockpile	$	1.07	2,539,500	$	2,717,265
Conveyor Operation / Discharge	$	5.14	2,539,500	$	13,053,030
Nonhaz (900 miles - rail)	$	90.00	1,833,000	$	164,970,000
Hazardous (1,550 miles - rail)	$	155.00	706,500	$	109,507,500
Radiologic (900 miles roundtrip - truck)	$	153.00	27,000	$	4,131,000
Rail tipping fees per ton - Nonhazardous	$	27.25	1,833,000	$	49,949,250
Rail tipping fees per ton - Hazardous	$	220.00	706,500	$	155,430,000
Dump soil, clean truck and return, or load	$	5.00	1,540,500	$	7,702,500
Subtotal (11 years conveyor operation)				$	512,927,190
45 months Woolsey Canyon Road operation				$	159,885,150
Total Operational Cost				**$**	**672,812,340**

North American Cutoff Road Aerial Conveyor		Cost/Ton	Volume (Tons)		Total
Excavation / Load Truck	$	2.13	2,566,500	$	5,466,645
Load conveyor from stockpile	$	1.07	2,539,500	$	2,717,265
Conveyor Operation / Discharge	$	5.10	2,539,500	$	12,951,450
Nonhaz (900 miles - rail)	$	90.00	1,833,000	$	164,970,000
Hazardous (1,550 miles - rail)	$	155.00	706,500	$	109,507,500
Radiologic (900 miles roundtrip - truck)	$	153.00	27,000	$	4,131,000
Rail tipping fees per ton - Nonhazardous	$	27.25	1,833,000	$	49,949,250
Rail tipping fees per ton - Hazardous	$	220.00	706,500	$	155,430,000
Dump soil, clean truck and return, or load	$	5.00	1,540,500	$	7,702,500
Subtotal (11 years conveyor operation)				$	512,825,610
45 months Woolsey Canyon Road operation				$	159,885,150
Total Operational Cost				**$**	**672,710,760**

Estimated Operating Assumptions - Overland Conveyor

Item	NACR Route	Edison Road Route
Annual Conveyor Throughput	185,000 cy/yr	185,000 cy/yr
Conveyor Annual Operating Hours	2520 hr/yr	2520 hr/yr
Electricity Cost	$0.08 /kWh	$0.08 /kWh
Average Running Power	1,600 kW1	2,030 kW1
Operator Loaded Labor Rate	50.00 $/hr	50.00 $/hr
Maintenance Loaded Labor Rate	50.00 $/hr	50.00 $/hr
Number of Operators per Operating Hour	1	1
Number of Maintenance People per Operating Hour	1	1
Maintenance Parts % of Equipment Cost2	4.00%	4.00%

Estimated Annual Operating Cost - Overland Conveyor

Component	NACR Route	Edison Road Route
Electric Power ($/yr)	$ 322,560	$ 409,248
Maintenance Parts ($/yr)	$ 588,720	$ 594,800
Operator Labor ($/yr)	$ 257,040	$ 257,040
Maintenance Labor ($/yr)	$ 257,040	$ 257,040
Total Annual Cost ($/yr)	$ 1,425,360	$ 1,518,128
Cost/CY (185,000 cy/year)	$ 7.70	$ 8.21
Cost/Ton	$ 5.14	$ 5.47

Estimated Operating Assumptions - Aerial Conveyor

Item	Assumptions
Conveyor Annual Operating Hours	2,520 hr/yr
Electricity Cost	$0.08 /kWh
Average Running Power	430 kW
Operator Loaded Labor Rate	50.00 $/hr
Maintenance Loaded Labor Rate	50.00 $/hr
Number of Operators per Operating Hour	2
Number of Maintenance People per Operating Hour	2
Maintenance Parts % of Equipment Cost	4.00%

Estimated Annual Operating Cost - Aerial Conveyor

Component	Cost (Annual)
Electric Power ($/yr)	$ 86,688
Maintenance Parts ($/yr)	$ 300,000
Operator Labor ($/yr)	$ 514,080
Maintenance Labor ($/yr)	$ 514,080
Total Annual Cost ($/yr)	$ 1,414,848
Cost/CY (185,000 cy/year)	$ 7.65
Cost/Ton	$ 5.10

Tipping Fees	Cost/Ton
Waste Mangement Arlington, OR Hazardous - Rail	$ 220.00
ECDC Clive, Utah Nonazardous - Rail	$ 27.25
Kettleman Hills Nonhazardous - Truck	$ 43.40
Kettleman Hills Hazardous - Truck	$ 58.62

APPENDIX C

Air Quality and GHG Calculations

Transportation Feasibility Study
Air Quality and GHG

Santa Susana Field Laboratory

Transportation Feasibility Study Appendix TOC & List of Tables

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Transportation Feasibility Study
Air Quality and GHG
Construction Emissions Assumptions

SSFL Transportation Feasibility Analysis
Woolsey Canyon Road Truck Route
Assumptions

The truck route via Woolsey Canyon Road to SR 118 or US 101 would begin at the east gate of the SSFL facility and use public roadways via the routes listed below. Construction of new roadways or widening of existing roadways would not be necessary to establish use of these roadways for haul routes .

Construction/Decommissioning Equipment and Workforce

No construction is necessary for this haul route, so no additional equipment or workforce would be necessary. This haul route, which consists of a public roadway, would not be decommissioned upon completion of cleanup activities.

SSFL Transportation Feasibility Study
Edison Road Truck Route
Assumptions

The proposed Edison Road Truck Route for SSFL remediation activities would be located along Edison Road, which is privately owned by a developer and operated by SCE via an easement. This haul route would operate as a private road, with a controlled access point at the south end (at the SSFL site) and north end, where Edison Road would be extended to access Guardian Street. This route would not cross any public roadways before accessing Guardian Street.

This roadway would be located within a corridor that roughly parallels the existing Edison Road, an unpaved single-lane facility. Because of the need to provide a roadway that is adequate for truck-turning radii, and the need for two-lane segments in some areas, the analyzed centerline of the proposed truck hauling road does not necessarily overlap with that of the existing Edison Road. Long box trailer, or double trailer, loads would not be feasible for travel on this potential truck haul route. Shorter box trailers, flatbeds, truck-rail container loads, and dump trailers would be more likely candidates. The conceptual engineering of this roadway considered that some portions, where feasible, would have two lanes of travel, and some areas would have single lanes of travel based on the topography.

Implementation Scheudle

Construction	13 months	Apr-20	Apr-21
Operation	17 years	Apr-21	Feb-38
Decommissioning	NA	NA	NA

Construction/Decommissioning Equipment and Workforce

Construction of this truck haul roadway is estimated to require the following construction equipment and employees:

Scraper	4
Excavator	4
Bulldozer/Backhoe	2
Motor Grader	2
Sheepsfoot Compactor	1
Dump Trucks	10
Paving Equipment	1
Water Trucks	4
Workers	36

SSFL Transportation Feasibility Study
Edison Road Overland Conveyor
Assumptions

This option consists of constructing an overland conveyor along Edison Road that would transport soil from the west side of the SSFL site to Truck Site 1. The centerline of the route location may not always show the conveyor on the roadway. The intention is for the conveyor to follow the roadway as much as possible. The conveyor would not take over the road ROW or prohibit access. Edison Road would still be available to SCE for inspection and maintenance of its transmission line. The road would also be used as an access road for conveyor maintenance.

This route was chosen for further detailed analysis because it provides relatively direct access from the SSFL site to a viable transfer site (Truck Site 1). A conveyor route in this corridor can be constructed to roughly follow the existing and disturbed ROW, providing access to the route for construction and maintenance, and the slopes along the corridor provide a more feasible construction scenario, compared to other conveyor routes considered.

Rail Logistics

This route would terminate at Truck Site 1, where the conveyed material would be transferred into haul trucks for direct transport to disposal facilities and would not involve any transport by rail.

Implementation Scheudle

Construction	15 months	Apr-20	Jun-21
Operation	17 years	Jun-21	Feb-38
Decommissioning	13 months	Mar-38	Mar-39

Construction/Decommissioning Equipment and Workforce

Construction of this truck haul roadway is estimated to require the following construction equipment and employees:

Conveyor

Hydraulic Cranes	2
Portable welders	2
Service Trucks	4
Front-end Loader	1
Bulldozers	2
Backhoe	1
Grader	1
Workers	12

SSFL Transportation Feasibility Study
Edison Road Overland Conveyor
Assumptions

Truck Site 1

Front end Loader/Backhoe	3
Graders	2
Scraper	1
Excavators	2
Dump Trucks	20
Sheepfoot compactor	2
Roller compactor	2
curb and gutter cast machine	1
Pickup trucks	20
Auger	1
Truck mounted Crane	1
Workers	30

The centerline of the route does not exactly follow the road ROW, but the conveyor would follow the roadway as much as possible. An initial 165-foot length of conveyor is required for material loading and to fully enclose the pipe at the tail end of the conveyor. Once enclosed, the pipe conveyor route follows along the western side of Facility Road until it reaches the intersection of Black Canyon Road and North American Cutoff Road. The conveyor crosses over Black Canyon Road on an elevated structure and then continues along the northern side of North American Cutoff Road.

The pipe conveyor route leaves the road grade in two more sections where the road curve radius is greater than the design radius of the pipe conveyor. Elevated structures would be used to cross two smaller ravines prior to reaching the upper grade section.

Once the upper elevation section is reached, the pipe conveyor crosses over North American Cutoff Road and primarily continues along the south side of the road. Whenever the conveyor route must leave the road grade, the conveyor is supported on elevated structures.

The final section of the road continues along the south side of North American Cutoff Road until the paved Box Canyon Road is reached. The conveyor crosses over the North American Cutoff Road, a private road, and the Santa Susana Pass Road, all on elevated structures. Once across Santa Susana Pass Road, the conveyor declines rapidly across previously undisturbed land and terminates at Rail Site 2B.

Rail Logistics

Common to nearly all rail operations is the need to avoid interrupting main line operations with the switching of railcars on the main line. This premise drives the track configurations and operational patterns at the site.

The freight service on this line is provided by a separate entity, UPRR, which owns the franchise to provide freight service on this portion of SCRRA's tracks.

Concepts for Rail Transfer Site 2B keep freight switching off the main line by constructing a new lead track parallel to the main line. Based on aerial imagery, there appears to be adequate space for such a track. ROW acquisition may be required. This track would allow trains in the yard area to make "back-and-forth" switching movements required for loading without occupying the main line.

Implementation Scheudle

Construction	15 months	Apr-20	Jun-21
Operation	17 years	Jun-21	Feb-38
Decommissioning	13 months	Mar-38	Mar-39

Construction/Decommissioning Equipment and Workforce

Construction of this truck haul roadway is estimated to require the following construction equipment and employees:

SSFL Transportation Feasibility Study
North American Cutoff Overland Conveyor
Assumptions

Conveyor

Hydraulic Cranes	2
Portable welders	2
Service Trucks	4
Front-end Loader	1
Bulldozers	2
Backhoe	1
Grader	1
Workers	12

Rail Site

Ballast Regulator	1
Bulldozers	2
Paver	1
Compactor	1
Crane	1
Dump trucks	2
excavator	1
Forklift	1
Loaders	2
Grader	1
Railroad Tamper	1
Workers	10

SSFL Transportation Feasibility Study
North American Cutoff Aerial Conveyor
Assumptions

This section discusses a potential aerial conveyor route, from the east side of the SSFL site to Rail Site 2B on the east side of the study area. This route would generally follow the same route as for the North American Cutoff Overland Conveyor. The routes identified along North American Cutoff Road for the surface conveyor and aerial conveyor technologies differ based on the topographical and road radius design limitations specific to each conveyor technology.

Rail Logistics

This conveyor route would link to Rail Site 2B. The conveyor would have a northern terminus at that site, and materials would be transferred to railcars via transfer facilities constructed at that site as described for the Overland Conveyor Alternative.

Implementation Scheudle

Construction	12 months	Apr-20	Mar-21
Operation	17 years	Apr-21	Feb-38
Decommissioning	12 months	Mar-38	Mar-39

Construction/Decommissioning Equipment and Workforce

Construction of this truck haul roadway is estimated to require the following construction equipment and employees:

SSFL Transportation Feasibility Study
North American Cutoff Aerial Conveyor
Assumptions

Conveyor

Hydraulic Cranes	2
bulldozers	2
dump trucks	2
excavators	2
Forklifts	2
Trucks	2
Workers	22

Rail Site

Ballast Regulator	1
Bulldozers	2
Paver	1
Compactor	1
Crane	1
Dump trucks	2
excavator	1
Forklift	1
Loaders	2
Grader	1
Railroad Tamper	1
Workers	10

SSFL Transportation Feasibility Analysis

Construction Emissions

Criteria Pollutant Emissions

Table 1-1: Adjusted Tier 4 Emission Factors (g/bhp-hr)

	VOC	NOx	CO	SOx	PM10	PM2.5	HP	LF	
Percent Reduction	0	0	0	0	0	0			
Rubber Tired Dozers	0.08	1.29	2.6	0.005	0.008	0.008	247	0.4	
Tractors/Loaders/Backhoes	0.11	2.14	3.7	0.005	0.008	0.008	97	0.37	
Graders	0.08	1.29	2.6	0.005	0.008	0.008	187	0.41	
Excavators	0.06	2.15	3.7	0.005	0.008	0.008	158	0.38	
Scrapers	0.08	1.29	2.6	0.005	0.008	0.008	367	0.48	
	0.12	2.74	3.7	0.005	0.112	0.112	64	0.46	
cranes	0.08	1.29	2.6	0.0049	0.008	0.008	236	0.29	
Forklifts	0.11	2.14	3.7	0.005	0.008	0.008	89	0.20	
auger	0.08	1.29	2.6	0.005	0.008	0.008	221	0.5	Bore/Drill Rig
Blast Regulator	0	0	0	0	0	0			(Not diesel/gas, no emissions)
Curb Gutter Cast	0.06	2.15	3.7	0.005	0.008	0.008	130	0.42	(modeled using Paver)
Railroad Tamper	0.06	2.15	3.7	0.005	0.008	0.008	172	0.42	(Other Construction Equipment)
Paver	0.06	2.15	3.7	0.005	0.008	0.008	130	0.42	
Paving Equipment	0.06	2.15	3.7	0.005	0.008	0.008	132	0.36	
Plate Compactor	0.12	4.55	4.1	0.005	0.128	0.128	8	0.43	
Roller compactor	0.11	2.14	3.7	0.005	0.008	0.008	80	0.38	
welders	0.12	4.55	4.1	0.005	0.128	0.128	46	0.45	

Table 1-2: Emission Factors (g/mile)

	VOC	NOx	CO	SOx	PM10	PM2.5
Water Truck	0.228949	5.49369	8.521567	0.016	0.00607	0.005811
Dump Truck	0.228949	5.49369	8.521567	0.016	0.00607	0.005811
Service Trucks	0.055925	0.11149	1.355542	0.00303	0.00488	0.004491
Onsite Worker Transport	0.055925	0.11149	1.355542	0.00303	0.00488	0.004491

SSFL Transportation Feasibility Analysis
Construction Emissions
Criteria Pollutant Emissions

Onsite Exhaust Emission Factors

Assumptions:

- Equipment type and number (Table 1-4) taken from the PD.
- Quantity of each equipment type was provided by DTSC based on current onsite operations.
- Emission factors for onsite construction equipment taken from Table 3.4 of Appendix D of the CalEEMod user guide (BREEZE software, a Division of Trinity Consultants, 2016). 2016 emission factors were used as a conservative estimate for all years as equipment is not anticipated to be changed out unless it breaks. Therefore even though construction could last for 18 years, there is the potential that the same equipment in use at the beginning of the project would be in use at the end of the project.
- Emissions for water truck and Haul trucks taken from EMFAC 2014 for Ventura County for Heavy Heavy Duty Trucks at 15 mph. Haul Trucks adjusted to a 2014 vehicle fleet only
- Emission factors for onsite worker transport trips are from EMFAC2014 for Ventura County for LDA vehicles traveling 15 mph.
- Horsepower and load factors taken as the average for each equipment type from Table 3.3 of Appendix D of the CalEEMod User's Guide (BREEZE software, a Division of Trinity Consultants, 2016).
- Tier 4 Interim Emissions are taken from Table 3.5 of Appendix D of the CalEEMod User Guide (BREEZE software, a Division of Trinity Consultants, 2016). Tier 3 is an EPA standard for emissions of offroad vehicle engines.

SSFL Transportation Feasibility Analysis

Construction Emissions

Criteria Pollutant Emissions

Table 1-3: Criteria Pollutant Emission Factors Per 8 hour work day per vehicle

	VOC	NOx	CO	SOx	PM10	PM2.5
	(lbs/day) per equipment type					
Rubber Tired Dozers	0.1394	2.24783	4.530511	0.00871	0.01394	0.01394
Tractors/Loaders/Backhoes	0.069628	1.35458	2.342028	0.00316	0.00506	0.005064
Graders	0.108176	1.74434	3.515732	0.00676	0.01082	0.010818
Excavators	0.063534	2.27665	3.917954	0.00529	0.00847	0.008471
Scrapers	0.24855	4.00787	8.077884	0.01553	0.02486	0.024855
cranes	0.096564	1.5571	3.138342	0.00591	0.00966	0.009656
Forklifts	0.034533	0.67182	1.161552	0.00157	0.00251	0.002511
auger	0.155908	2.51402	5.067019	0.00974	0.01559	0.015591
Blast Regulator	0	0	0	0	0	0
Curb Gutter Cast	0.057778	2.07037	3.562963	0.00481	0.0077	0.007704
Railroad Tamper	0.076444	2.73926	4.714074	0.00637	0.01019	0.010193
Paver	0.057778	2.07037	3.562963	0.00481	0.0077	0.007704
Paving Equipment	0.050286	1.8019	3.100952	0.00419	0.0067	0.006705
Plate Compactor	0.00728	0.27605	0.248748	0.0003	0.00777	0.007766
Roller compactor	0.058977	1.14737	1.983774	0.00268	0.00429	0.004289
welders	0.04381	1.66111	1.496825	0.00183	0.04673	0.04673
Water Truck	0.045426	1.09002	1.690787	0.00317	0.00121	0.001153
Service Truck	0.011096	0.02212	0.268957	0.0006	0.00097	0.000891
Dump Truck (VCAPCD)	0.005714	0.1371	0.212663	0.0004	0.00015	0.000145
Dump Truck (SCAQMD)	0.009883	0.23714	0.36784	0.00069	0.00026	0.000251
Dump Truck (Offsite)	0.010095	0.24223	0.37573	0.00071	0.00027	0.000256
Worker Commute (VCAPCD)	0.003861	0.0077	0.093597	0.00021	0.00034	0.00031
Worker Commute (SCAQMD)	0.00488	0.00973	0.118281	0.00026	0.00043	0.000392
Worker Commute (Total)	0.004932	0.00983	0.119536	0.00027	0.00043	0.000396

8 Hour work day

Emissions per day determined by multiplying the emission factor, load factor, and horsepower (Table 1-1) by the number of ours per day (8) then dividing grams by 453.6 to convert to pounds.

SSFL Transportation Feasibility Analysis
Construction Emissions
Criteria Pollutant Emissions

Equations

- Daily emssions = (Emission Factor X Horse power X Load Factor X Quantity X Hours per day) / 453.6
    - 453.6 grams per pound
    - Emission Factor, Horse Power, and Load Factor from Appendix Table Table 1-1.
    - 8 Hour work day
- Daily emissions (Water truck) = (Emission Factor X Miles) / 453.6
    - Assumes water trucks at 90 miles per day for onsite operations (15 mph for 6 hrs per day)
    - Assumes dump trucks have 20 mile offsite round trip daily (11.32 max in VCAPCD; 19.58 max in SCAQMD)
    - Assumes total of 40 miles round trip per day for workers (max 31.32 in VCAPCD or Max 39.58 in SCAQMD)

*Totals may not add exactly due to rounding.

Table 1-4: Construction Equipment List

	Woosley Canyon	Edison Road	Overland Conveyor	Truck Site	Rail Site	Aerial Conveyor	
Rubber Tired Dozers	0	0	2	0	2	2	
Tractors/Loaders/Backhoes	0	2	2	3	2	0	
Graders	0	2	1	2	1	0	
Excavators	0	4	0	2	1	2	
Scrapers	0	4	0	1	0	0	
cranes	0	0	2	1	1	2	
Forklifts	0	0	0	0	1	2	
auger	0	0	0	1	0	0	
Blast Regulator	0	0	0	0	1	0	Not diesel
Curb Gutter Cast	0	0	0	1	0	0	(Paver)
Railroad Tamper	0	0	0	0	1	0	Other equipment
Paver	0	0	0	0	1	0	
Paving Equipment	0	1	0	0	0	0	
Compactor	0	1	0	2	1	0	
Roller compactor	0	0	0	2	0	0	
welders	0	0	2	0	0	0	
Water Truck	0	4	0	0	0	0	
service trucks	0	0	4	20	0	2	(worker trucks - gas vehicles)
Dump Truck (offsite)	0	10	0	20	2	2	(Haul trucks)
Workers	0	36	12	30	10	22	
Months	0	13	11.25	3.75	3.75	8.25	

SSFL Transportation Feasibility Analysis

Construction Emissions

Fugitive Dust Emissions

Onsite Fugitive Dust Emission Factors

Fugitive emissions from scrapers/graders:

PM10 = (0.051 x (S)2.0) X FPM10
= (0.051 x (7.1)2.0) X 0.6
= 1.542546 lbs/VMT

S = mean vehicle speed (mph) Default = 7.1
FPM10 = PM10 scaling factor default of 0.6
FPM2.5 = PM2.5 scaling factor default of 0.031

PM2.5 = (0.04 x (S)2.5) x FPM2.5
= (0.04 x (7.1)2.5) x 0.031
= 0.16655879 lbs/VMT

Fugitive emissions from Dozers and Excavators:

PM10 = ((CPM15 x s1.5)/M1.4) x FPM10
= ((1 x 6.91.5)/7.91.4) x 0.75
= 0.752760759 lbs/hr

CPM15 = arbitary coefficient used by AP-42 = 1
s = material silt content = 6.9 %
M = material moisture content = 7.9%
FPM10 = PM10 scaling factor default of 0.75

PM2.5 = ((CTSP x s1.2)/M1.3) x FPM2.5
= ((5.7 x 6.91.2)/7.91.3) x 105
= 0.413778428 lbs/hr

CTSP = arbitary coefficient used by AP-42 = 5.7
FPM2.5= PM2.5 scaling factor default of 0.105

Fugitive emissions from truck loading

PM10 = k x (0.0032) x ((U/5)1.3/(M/2)1.4)
= 0.35 x (0.0032) x ((5.82/5)1.3/(12/2)1.4)
= 0.000110958 lbs/ton

k = particle size (PM10 = 0.35, PM2.5 = 0.053)
U= wind speed (miles - hour) = 5.816034
M = Material moisture content = 12%

PM2.5 = k x (0.0032) x ((U/5)1.3/(M/2)1.4)
= 0.053 x (0.0032) x ((5.82/5)1.3/(12/2)1.4)
= 1.68023E-05 lbs/ton

SSFL Transportation Feasibility Analysis
Construction Emissions
Fugitive Dust Emissions

Onsite Fugitive Emissions

Assumptions

- Emissons for graders and scrapers = Emission factor x(((Acres / blade width of 12 ft) x 43,560 sqft per acre) / 5,280 ft per mile)
- Acres are based on table provided on page 9 of CalEEMod Appendix A.
  scrapers 1 acers/8hr day
- Emissions include a 63% reduction for required fugitive dust control measures.

- Emissions for dozers/excavators = # equipment X hours of operation X emission factor
- Emissions for Excavation truck loading = EF x Tons
- Emissions for Mechanical demolition and debris loading = Emission Factor (lbs/ton) X tons of debris
- Assumes 23 tons per truck

Table 1-5: Onsite Equipment producing fugitive emissions

	Woosley Canyon	Edison Road	Overland Conveyor	Truck Site	Rail Site	Aerial Conveyor
scrapers	0	4	0	1	0	0
graders	0	2	1	2	1	0
dozers	0	0	2	0	2	2
excavators	0	4	0	2	1	2
Dump Trucks	0	10	0	20	2	2

Equipment numbers taken from Table 1-4.

SSFL Transportation Feasibility Analysis
Construction Emissions
GHG Emissions

Table 1-6: Construction Exhaust GHG Emission Factors (g/bhp-hr)

Emission Factors (g/bhp-hr)

	CO_2	CH_4	HP	LF	CalEEMod Category
Rubber Tired Dozers	509.46	0.15	247	0.40	
Tractors/Loaders/Backhoes	511.3456	0.154	97	0.37	
Graders	511.6959	0.154	187	0.41	
Excavators	506.495	0.153	158	0.38	
Scrapers	502.255	0.151	367	0.48	
cranes	507.1552	0.153	236	0.29	
Forklifts	505.5833	0.153	89	0.2	
auger	502.128	0.151	221	0.5	Bore/Drill Rig
Blast Regulator	0	0			(Not diesel/gas, no emissions)
Curb Gutter Cast	506.5401	0.153	130	0.42	(modeled using Paver)
Railroad Tamper	509.3069	0.152	172	0.42	(Other Construction Equipment)
Paver	506.5401	0.153	130	0.42	
Paving Equipment	504.8201	0.152	132	0.36	
Plate Compactor	568.299	0.059	8	0.43	
Roller compactor	508.1987	0.153	80	0.38	
welders	568.299	0.138	46	0.45	

Table 1-7: GHG Emission Factors (gr/mile)

	CO_2	CH_4/N_2O
Water Truck	2,582	129
Dump Truck	2,582	129
Service Trucks	556	28
Onsite Worker Transport	556	28

SSFL Transportation Feasibility Analysis
Construction Emissions
GHG Emissions

Table 1-8: GHG Emission Factors Per 8 hour work day per vehicle

	CO_2	CH_4
	MT/Day	
Rubber Tired Dozers	0.4027	0.0001
Tractors/Loaders/Backhoes	0.1468	0.0000
Graders	0.3139	0.0001
Excavators	0.2433	0.0001
Scrapers	0.7078	0.0001
cranes	0.2777	0.0000
Forklifts	0.0720	0.0001
auger	0.4439	0.0000
Blast Regulator	0.0000	0.0001
Curb Gutter Cast	0.2213	0.0001
Railroad Tamper	0.2943	0.0001
Paver	0.2213	0.0001
Paving Equipment	0.1919	0.0000
Plate Compactor	0.0156	0.0000
Roller compactor	0.1236	0.0000
welders	0.0941	0.0000
Water Truck	0.2324	0.0116
Service Truck	0.0500	0.0025
Dump Truck (VCAPCD)	0.0292	0.0015
Dump Truck (SCAQMD)	0.0506	0.0025
Dump Truck (Offsite)	0.0516	0.0026
Worker Commute (VCAPCD)	0.0174	0.0009
Worker Commute (SCAQMD)	0.0220	0.0011
Worker Commute (Total)	0.0222	0.0011

8 hour work day

0.000001 g/MT

Table 1-9: Construction Schedule

	Woosley Canyon	Edison Road	Overland Conveyor	Truck Site	Rail Site	Aerial Conveyor
Months	0	12	11.25	3.75	3.75	8.25
Days/Month	~22	~22	~22	~22	~22	~22
Days/year	0	260	243.75	81.25	81.25	178.75

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Train Emission Factors & Emissions Per Mile

UPRR Engine Emissions

	2014 Fleet Percentage[1]
Uncontrolled	0.29%
Tier 0	29.45%
Tier 1	14.43%
Tier 2	36.74%
Tier 3	15.07%
Tier 4	0.04%

[1] *CARB 2015. 2014 UP Locomotive Summary. Available : http://www.arb.ca.gov/railyard/1998agree/1998agree.htm; Accessed May 2016*

Table 1-9: Train Emission Factors by Tier

	PM10[2] (g/bhp-hr)		HC[2] (g/bhp-hr)		CO[2] (g/bhp-hr)	SO_2[2]	NOx[3] (g/bhp-hr)	CO_2[2]
	Raw	Fleet	Raw	Fleet	Raw			
Uncontrolled	0.32	0.0939743	0.48	0.14096	1.28	-	-	-
Tier 0	0.32	9.42251523	0.48	14.1338	1.28	-	-	-
Tier 1	0.32	4.61628749	0.47	6.78017	1.28	-	-	-
Tier 2	0.18	6.61366784	0.26	9.55308	1.28	-	-	-
Tier 3	0.08	1.20555843	0.13	1.95903	1.28	-	-	-
Tier 4	0.15	0.00549375	0.04	0.00147	1.28	-	-	-
Fleet Average		0.21957497		0.32568	1.28		5.5	
Gr/gallon[4]		4.56715939		6.77424	26.624	1.88	114.4	10,217
ROG Emissions[5]				7.13328				
PM2.5 Emissions[6]		4.4301446						

456 miles per gallon[7]
0.002205 lbs per gram
0.000001 MT per gram

Table 1-10: Composit Train Emission Factors

	ROG	NOx	CO	SO_2	PM10	PM2.5	CO_2	CH_4
lbs/gallon	0.01572888	0.252252	0.058706	0.00415	0.010071	0.00976847	-	-
MT/gallon	-	-	-	-	-	-	0.010217	0.0005109

Criteria Pollutants

7,350	Tons per train
456	miles per gallon
576	miles per day
1.26	gallons/ton
9,284.21	gallons/trip

GHG

7,350	Tons per train
456	miles per gallon
1,550	miles per train
3.40	gallons/ton
24,983.55	gallons/trip

Table 1-11: Train Emissions: Per Train and Per mile

	ROG	NOx	CO	SO_2	PM10	PM2.5	CO_2	CH_4
lbs/day	146.03	2341.96	545.04	38.49	93.50	90.69	-	-
lbs/mile	0.25	4.07	0.95	0.07	0.16	0.16	-	-
MT/train	-	-	-	-	-	-	255.25696	12.762848
MT/mile	-	-	-	-	-	-	0.1646819	0.0082341

[2] *USEPA 2009. Emission Factors for Locomotives EPA-420-F-09-025. April. Available: www3.epa.gov/nonroad/locomotv/420f09025.pdf. Accessed May 2016*

[3] *CARB 2015. 1998 Locomotive Nox Fleet Average Emissions Agreement in South Coast Air Basin. Updated November 17, 2015. Available : http://www.arb.ca.gov/railyard/1998agree/1998agree.htm; Accessed May 2016*

[4] *grams/gallon is equal to g/bhp-hr times 20.8*[2]

[5] *VOC emissions are assumed to be equal to 1.053 times the HC emissions2*

[6] *PM2.5 emissions are estimated as 0.97 times the PM10 emissions2*

[5] On average UPRR trains can move one ton of freight 456 miles on a single gallon of gas: Available: http://www.up.com/aboutup/environment/operations/index.htm. Accessed: May 2016

Transportation Feasibility Study
Air Quality and GHG
Construction Emissions Calculations

SSFL Transportation Feasibility Analysis
Emissions Summary
Construction

Data for thesesummary tables were pulled from Tables: 2-6 to 2-14

Tabe 2-1: Woolsey Canyon Road Truck Route - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Onsite Construction	0	0	0	0	0	0	0
Fugitive Emissions	-	-	-	-			-
Offsite (VCAPCD	0	0	0	0	0	0	0
Offsite (SCAQMD)	0	0	0	0	0	0	0
Offsite (Total)	0	0	0	0	0	0	0
Construction Total	0	0	0	0	0	0	0
Total (VCAPCD)	0	0	0	0	0	0	0
Total (SCAQMD)	0	0	0	0	0	0	0
	Tons/year						
Total	0	0	0	0	0	0	
Total (VCAPCD)	0	0	0	0	0	0	
Total (SCAQMD)	0	0	0	0	0	0	

Table 2-2: Edison Road Truck Route - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Onsite Construction	2	38	70	0	0	0	1,537
Fugitive Emissions	-	-	-	-	14	6	-
Offsite (VCAPCD	0	2	5	0	0	0	251
Offsite (SCAQMD)	0	3	8	0	0	0	354
Offsite (Total)	0	3	8	0	0	0	360
Construction Total	2	41	78	0	14	7	1,896
Total (VCAPCD)	2	39	75	0	14	7	1,788
Total (SCAQMD)	2	40	78	0	14	7	1,891
	Tons/year						
Total	<1	5	10	<1	2	1	
Total (VCAPCD)	<1	5	10	<1	2	1	
Total (SCAQMD)	<1	5	10	<1	2	1	
Total Woolsey Cayon Operational Plus Edison Road Construction							
	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Total	5	91	97	2	14	7	13,025
Total (VCAPCD)	2	41	76	0	14	7	2,003
Total (SCAQMD)	4	64	87	1	14	7	7,040
	Tons/year						
Total (VCAPCD)	1	12	13	<1	2	1	

SSFL Transportation Feasibility Analysis
Emissions Summary
Construction

Data for thesesummary tables were pulled from Tables: 2-6 to 2-14

Table 2-3: Edison Road Overland Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
	Overland Conveyor						
Onsite Construction	1	15	28	0	0	0	577
Fugitive Emissions	-	-	-	-	6	3	-
Offsite (VCAPCD	0	0	1	0	0	0	53
Offsite (SCAQMD)	0	0	1	0	0	0	68
Offsite (Total)	0	0	1	0	0	0	68
Conveyor Total	1	16	29	0	0	0	645
Conveyor (VCAPCD)	1	16	29	0	6	3	630
Conveyro (SCAQMD)	1	16	29	0	6	3	645
	Truck Site						
Onsite Construction	1	26	52	0	0	0	369
Fugitive Emissions	-	-	-	-	7	3	-
Offsite (VCAPCD	0	3	7	0	0	0	94
Offsite (SCAQMD)	0	5	11	0	0	0	143
Offsite (Total)	0	5	11	0	0	0	145
Truck Site Total	2	31	63	0	0	0	514
Truck site (VCAPCD)	2	29	59	0	7	3	463
Trucksite (SCAQMD)	2	31	62	0	7	3	511
	Construction Total						
Total	3	46	92	0	13	7	1,159
Total (VCAPCD)	3	44	87	0	13	7	1,093
Total (SCAQMD)	3	46	92	0	13	7	1,156
	Tons/year						
Total	<1	6	12	<1	2	1	
Total (VCAPCD)	<1	6	11	<1	2	1	
Total (SCAQMD)	<1	6	12	<1	2	1	

Total Woolsey Cayon Operational Plus Edison Road Overland Conveyor Construction

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Total	6	97	111	2	14	7	12,287
Total (VCAPCD)	3	46	88	0	13	7	1,309
Total (SCAQMD)	4	70	100	1	13	7	6,305
	Tons/year						
Total (VCAPCD)	1	13	14	<1	2	1	

SSFL Transportation Feasibility Analysis
Emissions Summary
Construction

Data for thesesummary tables were pulled from Tables: 2-6 to 2-14

Table 2-4: North American Cutoff Overland Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
	Overland Conveyor						
Onsite Construction	1	15	28	0	0	0	577
Fugitive Emissions	-	-	-	-	6	3	-
Offsite (VCAPCD	0	0	1	0	0	0	53
Offsite (SCAQMD)	0	0	1	0	0	0	68
Offsite (Total)	0	0	1	0	0	0	68
Conveyor Total	1	16	29	0	0	0	645
Conveyor (VCAPCD)	1	16	29	0	6	3	630
Conveyro (SCAQMD)	1	16	29	0	6	3	645
	Rail Site						
Onsite Construction	1	19	34	0	0	0	412
Fugitive Emissions	-	-	-	-	9	5	-
Offsite (VCAPCD	0	0	1	0	0	0	38
Offsite (SCAQMD)	0	1	2	0	0	0	52
Offsite (Total)	0	1	2	0	0	0	53
Truck Site Total	1	19	36	0	0	0	465
Truck site (VCAPCD)	1	19	35	0	9	5	450
Trucksite (SCAQMD)	1	19	36	0	9	5	464
	Construction Total						
Total	2	35	65	0	15	8	1,110
Total (VCAPCD)	2	34	64	0	15	8	1,081
Total (SCAQMD)	2	35	65	0	15	8	1,109
	Tons/year						
Total	<1	5	8	<1	2	1	
Total (VCAPCD)	<1	4	8	<1	2	1	
Total (SCAQMD)	<1	5	8	<1	2	1	

Total Woolsey Cayon Operational Plus North American Cutoff Overland Conveyor Construction

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Total	5	85	84	2	15	8	12,239
Total (VCAPCD)	2	36	65	0	15	8	1,296
Total (SCAQMD)	3	58	74	1	15	8	6,258
	Tons/year						
Total (VCAPCD)	1	11	11	<1	2	1	

SSFL Transportation Feasibility Analysis
Emissions Summary
Construction

Data for thesesummary tables were pulled from Tables: 2-6 to 2-14

Table 2-5: North American Cutoff Aerial Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
	Aerial Conveyor						
Onsite Construction	1	1	6	0	0	0	375
Fugitive Emissions	-	-	-	-	11	6	-
Offsite (VCAPCD	0	0	2	0	0	0	83
Offsite (SCAQMD)	0	1	3	0	0	0	110
Offsite (Total)	0	1	3	0	0	0	111
Conveyor Total	1	2	9	0	0	0	486
Conveyor (VCAPCD)	1	2	8	0	11	6	458
Conveyro (SCAQMD)	1	2	9	0	11	6	485
	Rail Site						
Onsite Construction	1	19	34	0	0	0	412
Fugitive Emissions	-	-	-	-	9	5	-
Offsite (VCAPCD	0	0	1	0	0	0	38
Offsite (SCAQMD)	0	1	2	0	0	0	52
Offsite (Total)	0	1	2	0	0	0	53
Truck Site Total	1	19	36	0	0	0	465
Truck site (VCAPCD)	1	19	35	0	9	5	450
Trucksite (SCAQMD)	1	19	36	0	9	5	464
	Construction Total						
Total	2	21	45	0	20	11	951
Total (VCAPCD)	2	21	43	0	20	11	908
Total (SCAQMD)	2	21	45	0	20	11	949
	Tons/year						
Total	<1	3	6	<1	3	1	
Total (VCAPCD)	<1	3	6	<1	3	1	
Total (SCAQMD)	<1	3	6	<1	3	1	

Total Woolsey Cayon Operational Plus North American Cutoff Aerial Conveyor Construction

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Total	5	71	64	2	20	11	12,080
Total (VCAPCD)	2	22	44	0	20	11	1,123
Total (SCAQMD)	3	45	54	1	20	11	6,098
	Tons/year						
Total (VCAPCD)	1	9	8	<1	3	1	

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Table 2-6: Edison Road Construction Emissions

		(lbs/day)					
	#	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	2	0.139256	2.70916	4.68406	0.00633	0.0101	0.01
Graders	2	0.216353	3.48869	7.03146	0.013522	0.0216	0.022
Excavators	4	0.254138	9.1066	15.6718	0.021178	0.0339	0.034
Scrapers	4	0.994201	16.0315	32.3115	0.062138	0.0994	0.099
cranes	0	0	0	0	0	0	0
Forklifts	0	0	0	0	0	0	0
auger	0	0	0	0	0	0	0
Blast Regulator	0	0	0	0	0	0	0
Curb Gutter Cast	0	0	0	0	0	0	0
Railroad Tamper	0	0	0	0	0	0	0
Paver	0	0	0	0	0	0	0
Paving Equipment	1	0.050286	1.8019	3.10095	0.00419	0.0067	0.007
Compactor	1	0.00728	0.27605	0.24875	0.000303	0.0078	0.008
Roller compactor	0	0	0	0	0	0	0
welders	0	0	0	0	0	0	0
Water Truck	4	0.181705	4.36007	6.76315	0.012698	0.0048	0.005
Service Truck	0	0	0	0	0	0	0
Onsite Daily		1.843218	37.774	69.8117	0.12036	0.1844	0.184
Dump Truck (VCAPCD)	10	0.057136	1.371	2.12663	0.003993	0.0015	0.001
Dump Truck (SCAQMD)	10	0.098827	2.37139	3.6784	0.006907	0.0026	0.003
Dump Truck (Total)	10	0.100947	2.42226	3.7573	0.007055	0.0027	0.003
Worker (VCAPCD)	36	0.139014	0.27713	3.36949	0.00753	0.0121	0.011
Worker (SCAQMD	36	0.175676	0.35022	4.25812	0.009516	0.0153	0.014
Worker (Total)	36	0.17754	0.35394	4.30331	0.009617	0.0155	0.014
Offsite (VCAPCD)		0.19615	1.64813	5.49613	0.011523	0.0136	0.013
Offsite (SCAQMD		0.274503	2.72161	7.93653	0.016423	0.018	0.017

Offsite (Total)		0.278487	2.7762	8.06061	0.016672	0.0182	0.017
Total Daily		2.121706	40.5502	77.8723	0.137031	0.2025	0.201

Emissions determined by multiplying the numbe of each equipment type by the emissions per day for each piece of equipment (Table 1-3).

Table 2-7: Overland Conveyor Route

(lbs/day)

	#	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	2	0.278801	4.49566	9.06102	0.017425	0.0279	0.028
Tractors/Loaders/Backhoes	2	0.139256	2.70916	4.68406	0.00633	0.0101	0.01
Graders	1	0.108176	1.74434	3.51573	0.006761	0.0108	0.011
Excavators	0	0	0	0	0	0	0
Scrapers	0	0	0	0	0	0	0
cranes	2	0.193129	3.1142	6.27668	0.011829	0.0193	0.019
Forklifts	0	0	0	0	0	0	0
auger	0	0	0	0	0	0	0
Blast Regulator	0	0	0	0	0	0	0
Curb Gutter Cast	0	0	0	0	0	0	0
Railroad Tamper	0	0	0	0	0	0	0
Paver	0	0	0	0	0	0	0
Paving Equipment	0	0	0	0	0	0	0
Compactor	0	0	0	0	0	0	0
Roller compactor	0	0	0	0	0	0	0
welders	2	0.087619	3.32222	2.99365	0.003651	0.0935	0.093
Water Truck	0	0	0	0	0	0	0
Service Truck	4	0.044385	0.08848	1.07583	0.002404	0.0039	0.004
Onsite Daily		0.851366	15.4741	27.607	0.0484	0.1655	0.165
Dump Truck (VCAPCD)	0	0	0	0	0	0	0
Dump Truck (SCAQMD)	0	0	0	0	0	0	0
Dump Truck (Total)	0	0	0	0	0	0	0
Worker (VCAPCD)	12	0.046338	0.09238	1.12316	0.00251	0.004	0.004
Worker (SCAQMD	12	0.058559	0.11674	1.41937	0.003172	0.0051	0.005
Worker (Total)	12	0.05918	0.11798	1.43444	0.003206	0.0052	0.005
Offsite (VCAPCD)		0.046338	0.09238	1.12316	0.00251	0.004	0.004
Offsite (SCAQMD		0.058559	0.11674	1.41937	0.003172	0.0051	0.005

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Offsite (Total)		0.05918	0.11798	1.43444	0.003206	0.0052	0.005
Total Daily		0.910545	15.592	29.0414	0.051606	0.1706	0.17

Emissions determined by multiplying the numbe of each equipment type by the emissions per day for each piece of equipment (Table 1-3).

Table 2-8: Truck Site Development

		(lbs/day)					
	#	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	0	0	0	0	0	0	0
Tractors/Loaders/Backhoes	3	0.208884	4.06374	7.02608	0.009495	0.0152	0.015
Graders	2	0.216353	3.48869	7.03146	0.013522	0.0216	0.022
Excavators	2	0.127069	4.5533	7.83591	0.010589	0.0169	0.017
Scrapers	1	0.24855	4.00787	8.07788	0.015534	0.0249	0.025
cranes	1	0.096564	1.5571	3.13834	0.005915	0.0097	0.01
Forklifts	0	0	0	0	0	0	0
auger	1	0.155908	2.51402	5.06702	0.009744	0.0156	0.016
Blast Regulator	0	0	0	0	0	0	0
Curb Gutter Cast	1	0.057778	2.07037	3.56296	0.004815	0.0077	0.008
Railroad Tamper	0	0	0	0	0	0	0
Paver	0	0	0	0	0	0	0
Paving Equipment	0	0	0	0	0	0	0
Compactor	2	0.014561	0.5521	0.4975	0.000607	0.0155	0.016
Roller compactor	2	0.117954	2.29474	3.96755	0.005362	0.0086	0.009
welders	0	0	0	0	0	0	0
Water Truck	0	0	0	0	0	0	0
Service Truck	20	0.221925	0.44242	5.37914	0.012021	0.0194	0.018
Onsite Daily		1.465546	25.5443	51.5838	0.087603	0.1551	0.154
Dump Truck (VCAPCD)	20	0.114272	2.742	4.25327	0.007986	0.003	0.003
Dump Truck (SCAQMD)	20	0.197655	4.74279	7.3568	0.013813	0.0052	0.005
Dump Truck (Total)	20	0.201895	4.84452	7.51461	0.014109	0.0054	0.005
Worker (VCAPCD)	30	0.115845	0.23094	2.80791	0.006275	0.0101	0.009
Worker (SCAQMD	30	0.146396	0.29185	3.54844	0.00793	0.0128	0.012
Worker (Total)	30	0.14795	0.29495	3.58609	0.008014	0.0129	0.012
Offsite (VCAPCD)		0.230117	2.97294	7.06118	0.014261	0.0131	0.012
Offsite (SCAQMD		0.344051	5.03464	10.9052	0.021743	0.018	0.017

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Offsite (Total)		0.349845	5.13947	11.1007	0.022124	0.0183	0.017
Total Daily		1.81539	30.6838	62.6845	0.109727	0.1733	0.171

Emissions determined by multiplying the numbe of each equipment type by the emissions per day for each piece of equipment (Table 1-3).

Table 2-9: Rail Site Development

		(lbs/day)					
	#	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	2	0.278801	4.49566	9.06102	0.017425	0.0279	0.028
Tractors/Loaders/Backhoes	2	0.139256	2.70916	4.68406	0.00633	0.0101	0.01
Graders	1	0.108176	1.74434	3.51573	0.006761	0.0108	0.011
Excavators	1	0.063534	2.27665	3.91795	0.005295	0.0085	0.008
Scrapers	0	0	0	0	0	0	0
cranes	1	0.096564	1.5571	3.13834	0.005915	0.0097	0.01
Forklifts	1	0.034533	0.67182	1.16155	0.00157	0.0025	0.003
auger	0	0	0	0	0	0	0
Blast Regulator	1	0	0	0	0	0	0
Curb Gutter Cast	0	0	0	0	0	0	0
Railroad Tamper	1	0.076444	2.73926	4.71407	0.00637	0.0102	0.01
Paver	1	0.057778	2.07037	3.56296	0.004815	0.0077	0.008
Paving Equipment	0	0	0	0	0	0	0
Compactor	1	0.00728	0.27605	0.24875	0.000303	0.0078	0.008
Roller compactor	0	0	0	0	0	0	0
welders	0	0	0	0	0	0	0
Water Truck	0	0	0	0	0	0	0
Service Truck	0	0	0	0	0	0	0
Onsite Daily		0.862367	18.5404	34.0044	0.054783	0.0951	0.095
Dump Truck (VCAPCD)	2	0.011427	0.2742	0.42533	0.000799	0.0003	3E-04
Dump Truck (SCAQMD)	2	0.019765	0.47428	0.73568	0.001381	0.0005	5E-04
Dump Truck (Total)	2	0.020189	0.48445	0.75146	0.001411	0.0005	5E-04
Worker (VCAPCD)	10	0.038615	0.07698	0.93597	0.002092	0.0034	0.003
Worker (SCAQMD	10	0.048799	0.09728	1.18281	0.002643	0.0043	0.004
Worker (Total)	10	0.049317	0.09832	1.19536	0.002671	0.0043	0.004
Offsite (VCAPCD)		0.050042	0.35118	1.3613	0.00289	0.0037	0.003

Offsite (SCAQMD		0.068564	0.57156	1.91849	0.004025	0.0048	0.004
Offsite (Total)		0.069506	0.58277	1.94682	0.004082	0.0048	0.004
Total Daily		0.931873	19.1232	35.9513	0.058866	0.1	0.1

Emissions determined by multiplying the numbe of each equipment type by the emissions per day for each piece of equipment (Table 1-3).

Table 2-10: Aerial Converyor Construction

(lbs/day)

	#	VOC	NOx	CO	SO_x	PM_{10}	$PM_{2.5}$
Rubber Tired Dozers	2	0.278801	0.6267	2.83926	0.024737	0.0003	5E-06
Tractors/Loaders/Backhoes	0	0	0	0	0	0	0
Graders	0	0	0	0	0	0	0
Excavators	2	0.127069	0.28929	1.13343	0.006001	5E-05	4E-07
Scrapers	0	0	0	0	0	0	0
cranes	2	0.193129	0.30072	0.94376	0.005582	5E-05	5E-07
Forklifts	2	0.069065	0.0464	0.0539	8.46E-05	2E-07	5E-10
auger	0	0	0	0	0	0	0
Blast Regulator	0	0	0	0	0	0	0
Curb Gutter Cast	0	0	0	0	0	0	0
Railroad Tamper	0	0	0	0	0	0	0
Paver	0	0	0	0	0	0	0
Paving Equipment	0	0	0	0	0	0	0
Compactor	0	0	0	0	0	0	0
Roller compactor	0	0	0	0	0	0	0
welders	0	0	0	0	0	0	0
Water Truck	0	0	0	0	0	0	0
Service Truck	2	0.022192	0.04424	0.53791	0.001202	0.0019	0.002
Onsite Daily		0.690256	1.30735	5.50826	0.037607	0.0024	0.002
Dump Truck (VCAPCD)	2	0.011427	0.2742	0.42533	0.000799	0.0003	3E-04
Dump Truck (SCAQMD)	2	0.019765	0.47428	0.73568	0.001381	0.0005	5E-04
Dump Truck (Total)	2	0.020189	0.48445	0.75146	0.001411	0.0005	5E-04
Worker (VCAPCD)	22	0.084953	0.16936	2.05913	0.004602	0.0074	0.007
Worker (SCAQMD	22	0.107357	0.21402	2.60219	0.005815	0.0094	0.009
Worker (Total)	22	0.108497	0.21629	2.6298	0.005877	0.0095	0.009
Offsite (VCAPCD)		0.09638	0.44356	2.48446	0.0054	0.0077	0.007
Offsite (SCAQMD		0.127123	0.6883	3.33787	0.007197	0.0099	0.009
Offsite (Total)		0.128686	0.70075	3.38126	0.007288	0.01	0.009
Total Daily		0.818942	2.0081	8.88952	0.044895	0.0124	0.011

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Construction Emissions
Fugitive Dust Emissions

Table 2-11: Onsite Fugitive Emissions

	Acres	#	Tons/truck	# Trucks	PM_{10}	$PM_{2.5}$
Maximum (lbs/day) - Edison Road Construction						
Scrapers/graders	6	N/A	N/A	N/A	2.36	0.25
Dozers/Excavators	N/A	4.00	N/A	N/A	11.16	6.13
Truck Loading	N/A	N/A	N/A	N/A	0.03	0.01
Total					***13.54***	***6.39***
Maximum (lbs/day) - Overland Conveyor Construction						
Scrapers/graders	1	N/A	N/A	N/A	0.39	0.04
Dozers/Excavators	N/A	2.00	N/A	N/A	5.58	3.07
Truck Loading	N/A	N/A	N/A	N/A	0.00	0.00
Total					***5.97***	***3.11***
Maximum (lbs/day) - Truck Site Construction						
Scrapers/graders	3	N/A	N/A	N/A	1.18	0.13
Dozers/Excavators	N/A	2.00	N/A	N/A	5.58	3.07
Truck Loading	N/A	N/A	N/A	N/A	0.05	0.02
Total					***6.81***	***3.21***
Maximum (lbs/day) - Rail Site Construction						
Scrapers/graders	1	N/A	N/A	N/A	0.39	0.04
Dozers/Excavators	N/A	3.00	N/A	N/A	8.37	4.60
Truck Loading	N/A	N/A	N/A	N/A	0.01	0.00
Total					***8.76***	***4.64***
Maximum (lbs/day) - Aerial Conveyor Construction						
Scrapers/graders	0	N/A	N/A	N/A	0.00	0.00
Dozers/Excavators	N/A	4.00	N/A	N/A	11.16	6.13
Truck Loading	N/A	N/A	N/A	N/A	0.01	0.00
Total					***11.16***	***6.13***

SSFL Transportation Feasibility Analysis

Construction Emissions

GHG Emissions

Table 2-12: GHG Emissions Edison Road and Overland Conveyor Route Construction

	Edison Road Construction				*Overland Conveyor Route*			
	#	CO_2	CH_4[1]	CO_2e	#	CO_2	CH_4[1]	CO_2e
Rubber Tired Dozers	0	0	0	0	2	0.805357	0.000243	0.8056
Tractors/Loaders/Backhoes	2	0.293635097	8.84E-05	0.293724	2	0.293635	8.84E-05	0.293724
Graders	2	0.627707594	0.000189	0.627897	1	0.313854	9.45E-05	0.313948
Excavators	4	0.973118714	0.000294	0.973413	0	0	0	0
Scrapers	4	2.831271706	0.000335	2.831607	0	0	0	0
cranes	0	0	0	0	2	0.555355	4.36E-05	0.555399
Forklifts	0	0	0	0	0	0	0	0
auger	0	0	0	0	0	0	0	0
Blast Regulator	0	0	0	0	0	0	0	0
Curb Gutter Cast	0	0	0	0	0	0	0	0
Railroad Tamper	0	0	0	0	0	0	0	0
Paver	0	0	0	0	0	0	0	0
Paving Equipment	1	0.191912409	1.62E-06	0.191914	0	0	0	0
Compactor	1	0.015639588	3.72E-05	0.015677	0	0	0	0
Roller compactor	0	0	0	0	0	0	0	0
welders	0	0	0	0	2	0.188221	0	0.188221
Water Truck	4	0.929531205	0.046477	0.976008	0	0	0	0
Service Truck	0	0	0	0	4	0.200199	0.01001	0.210209
Onstie Total				5.910238				2.3671
Dump Truck (VCAPCD)	10	0.292285923	0.014614	0.3069	0	0	0	0
Dump Truck (SCAQMD)	10	0.505561694	0.025278	0.53084	0	0	0	0
Dump Truck (Total)	10	0.516406225	0.02582	0.542227	0	0	0	0
Worker (VCAPCD)	36	0.627022266	0.031351	0.658373	12	0.209007	0.01045	0.219458
Worker (SCAQMD)	36	0.792386375	0.039619	0.832006	12	0.264129	0.013206	0.277335
Worker (Total)	36	0.80079472	0.04004	0.840834	12	0.266932	0.013347	0.280278
Total Daily				7.293299				2.647378
Days per year				260				243.75
Total Annual				1,896				645
Annual Onsite				1,537				577
Annual Offsite				360				68
Annual Offsite (VCAPCD)				251				53
Annual Offsite (SCAQMD)				354				68

[1] emissions are already in CO_2e format so columns add

SSFL Transportation Feasibility Analysis

Construction Emissions

GHG Emissions

Table 2-13: GHG Emissions Truck Site and Overland Rail Site Construction

	Truck Site Development				*Rail Site Development*			
	#	CO_2	CH_4[1]	CO_2e	#	CO_2	CH_4[1]	CO_2e
Rubber Tired Dozers	0	0	0	0	2	0.805357	0.805357	1.610713
Tractors/Loaders/Backhoes	3	0.440452646	0.000133	0.440585	2	0.293635	0.293635	0.58727
Graders	2	0.627707594	0.000189	0.627897	1	0.313854	0.313854	0.627708
Excavators	2	0.486559357	0.000147	0.486706	1	0.24328	0.24328	0.486559
Scrapers	1	0.707817926	8.38E-05	0.707902	0	0	0	0
cranes	1	0.277677615	2.18E-05	0.277699	1	0.277678	0.277678	0.555355
Forklifts	0	0	0	0	1	0.071995	0.071995	0.14399
auger	1	0.443881152	0	0.443881	0	0	0	0
Blast Regulator	0	0	0	0	1	0	0	0
Curb Gutter Cast	1	0.221256716	8.78E-05	0.221345	0	0	0	0
Railroad Tamper	0	0	0	0	1	0.294339	0.294339	0.588677
Paver	0	0	0	0	1	0.221257	0.221257	0.442513
Paving Equipment	0	0	0	0	0	0	0	0
Compactor	2	0.031279177	7.44E-05	0.031354	1	0.01564	0.01564	0.031279
Roller compactor	2	0.247187848	4.57E-05	0.247234	0	0	0	0
welders	0	0	0	0	0	0	0	0
Water Truck	0	0	0	0	0	0	0	0
Service Truck	20	1.0009934	0.05005	1.051043	0	0	0	0
Onstie Total				4.535645				5.074066
Dump Truck (VCAPCD)	20	0.584571847	0.029229	0.6138	2	0.058457	0.058457	0.116914
Dump Truck (SCAQMD)	20	1.011123388	0.050556	1.06168	2	0.101112	0.101112	0.202225
Dump Truck (Total)	20	1.03281245	0.051641	1.084453	2	0.103281	0.103281	0.206562
Worker (VCAPCD)	30	0.522518555	0.026126	0.548644	10	0.174173	0.174173	0.348346
Worker (SCAQMD)	30	0.66032198	0.033016	0.693338	10	0.220107	0.220107	0.440215
Worker (Total)	30	0.667328933	0.033366	0.700695	10	0.222443	0.222443	0.444886
Total Daily				6.320794				5.725514
Days per year				81.25				81.25
Total Annual				514				465
Annual Onsite				369				412
Annual Offsite				145				53
Annual Offsite (VCAPCD)				94				38
Annual Offsite (SCAQMD)				143				52

[1] emissions are already in CO_2e format so columns add

SSFL Transportation Feasibility Analysis

Construction Emissions

GHG Emissions

Table 2-14: GHG Emissions Aerial Conveyor Construction

	Aerial Converyor Construction			
	#	CO_2	CH_4[1]	CO_2e
Rubber Tired Dozers	2	0.805356739	0.000243	0.8056
Tractors/Loaders/Backhoes	0	0	0	0
Graders	0	0	0	0
Excavators	2	0.486559357	0.000147	0.486706
Scrapers	0	0	0	0
cranes	2	0.55535523	4.36E-05	0.555399
Forklifts	2	0.143990124	0.000267	0.144257
auger	0	0	0	0
Blast Regulator	0	0	0	0
Curb Gutter Cast	0	0	0	0
Railroad Tamper	0	0	0	0
Paver	0	0	0	0
Paving Equipment	0	0	0	0
Compactor	0	0	0	0
Roller compactor	0	0	0	0
welders	0	0	0	0
Water Truck	0	0	0	0
Service Truck	2	0.10009934	0.005005	0.105104
Onstie Total				2.097067
Dump Truck (VCAPCD)	2	0.058457185	0.002923	0.06138
Dump Truck (SCAQMD)	2	0.101112339	0.005056	0.106168
Dump Truck (Total)	2	0.103281245	0.005164	0.108445
Worker (VCAPCD)	22	0.383180274	0.019159	0.402339
Worker (SCAQMD)	22	0.484236118	0.024212	0.508448
Worker (Total)	22	0.489374551	0.024469	0.513843
Total Daily				2.719355
Days per year				178.75
Total Annual				486
Annual Onsite				375
Annual Offsite				111
Annual Offsite (VCAPCD)				83
Annual Offsite (SCAQMD)				110

[1] emissions are already in CO_2e format so columns add

Emissions determined by multiplying the numbe of each equipment type by the emissions per day for each piece of equipment (Table 1-8).

Transportation Feasibility Study
Air Quality and GHG
Operational Emissions Assumptions

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Operational

96	Trucks per day (AQ)	
80	Trucks per day (GHG)	
48	Trucks per day Backfill (for rail transport of contaminated soils)	
21	days per month operation	
0.05	CH_4 percentage based on CO_2	
113	Distance to clean fill sites (uses average disance for non-hazardous disposal sites for all of the RP's. 115 miles for Boeing, 125 miles for DOE, and 98 miles for NASA)	
1,550	rail miles to Oregon for 691,170 CY of hazardous waste	
	0.82	Miles within Ventura County
	111	Miles within SCAQMD
	1,438.18	Rest
900	rail miles to Utah for 1,363,300 CY of non-hazardous waste	
	0.82	Miles within Ventura County
	111	Miles within SCAQMD
	788.18	Rest
734	CY per day to rail site	
70	gondola cars	
4,900	CY of Material per train	
7,350	tons of material	
41	ABC cars	
3,760	CY of Material per train	
5,650	tons of material	
1 or 2	trains per week	

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Operational

Notes:

1 Operational Emissions for trucks calculated using the "mitigated" scenario and assues 2014 or newer trucks.

2 In order to show a true comparison between alternatives, the total emissions (including all emissions outside the VCAPCD and SCAQMD jurrisdictions) are shown for the trucking routes. The EIR analysis shows only the emissions from within CA and predominantly within the VCAPCD and SCAQMD, therefore the totals presented in the Feasibility Study will not necessarily match totals presented in the EIR Analysis. Additionally, the EIR analysis shows onsite equipment emissions and worker travel, which for operational activities would not change regardless of the alternative implemented and therefore are not included as part of the Feasibility Study.

3 Emissions from haul trucks for the "Program" level analysis was used for trucking comparisons.

4 For Truck emissions associated with the non-Woolsey Canyon Road Alternatives, a portion of the emissions from the Project Site along Woolsey Canyon Roady to the I-118 at the CA-27 exit are removed from the Woolsey Canyon Rd Emissions estimates and replaced with emissions from the Truck Site to the intersection of the I-118 and CA-27 as all disposal sites used for emissions determinations, are located east of this intersection.

5 Assumes trains go from the site to Colton prior to heading north out of state. SCAQMD district ends at approximately Cajon Junction.

6 Assumes all trains in one year go to Oregon (worse case scenario). Also assumes 1 train per week. Assumes an average of 24 mph for the train.[1].

1	train per week	
52	weeks	
7,350	tons per train	
64.58333	hours per trip to Oregon	2.690972 days
576	Miles per day (24 hours/24 mph)	

https://www.statista.com/statistics/547745/average-train-speed-union-pacific-railroad/

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Emissions Per Disposal Truck

Emissions from Project site at Woolsey Canyon to the intersection of I-118 and CA-27.

Miles one way:	8.665	Total	0.42	VCAPCD	8.245	SCAQMD
Ave round trip miles:	17.33	Total	0.84	VCAPCD	16.49	SCAQMD

Table 3-1 Woolsey Canyon Emission Factors

lbs/mile						MT/mile	
VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
1.64E-04	1.78E-03	2.26E-03	3.53E-05	1.04E-05	9.91E-06	1.58E-03	7.89E-05

Source: Emfac 2014 - See Tables 3-11 through 3-14.

Table 3-2 Woolsey Canyon Emissions per Truck

	lbs/mile						MT/mile	
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
0.84 Miles VCAPCD	1.38E-04	1.50E-03	1.90E-03	2.96E-05	8.70E-06	8.32E-06	1.33E-03	6.63E-05
16.49 Miles SCAQMD	2.71E-03	2.94E-02	3.73E-02	5.82E-04	1.71E-04	1.63E-04	2.60E-02	1.30E-03

Emissions per truck are determined by multiplying the emission factors in Table 3-1 by the number of miles associated with each air district.

Emissions from Truck Site to the intersection of I-118 and CA-27.

Miles one way:	11.31	Total	9.53	VCAPCD	1.78	SCAQMD
Round Trip Miles:	22.62	Total	19.06	VCAPCD	3.56	SCAQMD

Table 3-3 Truck Route Emission Factors

lbs/mile						MT/mile	
VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
1.08E-04	9.42E-04	1.62E-03	3.53E-05	9.69E-06	9.27E-06	1.44E-03	7.20E-05

Source: Emfac 2014 - See Tables 3-11 through 3-14.

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Emissions Per Disposal Truck

Table 3-4 Truck Route Emission per Truck

	lbs/mile						MT/mile	
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
19.06 Miles VCAPCD	2.07E-03	1.80E-02	3.10E-02	6.72E-04	1.85E-04	1.77E-04	2.75E-02	1.37E-03
3.56 Miles SCAQMD	3.86E-04	3.35E-03	5.78E-03	1.26E-04	3.45E-05	3.30E-05	5.13E-03	2.56E-04

Emissions per truck are determined by multiplying the emission factors in Table 3-3 by the number of miles associated with each air district.

Table 3-5 Truck Emissions Per Day and Year

	lbs/day						MT/year	
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
	From Woolsey Canyon to I-118 @ CA-27							
	VCAPCD							
96.5 Trucks/day	1.33E-02	1.44E-01	1.83E-01	2.84E-03	8.35E-04	7.99E-04	-	-
80.3 Trucks/day	-	-	-	-	-	-	2.67E+01	1.34E+00
	SCAQMD							
96.5 Trucks/day	2.60E-01	2.82E+00	3.59E+00	5.58E-02	1.64E-02	1.57E-02	-	-
80.3 Trucks/day	-	-	-	-	-	-	5.25E+02	2.62E+01
	lbs/day						**MT/mile**	
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
	From Truck Site to I-118 @ CA-27							
	VCAPCD							
96.5 Trucks/day	1.99E-01	1.72E+00	2.97E+00	6.45E-02	1.77E-02	1.70E-02	-	-
80.3 Trucks/day	-	-	-	-	-	-	5.54E+02	2.77E+01
	SCAQMD							
96.5 Trucks/day	3.71E-02	3.22E-01	5.55E-01	1.21E-02	3.31E-03	3.17E-03	-	-
80.3 Trucks/day	-	-	-	-	-	-	1.03E+02	5.17E+00

Emissions per day and per year were determined by multiplying the emissions per truck (Tables 3-2 and 3-4) by the number of trucks per day/per year.

SSFL Transportation Feasibility Analysis
Overall Feasibility Study
Emissions Per Backfill Truck

Emissions Estimates for Backfill Trucks

Table 3-6 Backfill Trucks Average Mileage

	one way				Round
	Boeing	DOE	NASA	Average	Trip
VCAPCD	10.29	0.42	10.29	7	14
SCAQMD	67.58	67.58	53.58	62.9133	125.827
Other	37.13	57	34.13	42.7533	85.5067
Total	115	125	98	112.667	225.333

Distance within air district is based on the location of the assumed landfill.

Table 3-7 Emission Factors for Backfill Trucks

lbs/mile						MT/mile	
VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
1.64E-04	1.78E-03	2.26E-03	3.53E-05	1.04E-05	9.91E-06	1.58E-03	7.89E-05

Source: Emfac 2014 - See Tables 3-11 through 3-14.

Table 3-8 Emissions per Backfill Truck

	lbs/truck						MT/mile	
	VOC	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**	**CO_2**	**CH_4**
14 Miles VCAPCD	2.30E-03	2.50E-02	3.17E-02	4.94E-04	1.45E-04	1.39E-04	2.21E-02	1.10E-03
125.83 Miles SCAQMD	2.07E-02	2.24E-01	2.85E-01	4.44E-03	1.30E-03	1.25E-03	1.99E-01	9.93E-03
85.51 Miles Other	1.41E-02	1.53E-01	1.94E-01	3.02E-03	8.85E-04	8.47E-04	1.35E-01	6.75E-03

Emissions per truck are determined by multiplying the emission factors in Table 3-7 by the number of miles associated with each air district (Table 3-6).

Santa Susana Truck and Conveyor Feasibility Study
GHG Emissions from Conveyor Operations

Table 3-9: Surface Conveyor

440,160 kWh/month
5,281,920 Kwh/year
5,282 MWh/yr

	Emission Factor (lbs/MWh)[1]	Emissions (Metric Ton)	Global Warming Potential	CO_2e (MT/Yr)	Total CO_2e (MT/Yr)
CO_2	630.89	1,511.51	1	1,511.51	
CH_4	0.029	0.07	25	1.74	
N_2O	0.006	0.01	298	4.28	
Total					1,517.53

1 Intensity Factors taken from CalEEMod.
kWh/month provided as part of the project description

Table 3-10: Aerial Conveyor

58,968 kWh/month
707,616 Kwh/year
708 MWh/yr

	Emission Factor (lbs/MWh)[1]	Emissions (Metric Ton)	Global Warming Potential	CO_2e (MT/Yr)	Total CO_2e (MT/Yr)
CO_2	630.89	202.50	1	202.50	
CH_4	0.029	0.01	25	0.23	
N_2O	0.006	0.00	298	0.57	
Total					203.30

kWh/mont Intensity Factors taken from CalEEMod.
kWh/month provided as part of the project description

SSFL Transportation Feasibility Study
EMFAC 2014 Emission Factors

2014 Vehicle Fleet

Table 3-11 EMFAC 2014 Emission Factors by Speed and County

gr/mile								
County	**Speed**	**VOC**	**CO**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**
Ventura	55	0.02	0.14	0.39	0.02	0.004	0.004	1330.63
	30	0.11	1.09	1.48	0.02	0.005	0.005	1670.02
	35	0.07	1.25	0.97	0.02	0.005	0.004	1668.07
	40	0.06	0.66	0.75	0.02	0.004	0.004	1539.66
	45	0.04	0.46	0.58	0.02	0.004	0.004	1475.92
	15	0.23	8.52	5.49	0.02	0.006	0.006	2582.03
Los Angeles	55	0.02	0.14	0.39	0.02	0.004	0.004	1339.74
	30	0.11	0.88	1.52	0.02	0.005	0.005	1641.92
	35	0.08	0.99	1.02	0.02	0.005	0.005	1622.68
	40	0.06	0.62	0.76	0.02	0.004	0.004	1531.19
	45	0.04	0.42	0.59	0.02	0.004	0.004	1466.28
lbs/mile								**MT/mile**
County	**Speed**	**VOC**	**CO**	**Nox**	**Sox**	**PM10**	**PM2.5**	**CO2**
Ventura	55	5.24E-05	3.09E-04	8.60E-04	3.53E-05	8.32E-06	7.96E-06	1.33E-03
	30	2.34E-04	2.40E-03	3.26E-03	3.53E-05	1.13E-05	1.08E-05	1.67E-03
	35	1.65E-04	2.76E-03	2.14E-03	3.53E-05	1.01E-05	9.70E-06	1.67E-03
	40	1.26E-04	1.46E-03	1.65E-03	3.53E-05	9.70E-06	9.28E-06	1.54E-03
	45	9.32E-05	1.02E-03	1.28E-03	3.53E-05	9.13E-06	8.73E-06	1.48E-03
	15	5.05E-04	1.88E-02	1.21E-02	3.53E-05	1.34E-05	1.28E-05	2.58E-03
Los Angeles	55	5.24E-05	3.09E-04	8.61E-04	3.53E-05	8.32E-06	7.96E-06	1.34E-03
	30	2.39E-04	1.94E-03	3.36E-03	3.53E-05	1.15E-05	1.10E-05	1.64E-03
	35	1.71E-04	2.18E-03	2.24E-03	3.53E-05	1.04E-05	9.99E-06	1.62E-03
	40	1.28E-04	1.37E-03	1.68E-03	3.53E-05	9.85E-06	9.42E-06	1.53E-03
	45	9.44E-05	9.36E-04	1.30E-03	3.53E-05	9.26E-06	8.86E-06	1.47E-03
Maximum Emission Factor By Speed								
		lbs/mile						**MT/mile**
	Speed	**VOC**	**CO**	**NOx**	**SOx**	**PM_{10}**	**$PM_{2.5}$**	**CO_2**
	30	2.39E-04	2.40E-03	3.36E-03	3.53E-05	1.15E-05	1.10E-05	1.67E-03
	35	1.71E-04	2.76E-03	2.24E-03	3.53E-05	1.04E-05	9.99E-06	1.67E-03
	40	1.28E-04	1.46E-03	1.68E-03	3.53E-05	9.85E-06	9.42E-06	1.54E-03
	45	9.44E-05	9.36E-04	1.30E-03	3.53E-05	9.26E-06	8.86E-06	1.47E-03
	55	5.56E-05	3.28E-04	9.48E-04	3.53E-05	9.00E-06	8.61E-06	1.34E-03

Emissions taken from EMFAC 2014

EMFAC2014 (v1.0.7) Emission Rates
Region Type: County
Region: Ventura, Los Angeles
Calendar Year: 2017, model year 2014
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW

SSFL Transportation Feasibility Study
EMFAC 2014 Emission Factors

2014 Vehicle Fleet

Table 3-12 Haul Routes

Route				Speed	Miles
1,2	Woolsey Canyon Road	7.88 meters		30	2.11
1	Valley Circle Blvd	7.65	north of woolsey	30	0.21
2	Roscoe Blvd	19.33		40	2.33
2	Topanga Canyon Blvd	24.12	north of Roscoe	45	1.7
1	Lake Manor Dr	6.67		30	1.33
2	Valley Circle Blvd	6.93	north of Roscoe	35	1.11
1	Plummer St	13.52		35	0.87
1,2	Topanga Canyon Blvd	25.42	north of Plummer	45	2.44
Distance by Speed					
			MPH	**Route 1**	**Route 2**
			30	3.99	2.45
			35	0.87	1.11
			40		2.33
			45	2.44	4.14
			Total	7.3	10.03

Distance based on anticipated haul routes as detailed in text. Speed determined from Google Earth.

Table 3-13 Emission Factor Determination: Woolsey Canyon Route from Site to I-118 @ CA 27

Route		lbs/mile						MT/mile
		VOC	CO	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2
	Route 1	1.83E-04	1.95E-03	2.54E-03	3.53E-05	1.06E-05	1.02E-05	1.60E-03
	Route 2	1.46E-04	1.62E-03	1.99E-03	3.53E-05	1.01E-05	9.64E-06	1.56E-03
	Average	1.64E-04	1.78E-03	2.26E-03	3.53E-05	1.04E-05	9.91E-06	1.58E-03
Average Miles		8.665						

Weighted averages are determined by multiplying the distance per speed (Table 3-12) by the maximum emission factor by speed (Table 3-11).

Table 3-14 Emission Factor Determination: Truck Site 1 to I-118 @ CA 27

Speed	Distance (miles)	ROG	CO	NOX	SOx	PM10	PM2.5	CO2
		lb/mile (Within Ventura County)						
30 MPH	3	7.18E-04	7.19E-03	1.01E-02	1.06E-04	3.45E-05	3.30E-05	5.01E-03
45 MPH	1.21	1.14E-04	1.13E-03	1.57E-03	4.27E-05	1.12E-05	1.07E-05	1.77E-03
55 MPH	7.1	3.95E-04	2.33E-03	6.73E-03	2.50E-04	6.39E-05	6.11E-05	9.51E-03
Total	11.31	1.23E-03	1.07E-02	1.84E-02	3.99E-04	1.10E-04	1.05E-04	1.63E-02
Average lb/mile		1.08E-04	9.42E-04	1.62E-03	3.53E-05	9.69E-06	9.27E-06	1.44E-03

Weighted averages are determined by multiplying the distance per speed by the maximum emission factor by speed (Table 3-11).

Transportation Feasibility Study
Air Quality and GHG
Operational Truck Emissions Calculations

SSFL Transportation Feasibility Analysis
Emissions Summary
Operational Emissions

Data for thesesummary tables were pulled from Tables: 4-6 to 4-13, 5-1 and 5-2.

Table 4-1: Woolsey Canyon Road Truck Route - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Route (Total)	3	50	19	2	0	0	11,128
Truck Route (VCAPCD)	0	1	1	0	0	0	216
Truck Route (SCAQMD)	1	24	9	1	0	0	5,149
Train Emissions	0	0	0	0	0	0	0
Converyor Emissions	-	-	-	-	-	-	0
Total	3	50	19	2	0	0	11,128
Total (VCAPCD)	0	1	1	0	0	0	216
Total (SCAQMD)	1	24	9	1	0	0	5,149
	Tons/year						
Total	<1	7	2	<1	<1	<1	
Total (VCAPCD)	<1	<1	<1	<1	<1	<1	
Total (SCAQMD)	<1	3	1	<1	<1	<1	

Table 4-2: Edison Road Truck Route - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Route (Total)	2	37	14	1	0	0	11,184
Truck Route (VCAPCD)	0	2	2	0	0	0	384
Truck Route (SCAQMD)	1	11	3	0	0	0	2,353
Train Emissions	0	0	0	0	0	0	0
Converyor Emissions	-	-	-	-	-	-	0
Total	2	37	14	1	0	0	11,184
Total (VCAPCD)	0	2	2	0	0	0	384
Total (SCAQMD)	1	11	3	0	0	0	2,353
	Tons/year						
Total	<1	5	2	<1	<1	<1	
Total (VCAPCD)	<1	<1	<1	<1	<1	<1	
Total (SCAQMD)	<1	1	<1	<1	<1	<1	

SSFL Transportation Feasibility Analysis
Emissions Summary
Operational Emissions

Data for thesesummary tables were pulled from Tables: 4-6 to 4-13, 5-1 and 5-2.

Table 4-3: Edison Road Overland Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Route (Total)	2	37	14	1	0	0	11,184
Truck Route (VCAPCD)	0	2	2	0	0	0	384
Truck Route (SCAQMD)	1	11	3	0	0	0	2,353
Train Emissions	0	0	0	0	0	0	0
Converyor Emissions	-	-	-	-	-	-	1,518
Total	2	37	14	1	0	0	12,701
Total (VCAPCD)	0	2	2	0	0	0	1,902
Total (SCAQMD)	1	11	3	0	0	0	2,353
	Tons/year						
Total	<1	5	2	<1	<1	<1	
Total (VCAPCD)	<1	<1	<1	<1	<1	<1	
Total (SCAQMD)	<1	1	<1	<1	<1	<1	

Table 4-4: North American Cutoff Overland Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Route	2	19	24	0	0	0	3,777
Truck Route (VCAPCD)	0	1	2	0	0	0	290
Truck Route (SCAQMD)	1	11	14	0	0	0	2,603
Train Emissions (Total)	146	2,342	545	38	93	91	13,937
Train (VCAPCD)	0	3	1	0	0	0	7
Train (SCAQMD)	28	451	105	7	18	17	998
Converyor Emissions	-	-	-	-	-	-	2,049
Total (lbs/day)	176	2,816	675	46	112	108	19,762
VCAPCD	0	5	2	0	0	0	2,346
SCAQMD	29	462	119	8	18	18	3,601
	Tons/year						
Total	23	366	88	6	15	14	
VCAPCD	<1	1	<1	<1	<1	<1	
SCAQMD	4	60	15	1	2	2	

SSFL Transportation Feasibility Analysis

Emissions Summary

Operational Emissions

Data for thesesummary tables were pulled from Tables: 4-6 to 4-13, 5-1 and 5-2.

Table 4-5: North American Cutoff Aerial Conveyor - Emissions Summary

	Lbs/Day						*MT/year*
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Truck Route	2	19	24	0	0	0	3,777
Truck Route (VCAPCD)	0	1	2	0	0	0	290
Truck Route (SCAQMD)	1	11	14	0	0	0	2,603
Train Emissions (Total)	146	2,342	545	38	93	91	13,937
Train (VCAPCD)	0	3	1	0	0	0	7
Train (SCAQMD)	28	451	105	7	18	17	998
Converyor Emissions	-	-	-	-	-	-	274
Total (lbs/day)	177	2828	691	47	112	108	21,886
VCAPCD	0	5	2	0	0	0	571
SCAQMD	29	462	119	8	18	18	3875
	Tons/year						
Total	23	368	90	6	15	14	
VCAPCD	<1	1	<1	<1	<1	<1	
SCAQMD	4	60	15	1	2	2	

SSFL Transportation Feasibility Analysis
Operational Haul Truck Route Emissions
Criteria Pollutant Emissions

Table 4-6 Truck Emissions - Woolsey Canyon Road Truck Route

	Lbs/Day					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Offsite VCAPCD	0.09	1.42	0.59	0.05	0.01	0.01
Offsite SCAQMD	1.41	23.69	8.88	0.84	0.22	0.21
Offsite (Other)	1.50	25.11	9.47	0.89	0.23	0.22
Total	2.99	50.23	18.94	1.78	0.46	0.44
	Tons/year					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Total	<1	7	2	<1	<1	<1

Source: Table 7-1 from the AQ Appendix

Table 4-7: **Change in Truck Emissions (difference between routes)**

	Lbs/Day					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
	VCAPCD					
Original Offsite VCAPCD	0.04	0.71	0.30	0.02	0.01	0.01
Woolsey Canyon to I-118	6.63E-03	7.19E-02	9.13E-02	1.42E-03	4.17E-04	3.99E-04
Truck Route 1 to I-118	9.93E-02	8.62E-01	1.49E+00	3.23E-02	8.87E-03	8.48E-03
Total New Offsite VCAPCD	1.36E-01	1.50E+00	1.69E+00	5.46E-02	1.46E-02	1.39E-02
	SCAQMD					
Original Offsite SCAQMD	0.71	11.85	4.44	0.42	0.11	0.10
Woolsey Canyon to I-118	1.30E-01	1.41E+00	1.79E+00	2.79E-02	8.19E-03	7.84E-03
Truck Route 1 to I-118	1.85E-02	1.61E-01	2.78E-01	6.03E-03	1.66E-03	1.58E-03
Total New Offsite SCAQMD	5.94E-01	1.06E+01	2.93E+00	4.00E-01	1.02E-01	9.72E-02

Sources: Tables 3-5 and 4-6

SSFL Transportation Feasibility Analysis
Operational Haul Truck Route Emissions
Criteria Pollutant Emissions

Table 4-8 Haul Emissions: Edison Road Truck Route & Edison Road Overland Conveyor

	Lbs/Day					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Woolsey Canyon Route						
Offsite (VCAPCD)	0.04	0.71	0.30	0.02	0.01	0.01
Offsite (SCAQMD)	0.71	11.85	4.44	0.42	0.11	0.10
Total	0.75	12.56	4.74	0.45	0.11	0.11
Edison Road Route						
Offsite (VCAPCD)	0.14	1.50	1.69	0.05	0.01	0.01
Offsite (SCAQMD)	0.59	10.60	2.93	0.40	0.10	0.10
Total	0.73	12.10	4.62	0.45	0.12	0.11
(Other)	1.50	25.11	9.47	0.89	0.23	0.22
Grand Total	2.23	37.21	14.09	1.35	0.34	0.33
	Tons/year					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Total	<1	5	2	<1	<1	<1

*Assumes half of the trucks stay on Woolsey Canyon Route and half take Ediston Road.
Taken from Table 4-7

Talbe 4-9: Haul Emissions: North American Cutoff Overland Or Aerial Conveyor

	Lbs/Day					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Offsite (VCAPCD)	0.11	1.20	1.52	0.02	0.01	0.01
Offsite (SCAQMD)	0.99	10.78	13.68	0.21	0.06	0.06
Offsite (Other)	0.67	7.32	9.30	0.14	0.04	0.04
Total	1.78	19.30	24.50	0.38	0.11	0.11
	Tons/year					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Total	<1	3	3	<1	<1	<1

*No Disposal Emissions, the emissions presented here represent backfill emissions.
Source: Table 3-8 times the number of trucks per day

SSFL Transportation Feasibility Analysis
Operational Haul Truck Route Emissions
GHG Emissions

Table 4-10: Truck Emissions - Woolsey Canyon Road Truck Route - GHG

	MT CO_2e / year		
	CO_2	CH_4	CO_2e
VCAPCD	205	10	216
SCAQMD	4,904	245	5,149
Other	5,489	274	5,763
Program Analysis Total	10,598	530	11,128
Source:	Tables 7-4, 7-6, and 7-8 from the GHG Appendix		

Table 4-11: **Change in Truck Emissions (difference between routes) - GHG**

	MT CO_2e / year		
	CO_2	CH_4	CO_2e
	VCAPCD		
Original Offsite VCAPCD	103	5	108
Woolsey Canyon to I-118	13	1	14
Truck Route 1 to I-118	277	14	291
Total New Offsite VCAPCD	366	18	384
	SCAQMD		
Original Offsite SCAQMD	2,452	123	2,575
Woolsey Canyon to I-118	262	13	276
Truck Route 1 to I-118	52	3	54
Total New Offsite SCAQMD	2,241	112	2,353

Sources: Tables 3-5 and 4-106

SSFL Transportation Feasibility Analysis
Operational Haul Truck Route Emissions
GHG Emissions

Table 4-12: Haul Emissions: Edison Road Truck Route & Edison Road Overland Conveyor - GHG

	MT CO_2e / year		
	CO_2	CH_4	CO_2e
Woolsey Canyon Route			
Offsite (VCAPCD)	103	5	108
Offsite (SCAQMD)	2,452	123	2,575
Total	2,555	128	2,682
Edison Road Route			
Offsite (VCAPCD)	366	18	384
Offsite (SCAQMD)	2,241	112	2,353
Total	2,608	130	2,738
(Other)	5,489	274	5,763
Grand Total	10,651	533	11,184

*Assumes half of the trucks stay on Woolsey Canyon Route and half take Ediston Road.

Taken from Table 4-11

Table 4-13: Haul Emissions: North American Cutoff Overland Or Aerial Conveyor - GHG

	MT CO_2e / year		
	CO_2	CH_4	CO_2e
VCAPCD	276	14	290
SCAQMD	2,479	124	2,603
Other	842	42	884
Total	3,597	180	3,777

*No Disposal Emissions, the emissions presented here represent backfill emissions.

Source: Table 3-8 times the number of trucks per year

Transportation Feasibility Study
Air Quality and GHG
Operational Train Emissions Calculations

SSFL Transportation Feasibility Analysis

Operational Train Emissions

Criteria Pollutant Emissions

Woolsey Canyon Road Truck Route

or Edison Road Truck Route

or Edison Road Overland Conveyor

No Train Emissions as the all soil is disposed of by truck.

North American Cutoff Overland Conveyor

or North American Cutoff Aerial Conveyor

0.82	miles within Venture County	2.69	days per train
111	Miles within SCAQMD	104	trains per year
464.18	Remaining miles per day	280	days per year

Table 5-1: Train Emissions

	Lbs/Day					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Offsite (VCAPCD)	0.21	3.33	0.78	0.05	0.13	0.13
Offsite (SCAQMD)	28.14	451.32	105.03	7.42	18.02	17.48
Offsite (Other)	117.68	1887.31	439.23	31.02	75.35	73.09
Total	146.03	2341.96	545.04	38.49	93.50	90.69
	Tons/year					
	VOC	**NOx**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Total	20	328	76	5	13	13

Emissions determined by multiplying emission factors (Table: 1-11) by the miles per air district.

SSFL Transportation Feasibility Analysis
Operational Train Emissions
GHG Emissions

Woolsey Canyon Road Truck Route
or Edison Road Truck Route
or Edison Road Overland Conveyor

No Train Emissions as the all soil is disposed of by truck.

North American Cutoff Overland Conveyor
or North American Cutoff Aerial Conveyor

0.82 miles within Venture County
111 Miles within SCAQMD
1,438.18 Remaining miles per day
52 trains per year (scenario 1)

Table 5-2: Train Emissions - GHG

	MT CO_2e / year		
	CO_2	CH_4	CO_2e
VCAPCD	7	0	7
SCAQMD	951	48	998
Other	12,316	616	12,932
Total	13,273	664	13,937

Emissions determined by multiplying emission factors (Table: 1-11) by the miles per air district.

APPENDIX D

Energy Usage Data

Santa Susana Field Laboratory
Fuel Conversion - Unmitigated

Construction Fuel Consumption Summary - Initial Programs

	gallons/year		Constructin Length
	Diesel	**Gas**	**Combined Total**
Initial Clean-up - 48 Trucks per day - by Activity			
Area IV	542,768	7,136	
Liquid O_2	142,680	7,136	
Demolition- Boeing	0	0	
Demolition - DOE	66,989	16,414	
TTF - Boeing	53,179	5,709	
RMHF/HWMF - DOE	96,802	14,273	
Total	***902,419***	***50,669***	***953,088***
Initial Clean-up - 48 Trucks per day - by RP			
Boeing	*53,179*	*5,709*	
DOE	*706,560*	*37,823*	
NASA	*142,680*	*7,136*	
Initial Clean-up - 96 trucks per day - by Activity			
Area IV	1,037,817	7,136	
Liquid O2	237,640	7,136	
Demolition- Boeing	0	0	
Demolition - DOE	100,560	16,414	
TTF - Boeing	67,557	5,709	
RMHF/HWMF - DOE	116,003	14,273	
Total	***1,559,577***	***50,669***	***1,610,246***
Initial Clean-up - 96 Trucks per day - by RP			
Boeing	*67,557*	*5,709*	
DOE	*1,254,380*	*37,823*	
NASA	*237,640*	*7,136*	

Initial Clean-up - 96 Trucks per day - by source

	gallons/year	
	Diesel	**Gas**
Construction Equipment	197,542	0
Haul Trucks	324,219	0
Worker Commute	0	43,532

Assumptions

10.15	diesel	KgCO2/gallon[1]
8.91	gasoline	KgCO2/gallon[1]
1	MT = 1,000 kilograms	

Construction	diesel	Used for trucks (haul and vendor) and off-road equipment
	gasoline	worker vehicles

*Mitigated and unmitigated emissions will be the same as vehicle use does not change.

1 U.S. Energy Information Administration Voluntary Reportion of Greenhouse Gases

Santa Susana Field Laboratory

Fuel Conversion - Initial Clean-up by Activity (gal/year) - Unmitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Area IV						
48 Trucks						
Off-road	484	diesel	10.15	47,719		
Haul	5,025	diesel	10.15	495,049		
Worker	64	gasoline	8.91	7,136	542,768	7,136
96 Trucks						
Off-road	484	diesel	10.15	47,719		
Haul	10,049	diesel	10.15	990,098		
Worker	63.59	gasoline	8.91	7,136	1,037,817	7,136
Liquid O_2						
48 Trucks						
Off-road	484	diesel	10.15	47,719		
Haul	964	diesel	10.15	94,960		
Worker	64	gasoline	8.91	7,136	142,680	7,136
96 Trucks						
Off-road	484	diesel	10.15	47,719		
Haul	1,927.69	diesel	10.15	189,921		
Worker	63.59	gasoline	8.91	7,136	237,640	7,136
Demo - Boeing						
48 Trucks						
Off-road	0	diesel	10.15	0		
Haul	0	diesel	10.15	0		
Worker	0	gasoline	8.91	0	0	0
96 Trucks						
Off-road	0	diesel	10.15	0		
Haul	0	diesel	10.15	0		
Worker	0	gasoline	8.91	0	0	0
Demo - DOE						
48 Trucks						
Off-road	339	diesel	10.15	33,419		
Haul	341	diesel	10.15	33,571		
Worker	146	gasoline	8.91	16,414	66,989	16,414
96 Trucks						
Off-road	339	diesel	10.15	33,419		
Haul	681	diesel	10.15	67,141		
Worker	146	gasoline	8.91	16,414	100,560	16,414
TTF - Boeing						
48 Trucks						
Off-road	394	diesel	10.15	38,801		
Haul	146	diesel	10.15	14,378		
Worker	51	gasoline	8.91	5,709	53,179	5,709
96 Trucks						
Off-road	394	diesel	10.15	38,801		
Haul	292	diesel	10.15	28,756		
Worker	51	gasoline	8.91	5,709	67,557	5,709

Santa Susana Field Laboratory

Fuel Conversion - Initial Clean-up by Activity (gal/year) - Unmitigated

RMHF/HWMF - DOE						
48 Trucks						
Off-road	788	diesel	10.15	77,602		
Haul	195	diesel	10.15	19,200		
Worker	127	gasoline	8.91	14,273	96,802	14,273
96 Trucks						
Off-road	788	diesel	10.15	77,602		
Haul	390	diesel	10.15	38,400		
Worker	127	gasoline	8.91	14,273	116,003	14,273

Santa Susana Field Laboratory
Fuel Conversion - Unmitigated

Construction Fuel Consumption Summary - Overall Cleanup

	gallons/year		Constructin Length
	Diesel	**Gas**	**Combined Total**
	Program - 80 truks per day		
Boeing	410,467	106,398	
DOE	351,524	35,509	
NASA	594,748	35,509	
M&M	0	79,778	
Total	***1,356,739***	***257,194***	***1,613,933***
	Program - 96 truks per day		
Boeing	474,418	106,398	
DOE	411,883	35,509	
NASA	703,752	35,509	
M&M	0	79,778	
Total	***1,590,053***	***257,194***	***1,847,247***
	Program - 48 trucks per day		
Boeing	282,564	106,398	
DOE	230,806	35,509	
NASA	376,740	35,509	
M&M	0	79,778	
Total	***890,110***	***257,194***	***1,147,304***
	Program - 80 truks per day		
Construction Equipmer	190,167	0	
Haul Trucks	1,166,572	0	
Worker Commute	0	177,416	
M&M Commute	0	79,778	
	Program - 96 truks per day		
Construction Equipment	190,167	0	
Haul Trucks	1,399,886	0	
Worker Commute	0	177,416	
M&M Commute	0	79,778	

Santa Susana Field Laboratory

Fuel Conversion - Program - (gal/year)- Unmitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Boeing						
48 Trucks						
Off-road	921	diesel	10.15	90,708.71		
Haul	1,947	diesel	10.15	191,854.84		
Worker	948	gasoline	8.91	106,397.69	282,563.55	106,397.69
DOE						
48 Trucks						
Off-road	505	diesel	10.15	49,729.15		
Haul	1,838	diesel	10.15	181,076.75		
Worker	316	gasoline	8.91	35,509.17	230,805.90	35,509.17
NASA						
48 Trucks						
Off-road	505	diesel	10.15	49,729.15		
Haul	3,319	diesel	10.15	327,011.35		
Worker	316	gasoline	8.91	35,509.17	376,740.50	35,509.17
Maintenance and Monitoring						
48 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	711	gasoline	8.91	79,778.25	0	79,778

Santa Susana Field Laboratory

Fuel Conversion - Program - (gal/year) - Unmitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Boeing						
80 Trucks						
Off-road	921	diesel	10.15	90,708.71		
Haul	3,246	diesel	10.15	319,758.07		
Worker	948	gasoline	8.91	106,397.69	410,467	106,398
DOE						
80 Trucks						
Off-road	505	diesel	10.15	49,729.15		
Haul	3,063	diesel	10.15	301,794.58		
Worker	316	gasoline	8.91	35,509.17	351,524	35,509
NASA						
80 Trucks						
Off-road	505	diesel	10.15	49,729.15		
Haul	5,532	diesel	10.15	545,018.92		
Worker	316	gasoline	8.91	35,509.17	594,748	35,509
Maintenance and Monitoring - Boeing						
80 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	711	gasoline	8.91	79,778.25	0	79,778

Santa Susana Field Laboratory
Fuel Conversion - Unmitigated

Construction Fuel Consumption Summary - Existing Conditions

	gallons/year		Constructin Length
	Diesel	**Gas**	**Combined Total**
		Existing	
Boeing	0	23,097	
DOE	0	1,480	
NASA[1]	0	4,441	
Total	***0***	***29,019***	***29,019***

1 NASA was not active at the time of the NOP therefore emissions are not part of the Emissions.

Santa Susana Field Laboratory
Existing Activities (gal/year)

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Boeing						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	206	gasoline	8.91	23,097.00	0.00	23,097.00
DOE						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	13	gasoline	8.91	1,480.48	0.00	1,480.48
NASA						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	40	gasoline	8.91	4,441.44	0.00	4,441.44

Santa Susana Field Laboratory
Fuel Conversion - Mitigated

Construction Fuel Consumption Summary - Initial Projects

	gallons/year		Constructin Length
	Diesel	**Gas**	**Combined Total**
Initial Clean-up - 48 Trucks per day - by Activity			
Area IV	399,026	7,136	
Liquid O_2	114,109	7,136	
Demolition - Boeing	0	0	
Demolition - DOE	56,068	16,414	
TTF - Boeing	47,787	5,709	
RMHF/HWMF - DOE	113,481	14,273	
Total	***730,471***	***50,669***	***781,140***
Initial Clean-up - 48 Trucks per day - by RP			
Boeing	*47,787*	*5,709*	
DOE	*568,575*	*37,823*	
NASA	*114,109*	*7,136*	
Initial Clean-up - 96 trucks per day - by Activity			
Area IV	751,586	7,136	
Liquid O2	181,753	7,136	
Demolition - Boeing	0	0	
Demolition - DOE	79,971	16,414	
TTF - Boeing	58,027	5,709	
RMHF/HWMF - DOE	151,868	14,273	
Total	***1,223,205***	***50,669***	***1,273,873***
Initial Clean-up - 48 Trucks per day - by RP			
Boeing	*58,027*	*5,709*	
DOE	*983,424*	*37,823*	
NASA	*181,753*	*7,136*	

Initial Clean-up - 96 Trucks per day - by source

	gallons/year	
	Diesel	**Gas**
Construction Equipment	191,273	0
Haul Trucks	280,346	0
Worker Commute	0	43,532

Assumptions

10.15	diesel	KgCO2/gallon[1]
8.91	gasoline	KgCO2/gallon[1]
1	MT = 1,000 kilograms	

Construction diesel Used for trucks (haul and vendor) and off-road equipment
gasoline worker vehicles
*Mitigated and unmitigated emissions will be the same as vehicle use does not change.

1 U.S. Energy Information Administration Voluntary Reportion of Greenhouse Gases

Santa Susana Field Laboratory

Fuel Conversion - Initial Clean-up by Activity (gal/year) - Mitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Area IV						
48 Trucks						
Off-road	472	diesel	10.15	46,465.53		
Haul	3,578	diesel	10.15	352,559.99		
Worker	64	gasoline	8.91	7,136.45	399,026	7,136
96 Trucks						
Off-road	472	diesel	10.15	46,465.53		
Haul	7,157	diesel	10.15	705,119.98		
Worker	63.59	gasoline	8.91	7,136.45	751,586	7,136
Liquid O_2						
48 Trucks						
Off-road	472	diesel	10.15	46,465.53		
Haul	687	diesel	10.15	67,643.90		
Worker	64	gasoline	8.91	7,136.45	114,109	7,136
96 Trucks						
Off-road	472	diesel	10.15	46,465.53		
Haul	1,373.17	diesel	10.15	135,287.81		
Worker	63.59	gasoline	8.91	7,136.45	181,753	7,136
Demo - Boeing						
48 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	0	gasoline	8.91	0.00	0	0
96 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	0	gasoline	8.91	0.00	0	0
Demo - DOE						
48 Trucks						
Off-road	326	diesel	10.15	32,165.09		
Haul	243	diesel	10.15	23,902.77		
Worker	146	gasoline	8.91	16,413.84	56,068	16,414
96 Trucks						
Off-road	326	diesel	10.15	32,165.09		
Haul	485	diesel	10.15	47,805.54		
Worker	146	gasoline	8.91	16,413.84	79,971	16,414
TTF - Boeing						
48 Trucks						
Off-road	381	diesel	10.15	37,547.38		
Haul	104	diesel	10.15	10,239.81		
Worker	51	gasoline	8.91	5,709.16	47,787	5,709
96 Trucks						
Off-road	381	diesel	10.15	37,547.38		
Haul	208	diesel	10.15	20,479.62		
Worker	51	gasoline	8.91	5,709.16	58,027	5,709

Santa Susana Field Laboratory

Fuel Conversion - Initial Clean-up by Activity (gal/year) - Mitigated

RMHF/HWMF - DOE						
48 Trucks						
Off-road	762	diesel	10.15	75,094.75		
Haul	390	diesel	10.15	38,386.70		
Worker	127	gasoline	8.91	14,272.90	113,481	14,273
96 Trucks						
Off-road	762	diesel	10.15	75,094.75		
Haul	779	diesel	10.15	76,773.39		
Worker	127	gasoline	8.91	14,272.90	151,868	14,273

Santa Susana Field Laboratory
Fuel Conversion - Mitigated

Construction Fuel Consumption Summary - Overall Cleanup

	gallons/year		Constructin Length
	Diesel	**Gas**	**Combined Total**
	Program - 80 truks per day		
Boeing	373,827	106,398	
DOE	319,182	35,509	
NASA	556,227	35,509	
M&M	0	79,778	
Total	***1,249,235***	***257,194***	***1,506,429***
	Program - 96 truks per day		
Boeing	537,601	106,398	
DOE	373,323	35,509	
NASA	657,777	35,509	
M&M	0	79,778	
Total	***1,568,700***	***257,194***	***1,825,895***
	Program - 48 trucks per day		
Boeing	259,075	106,398	
DOE	210,899	35,509	
NASA	353,126	35,509	
M&M	0	79,778	
Total	***823,100***	***257,194***	***1,080,295***
	Program - 80 truks per day		
Construction Equipment	183,898	0	
Haul Trucks	1,065,337	0	
Worker Commute	0	177,416	
M&M Commute	0	79,778	
	Program - 96 truks per day		
Construction Equipment	183,898	0	
Haul Trucks	1,278,404	0	
Worker Commute	0	177,416	
M&M Commute	0	79,778	

Santa Susana Field Laboratory

Fuel Conversion - Program - (gal/year) - Mitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Boeing						
48 Trucks						
Off-road	883	diesel	10.15	86,947.44		
Haul	1,747	diesel	10.15	172,127.70		
Worker	948	gasoline	8.91	106,397.69	259,075.14	106,397.69
DOE						
48 Trucks						
Off-road	492	diesel	10.15	48,475.39		
Haul	1,649	diesel	10.15	162,423.77		
Worker	316	gasoline	8.91	35,509.17	210,899.17	35,509.17
NASA						
48 Trucks						
Off-road	492	diesel	10.15	48,475.39		
Haul	3,092	diesel	10.15	304,650.72		
Worker	316	gasoline	8.91	35,509.17	353,126.11	35,509.17
Maintenance and Monitoring						
98 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	711	gasoline	8.91	79,778.25	0	79,778

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Fuel Conversion - Program - (gal/year) - Mitigated

	Total CO_2 MT/yr	Fuel Type	Factor $KGCO_2$/gal	Gallons	Total Diesel (gal)	Total Gas (gal)
Boeing						
80 Trucks						
Off-road	883	diesel	10.15	86,947.44		
Haul	2,912	diesel	10.15	286,879.50		
Worker	948	gasoline	8.91	106,397.69	373,827	106,398
DOE						
80 Trucks						
Off-road	492	diesel	10.15	48,475.39		
Haul	2,748	diesel	10.15	270,706.29		
Worker	316	gasoline	8.91	35,509.17	319,182	35,509
NASA						
80 Trucks						
Off-road	492	diesel	10.15	48,475.39		
Haul	5,154	diesel	10.15	507,751.20		
Worker	316	gasoline	8.91	35,509.17	556,227	35,509
Maintenance and Monitoring - Boeing						
80 Trucks						
Off-road	0	diesel	10.15	0.00		
Haul	0	diesel	10.15	0.00		
Worker	711	gasoline	8.91	79,778.25	0	79,778

APPENDIX E

Noise Calculations

OFF-SITE TRAFFIC NOISE LEVELS

Project Name: Santa Susana Field Laboratory EIR

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): Existing (2015) Traffic Noise Levels
Source of Traffic Volumes: KOA Corporation, Santa Susana Field Laboratory Transportation Feasibility Analysis, December 2016.
Community Noise Descriptor: L_{dn}: _____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

Analysis Condition Roadway Name Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
Future (2034) Without Project Traffic Conditions - Alternative 2													
Tapo Canyon Road													
B/t Royal Ave. & Los Angeles Ave.	No sensitive land uses	4	16	1,498	14,983	45	100	0	0	2.2%	0.8%	67.3	66.5
B/t Los Angeles Ave. & Cochran St.	SFR Residential	4	16	1,495	14,945	45	100	0	0	2.2%	0.8%	67.3	66.5
B/t Cochran St. & SR-118 FWY	No sensitive land uses	4	15	3,089	30,894	40	100	0	0	2.2%	0.8%	69.1	68.4

[1] Due to the varying distances of noise-sensitive uses to the roadway centerline, a reference distance of 100 feet is used for this analysis.

OFF-SITE TRAFFIC NOISE LEVELS

Project Name: Santa Susana Field Laboratory EIR

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): Future (2038) Without Project Traffic Noise Levels
Source of Traffic Volumes: KOA Corporation, Santa Susana Field Laboratory Transportation Feasibility Analysis, December 2016.
Community Noise Descriptor: L_{dn}: _____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

Analysis Condition Roadway Name Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
Future (2034) Without Project Traffic Conditions - Alternative 2													
Tapo Canyon Road													
B/t Royal Ave. & Los Angeles Ave.	No sensitive land uses	4	16	1,843	18,430	45	100	0	0	2.2%	0.8%	68.2	67.4
B/t Los Angeles Ave. & Cochran St.	SFR Residential	4	16	1,838	18,383	45	100	0	0	2.2%	0.8%	68.2	67.4
B/t Cochran St. & SR-118 FWY	No sensitive land uses	4	15	3,800	37,999	40	100	0	0	2.2%	0.8%	70.0	69.3

[1] Due to the varying distances of noise-sensitive uses to the roadway centerline, a reference distance of 100 feet is used for this analysis.

OFF-SITE TRAFFIC NOISE LEVELS

Project Name: Santa Susana Field Laboratory EIR

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): Future (2038) With Project Traffic Noise Levels
Source of Traffic Volumes: KOA Corporation, Santa Susana Field Laboratory Transportation Feasibility Analysis, December 2016.
Community Noise Descriptor: L_{dn}: _____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

Analysis Condition Roadway Name Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
Future (2034) Without Project Traffic Conditions - Alternative 2													
Tapo Canyon Road													
B/t Royal Ave. & Los Angeles Ave.	No sensitive land uses	4	16	1,903	18,910	45	100	0	0	2.2%	0.8%	68.3	67.5
B/t Los Angeles Ave. & Cochran St.	SFR Residential	4	16	1,898	18,863	45	100	0	0	2.2%	0.8%	68.3	67.5
B/t Cochran St. & SR-118 FWY	No sensitive land uses	4	15	3,860	38,479	40	100	0	0	2.2%	0.8%	70.1	69.3

[1] Due to the varying distances of noise-sensitive uses to the roadway centerline, a reference distance of 100 feet is used for this analysis.