DRAFT SUBSEQUENT ENVIRONMENTAL IMPACT REPORT FOR THE Recology Hay Road Landfill Land Use Permit Amendment No. 2

State Clearinghouse No. 2018032031



December 2019



PREPARED FOR: Solano County Department of Resource Management 675 Texas Street, Suite 5500 Fairfield, CA 94533 (707) 784-6765

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Prepared for:

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TABLE OF CONTENTS

Secti	on		Page
	LIST (OF ABBREVIATIONS	V
1	INTRO		
-	1.1	Type and Purpose of the EIR	
	1.2	Intended Use of the Environmental Impact Report	1-2
	1.3	Agency Roles and Responsibilities	1-2
	1.4	EIR Review Process	
	1.5	Scope of Environmental Analysis	1-4
	1.6	Organization of the EIR	1-5
2	EXEC	UTIVE SUMMARY	2-1
	2.1	Introduction	2-1
	2.2	Summary Description of the Proposed Project	2-1
	2.3	Summary of Environmental Impacts and Mitigation Measures	
	2.4	Summary of Alternatives	2-3
	2.5	Environmentally Superior Alternative	2-4
	2.6	Areas of Controversy	2-5
3	PROJ	3-1	
	3.1	Project Location	
	3.2	Project Background	3-1
	3.3	Previous CEQA Documentation	
	3.4	Project Objectives	
	3.5	Existing Permits	
	3.6	Existing RHR Landfill Operations	3-11
	3.7	Proposed Project	
	3.8	Operation and Maintenance	3-24
4	ENVI	RONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES	
	4.1	Aesthetics	4.1-1
	4.2	Air Quality	
	4.3	Archaeological, Historic, and Tribal Cultural Resources	
	4.4	Biological Resources	4.4-1
	4.5	Energy	
	4.6	Geology, Soils, Mineral, and Paleontological Resources	
	4.7	Greenhouse Gas Emissions	
	4.8	Hazards and Hazardous Materials	
	4.9	Hydrology and Water Quality	
	4.10	Noise	4.10-1
	4.11	Transportation	
5	CUM	ULATIVE IMPACTS	5-1
	5.1	Introduction to the Cumulative Analysis	5-1
	5.2	Related Projects	5-1
	5.3	Geographic Scope of the Cumulative Analysis	5-5
	5.4	Analysis of Cumulative Impacts	5-5

6	ALTERN	IATIVES	6-1
-	6.1	Alternatives to the Proposed Project	6-1
7	OTHER 7.1 7.2 7.3	CEQA-REQUIRED SECTIONS	7-1 7-1 7-1 .7-2
8	LIST OF	PREPARERS	8-1
9	REFERE	NCES	9-1
Appen	dices (included on CD)	
Append	A xib	Notice of Preparation documents (released March 2018; Re-released August 2018) and Comments on the NOP	S
Append	dix B	RHR Recyclable Material Bale Management Operations Plan (April 11, 2018)	
Append	dix C	Road Damage and Maintenance Agreement Between the County of Solano and Recology Hay Rc (July 25, 2016)	bad
Append	dix D	Air Quality Impact Assessment-Recology Hay Road Landfill (June 2019)	
Append	dix E	Supplemental Emissions Calculations for the Hay Road Landfill Project (November 2019)	
Append	dix F	Health Risk Calculations for the Hay Road Landfill Project (August 2019)	
Append	dix G	Traffic Impact Analysis (Kd Anderson)	
Append	dix H	Fuel Consumption Calculations	
Append	dix I	Wildlife Hazards Analysis (April 2018)	
Append	l xib	Noise Modeling Data	
Figure	es		
Figure 3	3-1	Regional Location	.3-2
Figure 3	3-2	Recology Hay Road Landfill Site Plan	.3-3
Figure 3	3-3	Existing Onsite Leachate Collection and Monitoring Facilities	. 3-7
Figure 3	3-4	Existing Leachate Tank and LFG Management System	.3-9
Figure 3	3-5	Landfill Haul Roads	3-12

Figure 3-6	Permitted Final Grading Plan	3-17
Figure 3-7	Proposed Final Grade	
Figuro 41-1	Photograph Viewpoints	/ 1_3
Figure 4.1-2	Photo Viewpoints A and B	4.1-4
Figure 4.1-3	Photo Viewpoints C and D	
Figure 4.1-4	Photo Viewpoint E	
Figure 4.4-1	Land Cover	4.4-5
Figure 4.4-2	Essential Connectivity Areas	4.4-16
Figure 4.4-3	Critical Habitat	4.4-17

Figure 4.6-1	Major Quaternary Faults and Historical Earthquake Events	4.6-7
Figure 4.9-1	Watershed	4.9-7
Figure 4.9-2	Flood Hazards	4.9-9
Figure 4.11-1	Existing Traffic Volumes and Lane Configurations	4.11-4
Figure 4.11-2	Project Volumes and Lane Configurations	4.11-13
Figure 4.11-3	Existing Plus Project Volumes and Lane Configurations	4.11-14
Figure 5-1	Cumulative Projects	5-4
Figure 5-2	2030 Traffic Volumes and Lane Configurations	5-14
Figure 5-3	Cumulative Plus Project Traffic Volumes and Lane Configurations	5-16
Figure 6-1	Alternative 2 Final Grading Plan	6-7
Tables Table 2-1	Summary of Impacts and Mitigation Measures	2-6
Table 4.2-1	Ambient Air Quality Standards	4.2-2
Table 4.2-2	Sources and Health Effects of Criteria Air Pollutants	4.2-9
Table 4.2-3	Summary of Construction-Related Emissions of Criteria Air Pollutants and Precursors	4.2-15
Table 4.2-4	Operational Mobile-Source Emissions of Criteria Air Pollutants and Precursors in 2020	4.2-16
Table 4.2-5	Operational Mobile-Source Emissions of Criteria Air Pollutants and Precursors in 2023	4.2-17
Table 4.4-1	Habitat Types within the Project Site	4.4-6
Table 4.4-2	Special-Status Plant Species Known to Occur in the Project Region and their Potential for Occurrence in the Project Site	4.4-7
Table 4.4-3	Special-Status Wildlife Species Known to Occur in the Project Region and their Potential for Occurrence in the Project Site	4.4-12
Table 4.4-4	Normal Blooming Period for Special-Status Plants with Potential to Occur Within the Triangle	4.4-19
Table 4.5-1	Construction Energy Consumption	4.5-6
Table 4.5-2	Net Change in Gasoline and Diesel Consumption	4.5-7
Table 4.6-1	Recorded Earthquakes Within 100 km (62 mi) of the RHR Landfill, Solano County, California	4.6-5
Table 4.7-1	Statewide GHG Emissions by Economic Sector	4.7-7
Table 4.7-2	Operational Greenhouse Gas Emissions	4.7-11

Table 4.10-1	Typical Noise Levels	4.10-2
Table 4.10-2	Human Response to Different Levels of Ground Noise and Vibration	4.10-4
Table 4.10-3	Ground-Borne Vibration (GBV) Impact Criteria for General Assessment	4.10-5
Table 4.10-4	Solano County Transportation Noise Standards	4.10-6
Table 4.10-5	Solano County Non-Transportation Noise Standards	4.10-6
Table 4.10-6	Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions	4.10-11
Table 4.11-1	Level of Service Definitions	4.11-5
Table 4.11-2	Roadway Segments LOS Definitions	4.11-6
Table 4.11-3	Existing Peak Hour Levels of Service at Intersections	4.11-7
Table 4.11-4	Existing Roadway Segment Levels of Service	4.11-8
Table 4.11-5	Historical Annual Tonnage 2016 – 2018	4.11-8
Table 4.11-6	Projected Daily Trips*	4.11-10
Table 4.11-7	Projected Peak Hour Trips	4.11-10
Table 4.11-8	Projected Saturday Daily Trips	4.11-11
Table 4.11-9	Trip Distribution	4.11-11
Table 4.11-10	Existing PLUS Peak Hour Levels of Service at Intersections	4.11-16
Table 4.11-11	Existing Plus Project Roadway Segment Levels of Service	4.11-17
Table 5-1	List of Projects in the Vicinity of the Proposed RHR Landfill Project	5-2
Table 5-2	Geographic Scope of Cumulative Impacts	5-5
Table 5-3	Summary of Modeled Traffic Noise Levels under Cumulative-No-Project and Cumulative Plus-Project Conditions	5-11
Table 5-4	Cumulative No Project Peak Hour Levels of Service at Intersections	5-12
Table 5-5	Cumulative No Project Roadway Segment Levels of Service	5-15
Table 5-6	Cumulative Plus Project Peak Hour Levels of Service at Intersections	5-17
Table 5-7	Cumulative Plus Project Roadway Segment Levels of Service	5-19
Table 6-1	Alternative 2 Compared to Proposed Project	6-5
Table 6-2	Comparison of the Environmental Impacts of the Alternatives in Relation to the Proposed Projec	t 6-16

LIST OF ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
µin/sec	micro inch per second
AB	Assembly Bill
ACW	Asbestos Containing Waste
AERMOD	Agency Regulatory Model Improvement Committee modeling system
AFB	Air Force Base
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
ALUC	Airport Land Use Commission
AOC	Area of Concern
APN	Assessor's parcel number
ASP	Aerated Static Piles
ATC	Authority to Construct
BAAQMD	Bay Area Air Quality Management District
BACT	Best Available Control Technologies
bgs	below ground surface
BSP	Bird Sanctuary Pond
BTU	British thermal unit
CAAQS	California ambient air quality standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Occupational Safety and Health Administration
CalARP	California Accidental Release Program
CalEEMod	California Emissions Estimator Model
CalRecycle	California's Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Standards Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH ₄	methane
CIWMB	California Integrated Waste Management Board
CMHP	Compostable Materials Handling Permit
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide

County	Solano County
CRPR	California Rare Plant Rank
CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
dB	decibels
dBA	A-weighted sound levels
diesel PM	exhaust from diesel engines
DM	disposal module
DTSC	California Department of Toxic Substances Control
ECS	Engineered Compost System
EDCAQMD	El Dorado County Air Quality Management District
EG	Emissions Guidelines
EGU	electric generating unit
EOP	Emergency Operation Plan
EPA	U.S. Environmental Protection Agency
ERC	Emission Reduction Credits
ERP/HMBP	Emergency Response Plan /Hazardous Materials Business Plan
ESA	federal Endangered Species Act
FHWA	Federal Highway Administration
GHG	greenhouse gas
HAP	hazardous air pollutant
HARP2	Hotspots Analysis Reporting Program, Version 2
HCM	Highway Capacity Manual, 2010 Edition
HCP	Habitat Conservation Plan
HDPE	high-density polyethylene
Hot Spots Act	Air Toxics Hot Spots Information and Assessment Act of 1987
HRA	health risk assessment
HRI	heat rate improvement
HTRW	Hazardous, Toxic, and Radioactive Waste
Hz	hertz
I-80	Interstate 80
in/sec	inches per second
IS/MND	Initial Study/Mitigated Negative Declaration
JPO	Jepson Prairie Organic
KDA	KD Anderson and Associates, Inc.
LandGEM	Landfill Generation Emissions Model
lb./day	pounds per day
LCFS	Low Carbon Fuel Standard
LCRS	Leachate collection and removal systems
L _{dn}	Day-Night Level

LEA	local enforcement agency
L _{eq}	Equivalent Continuous Sound Level
LF	landfill
LFG	landfill gas
L _{max}	Maximum Sound Level
LOS	level of service
I TU	land treatment unit
LUCP	Land Use Compatibility Plan
МАСТ	Maximum Achievable Control Technology
MBTA	Migratory Bird Treaty Act
MCE	maximum credible earthquake
MEI	Maximally Exposed Individual
million	MM
MMTCOre	million metric tons of CO_2 equivalents
mPa	minor metric tons of CO ₂ equivalents
MPO	metropolitan planning organization
	Menitering and Departing Program
	Monitoring and Reporting Program
MSHCP	Multispecies Habitat Conservation Plan
msl	mean sea level
MSL	mean sea level
MSW	municipal solid waste
MTCO ₂ e/year	metric tons of CO ₂ equivalent per year
MTP/SCS	Metropolitan Transportation Plan/Sustainable Communities Strategy 2035
N ₂ O	nitrous oxide
NAAQS	national ambient air quality standards
NCHRP	National Cooperative Highway Research Program
NFHRP	National Earthquake Hazards Reduction Program
NMOC	non-methane organic compounds
NO	nitrogen dioxide
	Notice of Proparation
	Notice of Freparation
NUV	Notice of Violation
NRCS	Natural Resources Conservation Service
NSPS	New Source Performance Standards
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Governor's Office of Planning and Research
OSHA	Occupational Safety and Health Administration
РСВ	polychlorinated biphenyl
PCF	perchloroethylene
PGA	peak around acceleration
DM.	respirable particulate matter with aerodynamic diameter of 10 micrometers or less
	fine particulate matter with acrodynamic diameter of 2.5 micrometers or loss
	ne particulate matter with aerodynamic diameter of 2.5 micrometers of less
	peak particle velocity
	PUDIC RESOURCES LODE
project site	KHK Landfill
PIO	Permits to Operate
RCP	Representative Concentration Pathway

RCRA	Resource Conservation and Recovery Act
RHR	Recology Hay Road
RMS	root-mean-square
ROG	reactive organic gases
ROR	Recology Ostrom Road
RWQCB	regional water quality control board
SACOG	Sacramento Area Council of Governments
SB	Senate Bill
SCS	sustainable communities strategy
SEIR	Subsequent Environmental Impact Report
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act
SO ₂	sulfur dioxide
SPL	sound pressure level
SR	State Route
SVAB	Sacramento Valley Air Basin
SWFP	Solid Waste Facilities Permit
SWRCB	State Water Resources Control Board
TAC	Toxic air contaminants
TCE	trichloroethylene
TCR	transportation concept report
TIA	Traffic Impact Analysis for Recology Hay Road Landfill Expansion Project
tons/year	tons per year
tpd	tons per day
TWW	treated wood waste
UATS	Urban Air Toxics Strategy
USACE	U.S. Army Corp of Engineers
USFWS	U.S. Fish and Wildlife Service
VC	vinyl chloride
VdB	vibration decibels
VMT	vehicle miles traveled
VOC	volatile organic compound
WDR	Waste Discharge Requirement
YSAQMD	Yolo Solano Air Quality Management District

1 INTRODUCTION

This Draft Subsequent Environmental Impact Report (Draft SEIR) evaluates the potential environmental impacts associated with implementation of proposed amendments (Amendment No. 2) to the Recology Hay Road (RHR) Landfill Land Use Permit (LUP), hereafter referred to as the proposed project. Solano County (County) is acting as the lead agency under the California Environmental Quality Act (CEQA) per Public Resources Code (PRC) (Sections 21000-21177) and the State CEQA Guidelines (California Code of Regulations [CCR], Title 14, Division 6, Chapter 3, Sections 15000-15387). The proposed project involves amendments to the existing LUP for the RHR landfill that would permit the following: lateral expansion of the existing municipal solid waste (MSW) disposal area within the RHR property boundary; a modification to the boundary of the Jepson Prairie Organics (JPO) facility; a correction to disposal footprint of existing Disposal Module-1; temporary storage of baled recyclable materials; a modification to landfill peak tonnage limits; authorization for construction and demolition (C&D) sorting operations; a change in location of friable asbestos disposal; modifications to the existing soil borrow pit; and the addition of an enclosed landfill gas flare.

1.1 TYPE AND PURPOSE OF THE EIR

Pursuant to Section 15162, an SEIR should be prepared if an EIR has been certified for a project, but one or more of the following conditions are met.

- Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
- A. The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
- B. Significant effects previously examined will be substantially more severe than shown in the previous EIR;
- C. Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
- D. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

RHR Landfill operations currently permitted by the existing LUP were previously evaluated pursuant to CEQA in two environmental impact reports prepared in 1993 and 2005 and three Initial Study/Mitigated Negative Declaration (IS/MND) prepared in 1995, 2001, and 2012. A summary of these documents are provided in Section 3.3, "Previous CEQA Documents," of this Draft SEIR. Due to the proposed amendments to the existing LUP and potential operational changes at the existing RHR Landfill, the County has determined that the preparation of a SEIR is the appropriate environmental review document for the project, per the requirements of State CEQA Guidelines Section 15162.

Per the State CEQA Guidelines, an SEIR need contain only the information necessary to make the previous EIR adequate for the project as revised (Guidelines Section 15162(d)). As discussed in Chapter 4 of this Draft SEIR, the proposed LUP amendments could result in potentially new significant impacts or an increase in the severity of previously identified significant impacts related to Aesthetics; Air Quality; Archaeological, Historical, and Tribal Cultural Resources; Biological Resources; Energy; Geology, Soils, Mineral, and Paleontological Resources; Greenhouse Gas Emissions; Hazards and Hazardous Materials; Hydrology and Water Quality; Noise; and Transportation. These issues are the focus of this SEIR.

1.2 INTENDED USE OF THE ENVIRONMENTAL IMPACT REPORT

An EIR is a public informational document used in the planning and decision-making process. The EIR assesses the environmental effects related to the planning, construction, and operation of a project and indicates ways to reduce or avoid significant environmental impacts. The EIR also discloses significant environmental impacts that cannot be avoided; any growth-inducing impacts of a project; effects found not to be significant; and significant cumulative impacts of past, present, and reasonably foreseeable future projects in combination with the impacts of the project.

Mitigation has been recommended where feasible to reduce or avoid the project's significant impacts. As an informational document for decision makers, a Draft SEIR is not intended to recommend either approval or denial of a project. CEQA requires the decision makers to balance the benefits of a project against its unavoidable environmental impacts. If environmental impacts are identified as significant and unavoidable (i.e., no feasible mitigation is available to reduce the impact to a less-than-significant level), the County Planning Commission may still approve the project if it believes that social, economic, or other benefits outweigh the unavoidable impacts. The County Planning Commission would then be required to make findings and state, in writing, the specific reasons for approving the project, based on information in the Draft SEIR and other information in the administrative record. In accordance with Section 15093 of the State CEQA Guidelines, the document containing such reasons is called a "statement of overriding considerations."

1.3 AGENCY ROLES AND RESPONSIBILITIES

This SEIR will be used by the County and CEQA responsible and trustee agencies to ensure that they have met their requirements under CEQA before deciding whether to approve the proposed project or, as a responsible agency, permit project elements over which they have jurisdiction. The SEIR may also be used by other federal, state, and local agencies that may have an interest in resources that could be affected by the project, or that have jurisdiction over portions of the project.

1.3.1 Lead Agency

Under CEQA, the lead agency is the public agency with principal responsibility for carrying out or approving a project. In accordance with CEQA Guidelines Section 15051, the CEQA lead agency for the proposed project is the County. The County has coordinated with responsible and trustee agencies as appropriate. As lead agency under CEQA, the County is principally responsible for conducting the environmental review process, including scoping, preparing appropriate environmental documentation, and obtaining required permits and other regulatory approvals. Following completion of the Final SEIR (Final SEIR), the County will decide whether to certify the Final SEIR and whether to approve the project.

1.3.2 Responsible and Trustee Agencies

Under CEQA, responsible agencies are state and local public agencies other than the lead agency that have the authority to carry out or approve a project, or that are required to approve a portion of the project for which a lead agency is preparing or has prepared an EIR. Trustee agencies are state agencies with legal jurisdiction over natural resources affected by a project that are held in trust for the people of the State of California.

The following agencies may have responsibility for or jurisdiction over implementation of elements of the project. The following list also identifies potential permits and other approval actions that may be required before implementation of certain project elements.

FEDERAL

U.S. Fish and Wildlife Service (Responsible Agency) – To comply with the Federal Endangered Species Act (ESA) for potential take of listed species.

STATE

- California Department of Resources Recycling and Recovery (CalRecycle) (Responsible Agency) To provide concurrence for amendment of the SWFP.
- Central Valley Regional Water Quality Control Board (Responsible Agency) To revise the landfill's Waste Discharge Requirements.
- California Department of Fish and Wildlife (Responsible and Trustee Agency) To comply with the California ESA for potential take of state listed species, and review the EIR as a trustee agency because the project could potentially affect biological resources.
- California Department of Transportation (Caltrans) -District 4—Identify appropriate fair share contribution towards improvements to operating conditions at specified intersections and roadway segments (see Section 4.11 of this Draft SEIR).

REGIONAL AND LOCAL

- Solano County Department of Resource Management (Responsible Agency) To issue a revised SWFP for the landfill as the local enforcement agency ("LEA") pursuant to the California Integrated Waste Management Act and revisions to the LUP for the RHR Landfill.
- Yolo-Solano Air Quality Management District and Bay Area Air Quality Management District (Responsible Agency) – To review and/or issue a revised or new authority to construct/permit and revised Title V Operating Permit to operate for the landfill.

1.4 EIR REVIEW PROCESS

1.4.1 Public Review

In accordance with PRC Section 21092 and CCR Section 15082, a Notice of Preparation (NOP) was prepared and circulated on March 12, 2018, for a 30-day period of public and agency comment. On August 31, 2018, a revised NOP was recirculated for a 30-day period of public and agency comment due to changes to some project components. The NOP's were submitted to the State Clearinghouse and the revised NOP was posted on the County's website (http://www.solanocounty.com/civicax/filebank/blobdload.aspx?blobid=28274). A copy of the NOP's and comments received on the NOP's are included in this document (Appendix A). Public scoping meetings were conducted by the County on March 27, 2018, and September 25, 2018, however, no written or oral comments were provided at these meetings.

This Draft SEIR is being circulated for a 45-day period of review and comment by the public and other interested parties, agencies, and organizations. A public hearing will be held on **January 16, 2020**, to receive input from agencies and the public on the Draft SEIR. Copies of the Draft SEIR are available online at the County's website at https://www.solanocounty.com/depts/rm/documents/eir/default.asp and a hard copy of the Draft SEIR is available for

public review at the Department of Resource Management, Solano County Government Center (675 Texas Street, Suite 5500, Fairfield, CA 94533) and the Dixon Public Library (230 N. 1st Street Dixon, CA 95620).

A public hearing on the Draft SEIR will be held to receive input from agencies and the public on the Draft SEIR. The meeting time and location are as follows:

Date: Thursday, January 16, 2020 Time: 7:00 p.m. Location: Board of Supervisors Chambers County Administration Center 675 Texas Street Fairfield, CA 94533

The 45-day public review period will begin on December 10, 2019 and conclude at 5:00 p.m. on January 23, 2020. All comments on the Draft SEIR should be addressed to:

Solano County Department of Resource Management Attn: Nedzlene Ferrario 675 Texas Street, Suite 5500 Fairfield, CA 94533 E-mail: NNFerrario@SolanoCounty.com

After close of the public comment period, responses to written and oral comments raising environmental issues will be prepared. Commenting responsible and trustee agencies will be provided a minimum of 10 days to review the proposed responses to their comments before any action is taken with respect to the proposed project. The Final SEIR (consisting of this Draft SEIR and the Response to Comments document) will then be considered for certification (in accordance with CCR Section 15090) and approval by the County Planning Commission.

1.4.2 CEQA Findings and Mitigation Monitoring

CEQA requires that when a public agency makes findings based on an EIR, the public agency must adopt a reporting or monitoring program for those measures it has adopted or made a condition of the project approval to mitigate or avoid significant adverse effects on the environment. The reporting or monitoring program must be designed to ensure compliance during project implementation.

The Mitigation Monitoring Program for the proposed project will be prepared and considered by the County Planning Commission in conjunction with the Final SEIR review.

1.5 SCOPE OF ENVIRONMENTAL ANALYSIS

Pursuant to CEQA and the State CEQA Guidelines, a lead agency shall focus the EIR's discussion on significant environmental effects and may limit discussion on other effects to brief explanations about why they are not significant (PRC Section 21002.1, CCR Section 15128). Potentially significant impacts were identified based on review of comments received as part of the public scoping process (see Appendix A) and additional research and analysis of relevant project data during preparation of this Draft SEIR.

The County has determined that the project has the potential to result in significant environmental impacts on the following resources, which are addressed in detail in this Draft SEIR:

- **Aesthetics**
- Air Quality ►
- Archaeological, Historical, and Tribal Cultural Resources
- **Biological Resources** ►
- Energy
- Geology, Soils, Mineral, and Paleontological Resources

Effects Found Not to be Significant 1.5.1

CEQA allows a lead agency to limit the detail of discussion of environmental effects that are not potentially significant (PRC Section 21100, CCR Sections 15126.2[a] and 15128). Based on a review of comments received as part of the public scoping process (Appendix A) as well as additional research and analysis of relevant project data during preparation of this Draft SEIR, it was determined, for reasons described below, that the project would not result in significant environmental impacts in the following areas. Accordingly, these resources are not addressed further in this Draft SEIR.

Agriculture and Forestry Resources

Public Services and Recreation

- Land Use and Planning ►
- Population, Employment, and Housing

This SEIR acknowledges and incorporates the previous analysis and adopted mitigation measures from previous CEQA documents (see Section 3.3 of this Draft SEIR). Previously adopted mitigation measures, which would mitigate potential impacts associated with the proposed project through continued implementation, are identified where appropriate.

ORGANIZATION OF THE EIR 1.6

This SEIR is organized into the following sections:

- Chapter 1, Introduction Provides an introduction and overview describing the intended use of the EIR and the environmental review and certification process.
- Chapter 2, Executive Summary Summarizes environmental impacts that would result from implementation of ► the proposed project, describes recommended mitigation measures, and indicates the level of significance of impacts after mitigation.
- Chapter 3, Project Description Describes the project, including the location of the existing landfill, background ► information, goals and objectives of the project, existing facilities, and proposed changes to the existing facilities.
- Chapter 4, Environmental Setting, Environmental Impacts, and Mitigation Measures Contains an analysis of the ► reasonably foreseeable and potentially significant adverse environmental impacts of the proposed project on the physical environment. Each subsection introduces and describes the existing regulatory and environmental setting for the resource issue, significance criteria, methodology used to evaluate impacts, issues not discussed further, a description of project impacts, and recommendations of appropriate mitigation measures for potentially significant impacts.
- Chapter 5, Cumulative Impacts Discusses the potential cumulative impacts that would result from ► implementation of the project together with other past, present and probable future projects including whether the project's incremental increase to an already significant impact is cumulatively considerable.

- Utilities and Service Systems

- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Transportation

- Chapter 6, Alternatives Describes a range of potentially feasible alternatives to the proposed project, their ability to avoid or lessen the significant impacts of the project, and their associated environmental effects.
- Chapter 7, Other CEQA-Required Sections Includes a discussion of potential growth-inducing impacts and unavoidable significant impacts that cannot be mitigated to less-than-significant levels.
- Chapter 8, List of Preparers Identifies the SEIR preparers and those consulted during its preparation.
- ► Chapter 9, References Lists the sources of information cited throughout this SEIR.
- Appendices Contain a number of reference items providing support and documentation of the analyses performed for this report.

2 EXECUTIVE SUMMARY

2.1 INTRODUCTION

This summary is provided in accordance with the CEQA, including CEQA Guidelines Section 15123 (Title 14, CCR.) As stated in CCR Section 15123(a), "an environmental impact report (EIR) shall contain a brief summary of the proposed actions and its consequences. The language of the summary should be as clear and simple as reasonably practical." As required by the CCR, this section includes: (1) a summary description of the proposed project; (2) a synopsis of environmental impacts and recommended mitigation measures; (3) identification of the alternatives evaluated and of the environmentally superior alternative; (4) a discussion of the areas of controversy associated with the project; and (5) issues to be resolved, including the choice among alternatives.

2.2 SUMMARY DESCRIPTION OF THE PROPOSED PROJECT

2.2.1 Background

The Recology Hay Road (RHR) Landfill has been operating at the site since 1964. Recology is an integrated resource recovery company that currently owns and operates RHR Landfill. Facilities at the project site associated with landfill operations include monitoring and control systems (e.g., groundwater, landfill gas, leachate), storm water retention ponds, flood control berms, groundwater dewatering facilities, materials handling and processing areas, various structures, access roads, and a borrow pit. The landfill provides solid waste disposal services for both municipal and commercial customers in the San Francisco Bay Area and the Sacramento Valley, but primarily serves San Francisco as well as Solano County (i.e., cities of Vacaville and Dixon and portions of the unincorporated County) (Recology n.d.). Under the current Land Use Permit (LUP) U-11-09/Solid Waste Facility Permit (SWFP) 48-AA-0002, the 256-acre permitted landfill has a maximum allowable height limit of 215 feet above mean sea level (msl), a maximum limit for disposal depth of 20 feet below msl, and a total disposal design capacity of 37 million cubic yards (Solano County 2013). In 2016, the RHR Landfill had an average daily throughput of 1,682 tons per day (tpd). In 2017, fires in Sonoma County, an emergency condition, resulted in the need to accept fire debris at local landfills, including the RHR Landfill. As a result, annual throughput at the RHR Landfill increased to 1,947 tpd in response to the emergency condition. As of May 2018, 24.9 million cubic yards of disposal capacity was available for solid waste disposal (Golder 2018).

Included on top of the 256-acre permitted landfill is the Jepson Prairie Organics (JPO) Compost Facility. The permitted footprint of JPO is 39 acres (CalRecycle 2018). JPO is permitted to process manure, orchard and vineyard prunings, crop residue, post-consumer food waste, and yard waste; however, no biosolids are permitted for composting. The maximum annual composting capacity of the JPO facility is 172,600 cubic yards (CalRecycle 2018). JPO currently utilizes two types of composting processes: windrow and Aerated Static Piles (ASP). The windrow process is used for the composting of green waste by piling organic matter or biodegradable waste in long rows. The ASP system is used to compost food and green waste, and employs covers, fans, and several biofilters within different composting zones. Before 2009, JPO utilized the AgBag© vessel reactor system but switched methods due to lower VOC emissions associated with the ECS system (i.e., a reduction of approximately 50%) (Sullivan 2011). Facilities associated with JPO operations include a 22-acre engineered composting pad; leachate collection ditches and sumps, two leachate ponds (Pond A and B), leachate storage tanks, and storm water controls, various structures, and access roads (CVRWQCB 2016).

2.2.2 Project Objectives

The following project objectives have been identified for the proposed project addressed in this Subsequent Environmental Impact Report (SEIR):

- ▶ increase the RHR Landfill's disposal capacity by approximately 8.8 million cubic yards;
- maximize daily tonnage to the RHR Landfill, while providing at least 15 years of estimated disposal capacity at the RHR Landfill;
- extend the estimated RHR Landfill life by at least 5 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- extend the ability of JPO to compost Solano County organics by at least 4 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- correct the permitted RHR Landfill boundary to reflect existing conditions at the site;
- ▶ allow the RHR Landfill more flexibility in how it balances high-volume and low-volume days;
- achieve higher solid waste diversion at RHR with better sorting of construction and demolition materials;
- ► account for changing market conditions for recyclable commodities while avoiding disposal;
- allow for the continued disposal of friable asbestos in Solano County past the filling and closure of the existing permitted monofill (DM-1), projected to be 2021; and
- ▶ provide adequate soil cover for the landfill and avoid the import of soil.

2.2.3 Project Overview

The project involves the amendments to the existing RHR Landfill LUP and other associated permits to allow for the following new/expanded landfill operations:

- A 24-acre lateral expansion of the landfill disposal area within existing landfill property to include an adjacent triangular area (Triangle). Currently, the Triangle is largely undeveloped open space with a private gravel road, a manmade drainage channel (drainage ditch), an aboveground stormwater pipeline, and infrastructure for groundwater monitoring and landfill gas and leachate management. Under the proposed project, this entire area would be included within the permitted landfill disposal area. The Triangle would result in an increase of approximately 8.8 million cubic yards to the landfill's disposal capacity with the landfill footprint extended to the south. Because the expansion area would provide additional disposal capacity, it would extend the landfill's overall life by at least 5 years. Because the JPO compost facility is within the permitted disposal footprint and will, in a later phase of the landfill, be decommissioned to allow for disposal of waste in this area, the proposed capacity increase associated with the lateral expansion of the landfill would also extend the potential life of JPO by at least 4 years.
- The permitted 39-acre JPO facility boundary would be reduced to approximately 38 acres. The 1-acre area to be removed from the JPO boundary is currently a setback area and would be operated under the RHR Landfill's SWFP instead of the JPO's Compostable Materials Handling Permit (CMHP).
- ► A LUP modification that acknowledges disposal module-1 (DM-1) extends 0.3-acre beyond its originally defined disposal footprint. The permitted disposal footprint would be adjusted to reconcile the newly understood disposal footprint.
- Temporary storage (i.e., maximum of six months) of baled, single-stream recyclables within the landfill footprint until processing capabilities are improved to meet the new requirements and/or new markets are developed to accept the material. Specifically, RHR is proposing four bale stockpiles near the existing administrative office of up to 3,680 bales total.

- Increase in the allowable tonnage received on a peak day to 3,400 tpd with a 7-day-average limit of 3,200 tpd of disposal. The inclusion of a peak tonnage and a 7-day-average limit would allow the facility to accept additional waste on peak days without having to divert haulers to other facilities while en-route.
- Installation and operation of a sorting, separation, and processing area for construction and demolition (C&D) materials. This would allow for greater recovery of recyclable materials and greater diversion of materials from landfill disposal. The footprint of the portable C&D sorting operation would be approximately 150 feet wide by 300 feet long and would include all equipment and stockpiled materials.
- ► As part of permit modifications and except for DM-2.1, friable asbestos disposal is proposed within all existing DMs. Currently, the landfill is permitted to receive up to 2,500 tons per month of friable asbestos with disposal of this material limited to DM-1. No modification of the monthly tonnage limit on friable asbestos disposal would occur; rather, the onsite location would change because DM-1 is expected to meet capacity and close by 2021.
- ► Deepening and widening the limits of the existing soil borrow pit to accommodate the increased need for soil associated with proposed landfill construction and operations. The existing borrow pit measures 80 acres with a current maximum excavation depth of 60 feet below ground surface (bgs). In anticipation of the need for approximately 3.6 million cubic yards of additional soil, up to a 6-acre increase in the existing footprint of the borrow pit and deepening of the borrow pit by an additional 68 feet bgs is proposed as part of the project.
- ► An additional enclosed landfill gas (LFG) flare would be installed adjacent to the existing flare to ensure a total capacity of 6,000 cfm at the landfill for safe and adequate control of LFG.

Refer to Chapter 3, "Project Description" for further information regarding each of the proposed amendments listed above.

2.3 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table 2-1, at the end of this chapter, summarizes the environmental impacts of the proposed project, the level of significance of the impact before mitigation, recommended mitigation measures for significant impacts, and the level of significance of the impact after the implementation of mitigation. Implementation of the project would result in a cumulatively considerable contributions to significant and unavoidable transportation impacts at the intersections of State Route (SR) 12/SR 113 and SR 113/Midway Road and along Midway Road, which are projected to operate at unacceptable levels under Cumulative No Project conditions.

2.4 SUMMARY OF ALTERNATIVES

This Draft SEIR evaluates three alternatives to the proposed project: Alternative 1: No Project, Alternative 2: Vertical Expansion Alternative, and Alternative 3: Recology Ostrom Road Expansion.

Under Alternative 1: Under the No Project Alternative, no amendments to the existing RHR Landfill LUP and other permits would be made. Current conditions would continue until the landfill reaches capacity and updates to the RHR Road and Litter Agreement would continue to be updated periodically based on road conditions. Once the site reaches capacity, the landfill would be closed in accordance with closure and monitoring procedures and groundwater and LFG would continue to be monitored. All structures unrelated to ongoing monitoring of the site would be removed.

Alternative 2: Vertical Expansion Alternative. Alternative 2 would involve an increase in the allowable height limit of the existing landfill as part of the amended LUP to the maximum feasible height (260 feet above ground surface) from a grading perspective (shown in Figure 6 1). A summary of the increased total disposal capacity and landfill life for Alternative 2 compared to the proposed project is shown in Table 6-1. This alternative would result in no lateral expansion of the landfill into the Triangle and no increase to existing tonnage limit of 2,400 tons per day (tpd). As a result, deepening and widening of the borrow pit and installation of an additional flare would not be required under

this alternative. However, improvements to existing C&D operations, as well as temporary storage of recyclable bales would occur under this alternative. While this alternative would result in an expansion in the overall solid waste disposal capacity of the landfill, the expansion would accommodate approximately 7,721,700 cy less than that of the proposed project. The smaller increase in disposal capacity under Alternative 2 would result in an estimated closure date extension of less than one year versus the five years that would likely occur under the proposed project.

Alternative 3: Under Alternative 3, expansion in disposal capacity would occur at the Recology Ostrom Road (ROR) Landfill instead of expanding disposal capacity at RHR Landfill. ROR is a Class II Landfill and the only other landfill owned and operated by Recology. Located in southern Yuba County (5900 Ostrom Rd, Wheatland, CA), the ROR Landfill is approximately 76 miles northeast of RHR Landfill and provides solid waste disposal services to both municipal and commercial customers in the northern Sacramento Valley including Yuba, Sutter, Butte, Nevada, and Colusa Counties. The facility has been in operation since 1995, and to date, approximately 70 acres out of a total landfill development of 225 acres has been constructed and approved for operation (CRWQCB 2018: 2). The facility's maximum permitted capacity is 43,467,231 cubic yards (CY) and maximum permitted throughput is 3,000 tons per day (CalRecycle 2007). With a remaining capacity of 24,395,000 tons as of June 2016, ROR Landfill is estimated to reach capacity by 2102 (CVRWQCB 2018:2). Expansion of an existing waste disposal facility would have fewer impacts than construction of a new site, and as discussed above, other offsite alternatives were determined to be infeasible. In order to meet long-term, regional solid waste disposal needs, the projected additional solid waste capacity necessary for RHR customers (i.e., 8.8 million cubic yards) would be provided at ROR Landfill for disposal instead of through the expansion of existing disposal capacity at RHR Landfill. Under this alternative, a similar lateral expansion of ROR Landfill would occur. Additionally, vehicles carrying solid waste coming from the Bay Area would travel an additional 152 miles per round trip to reach the ROR Landfill. Assuming that only transfer and packer trucks associated with the projected increase in vehicle trips under the proposed project would travel to the ROR Landfill instead of the RHR Landfill, up to 114 vehicles per day (refer to Table 4.11-6 of Section 4.11, 'Transportation') would travel the additional 152 miles, resulting in a net increase of 17,328 vehicle miles per day under this alternative, compared to the proposed project. However, no expansion of operations or potential increase in the number of vehicles travelling to and from the landfill per day would occur at the RHR Landfill under this alternative.

2.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6 suggests that an EIR should identify the "environmentally superior" alternative. "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives."

The No Project Alternative would avoid the localized significant environmental impact associated with the proposed project and the other "build" alternatives. However, if the project or a similar expansion of RHR Landfill is not undertaken, an alternative location for solid waste disposal in the region would be necessary. As noted above, the RHR Landfill represents one of the closer regional landfills to the Bay Area. An alternative solid waste disposal location would likely be farther away, and require longer haul truck trips, which would result in a greater overall impact on air quality, GHG emissions, and transportation within the region. In addition, the No Project Alternative would not meet the need for long-term solid waste disposal capacity in Solano County and elsewhere in the region, would not minimize the net fiscal effects on rate payers and taxpayers, and would not conserve resources while providing a reasonable level of solid waste disposal. Therefore, this alternative would not realize the basic objectives of the project.

With regard to the other alternatives considered in this SEIR, development of Alternative 2 (Vertical Expansion Alternative) would reduce all of the potentially significant impacts of the project, primarily through less land disturbance. Alternative 3 would reduce localized impacts at the RHR Landfill but would have potentially greater impacts associated with haul trucks travelling further for disposal purposes and similar localized impacts at ROR Landfill. With respect to Alternative 2, it would avoid the considerable contribution to significant and unavoidable cumulative intersection and roadway segment operational impacts in the vicinity of the RHR Landfill associated with the project. With the exception of aesthetics, Alternative 2 would reduce impacts associated with all other resource

areas compared to the proposed project. While Alternative 2 would involve an expansion of landfill capacity, consistent with the project objectives, it would not achieve the project objectives related to increased gross disposal capacity and extension of the landfill's life to the extent of the proposed project. Therefore, Alternative 2 would be environmentally superior within the near term but may result in greater long-term effects as a result of a lack of solid waste disposal options available to the Bay Area, similar to Alternative 3. Therefore, the environmental impact differences between the project and Alternative 2 are not substantial enough that one is clearly superior over the other. On balance, the environmentally superior alternative would be either the project or Alternative 2, depending on decisions weighing types of environmental benefits and adverse effects by Solano County.

2.6 AREAS OF CONTROVERSY

Section 15123 of the State CEQA Guidelines requires the summary section of a Draft SEIR to identify areas of controversy known to the Lead Agency, including issues raised by agencies and the public. The following provides a summary of issues raised through scoping and comments on the Notice of Preparation (NOP) that could be considered controversial. The comment letters received on the NOP's are included in Appendix A of this document.

- Odor
- Windblown litter
- ► Air Quality
- Water Quality
- ► Increase in truck trips to the landfill

Table 2-1 Summary of Impacts and Mitigation Measures

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
4.1 Aesthetics			
Impact 4.1-1: Temporary Changes in Visual Character Temporary changes in views would occur as a result of construction activities, primarily related to the presence and operation of heavy equipment associated with lateral expansion of the landfill within the Triangle. These activities would include excavation of a realigned drainage ditch segment, construction of a 10-foot high perimeter berm, and installation of a required base liner containment system. Foreground views of these construction activities would be available to motorists heading northbound on SR 113. These changes would be temporary, largely screened from outside views, and not out of character with the existing landfill operations onsite. Therefore, the temporary changes as a result of the proposed project would not substantially degrade views of the project site. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.1-2: Long-Term Adverse Changes in Visual Character Lateral expansion of the landfill into the Triangle area and modification of existing landfill operations near the landfill's existing administrative office (i.e. storage of baled recyclables and addition of a new flare at G2 facility) would result in changes to views of the project site. However, views of the landfill expansion and operation modifications would be consistent and blend in with existing views of landfill operations from Hay Road and immediately north, east, and west of the Triangle area. Further, design of the landfill expansion area would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope along the southern boundary of the Triangle to screen views of landfill operations from SR 113. Modifications to these views would be consistent with existing views of the landfill operations onsite and substantial adverse changes would not occur. With project implementation, the increase in truck trips and the expansion of the landfill into the Triangle area could result in an increase in the amount of windblown litter generated from the facility. Although existing litter removal is governed by the 2016 RHR Road and Litter Agreement, it does not factor in the proposed lateral expansion and increase in truck trips. Therefore, the impact is considered potentially significant.	PS	 Mitigation Measure 4.1-1: Litter Control The facility operator shall implement the following litter control mitigation measures to address the lateral landfill expansion area and/or the increase in landfill truck trips following implementation of the proposed project: Windblown Litter from the RHR Site: Portable litter control fences shall be installed directly downwind of the working face during site operations. Additional litter collection crews shall be deployed following high wind events to remove litter from the parcels adjacent to the landfill. The RHR facility operator shall work to establish site access agreements with the adjacent property owners prior to project implementation. The maximum size of the working face shall be limited to 200' x 75' or smaller. Use of portable fencing in the immediate vicinity of the landfills working face and downwind of the working face shall be used to contain litter. Fencing along the site boundary of the landfill expansion area shall be high enough to contain litter from migrating offsite. Prior to the start of landfill operations within the expansion area, RHR shall construct a permanent 25 ft. tall litter-control fence that extends along the entire length of the southerly site boundary of the landfill expansion area. 	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	= Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
		 Adequate staffing shall be onsite to remove litter immediately from the property boundary in the event of a sudden change in wind speed or direction. Similarly, additional litter collection crews shall be deployed following such high wind events to remove litter from parcels adjacent to the landfill. The permittee (RHR) shall establish site access agreements with the adjacent property owners within 90 days of issuance of the use permit. 	
		► Windblown Litter from RHR-Related Truck Trips:	
		 If waste is hauled by RHR or its contractors over the following roads, RHR shall check for and pick up litter, on a weekly basis, or more frequently, on the following roads: Vanden Road from Peabody Road to Canon Road, Canon Road from Vanden Road to North Gate Road, North Gate Road from Canon Road to McCrory Road, McCrory Road from North Gate Road to Meridian Road, Meridian Road from McCrory Road to Hay Road, Hay Road from Meridian Road to Lewis Road, Lewis Road from Midway Road to Fry Road, and Midway Road from I-80 to SR 113. 	
		 If Solano County personnel identify litter on roads used by RHR and its contractors, Solano County shall immediately notify RHR and request that it be removed. RHR shall respond and remove such litter within twenty-four (24) hours of receiving notification from Solano County. 	
		► Litter Control:	
		 The facility operator shall negotiate an agreement with Solano County regarding reimbursement for the cost of removing trash and materials dumped along the above mentioned County roads, should County employees be required to assist in the removal of trash associated with the expanded use of the landfill. 	
		 Litter control shall be the responsibility of the RHR compliance officer and shall be monitored by the Solano County Local Enforcement Agency (LEA) to ensure compliance with state minimum standards. A plan for litter control, by means of fencing, crews, adjustment of the size of working the face and use of soil cover, shall be detailed in the litter management plan. 	
		 On a weekly basis, or more frequently if needed, RHR shall check for and pick up litter along adjacent properties, and along Burke Lane 	

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
		south of Hay Road, Dally Road north and south of Hay Road, Box R Ranch Road, Binghampton Road between SR 113 and Pedrick Road, Main Prairie Road between SR 113 and Pedrick Road, Brown Road between SR 113 and Pedrick Road, Pedrick Road between Brown Road and Binghampton Road, and along the following major haul routes: Fry Road between Leisure Town Road and SR 113, Lewis Road between Fry Road and Hay Road, Hay Road between SR 113 and Meridian Road, and Meridian Road between McCrory Road and Fry Road. The site, offsite properties, and roads listed above shall be kept as litter free as possible depending upon weather conditions. The County shall not be charged for disposal of litter or trash picked up during these activities. Within 90 days of the issuance of the land use permit, RHR shall execute an agreement with Solano County regarding reimbursement to the County for the cost of removing trash and materials dumped along the above mentioned County roads, should County employees be required to assist in the removal of trash associated with use of the RHR landfill in the event that RHR does not remove the litter within 24 hours of receiving notification from Solano County.	
Impact 4.1-3: Potential to Substantially Damage or Change Views from Any Scenic Resources Within a Designated Scenic Corridor SR 113 is a County Scenic Roadway located adjacent to the eastern boundary of the RHR Property boundary and approximately 0.25 mile from the Triangle area. Foreground views of the expanded landfill into the Triangle area would be available to motorists on northbound SR 113. Foreground views of the Triangle from SR 113 may include new views of landfill operations (i.e., trucks and refuse) within this area of the site. However, views of the expanded landfill area would be consistent with and blend into existing views of landfill operations located immediately north, east, and west of the Triangle. Consistent with existing landfill design onsite, the landfill expansion area would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope to partially screen views of landfill operations from SR 113. At final grade, a rounded, rolling land formation is proposed to enhance the aesthetic appearance of the landfill modules. With implementation of the project, changes to views of the Triangle from SR 113 would be consistent with existing views of immediately adjacent landfill operations and design measures included in the project would partially screen views of the landfill expansion area from SR 113 motorists. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
Impact 4.1-4: Potential for Increased Light and Glare The existing landfill includes fixed and portable nighttime lighting, which would continue after implementation of the project. No new sources of fixed lighting are proposed. The project would include base liner preparation work during construction of the landfill expansion area that could result in the need for occasional and temporary portable nighttime lighting If the operator determines daytime temperatures are too high. Use of portable nighttime lighting under this circumstance is allowable under the landfill's light control program and would require downcast and shielded lighting to prevent offsite glare and confine lighting to the work area. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
4.2 Air Quality			
Impact 4.2-1: Construction-Related Emissions of Criteria Air Pollutants and Precursors Project construction would generate emissions of ROG, NO _X , PM ₁₀ , and PM _{2.5} . from grading, excavation, and installation of the geomembrane. Emissions would be generated by heavy-duty, off-road equipment and by worker commute trips and trucks hauling materials and equipment to the site. However, construction activities would not generate emissions of ROG, NO _X , and PM ₁₀ that would exceed YSAQMD- recommended mass emission thresholds. Therefore, construction-generated emissions of criteria air pollutants and precursors would not conflict with the air quality planning efforts in the region or contribute substantially to the nonattainment status of SVAB with respect to the NAAQS and CAAQS for ozone, the CAAQS for PM ₁₀ , or the NAAQS for PM _{2.5} . Thus, emissions generated during the project's construction would not contribute to air quality–related health complications experienced by people living in the SVAB. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.2-2: Long-Term Operational Emissions of Criteria Air Pollutants and Precursors The increase in project-related truck travel would generate levels of NO _X in the SFBAAB that exceed BAAQMD-recommended daily mass emission thresholds. Therefore, operational emissions could conflict with the air quality planning efforts in the SFBAAB or contribute substantially to the nonattainment status of SFBAAB with respect to the NAAQS and CAAQS for ozone and the project's operational emissions could contribute to air quality-related health complications experienced by people living in the SFBAAB. This would be a significant impact.	S	 Mitigation Measure 4.2-2: Ensure Truck-Generated Emissions of NOX in the San Francisco Bay Area Air Basin Will Not Exceed BAAQMD-recommended Mass Emission Criteria The applicant shall demonstrate compliance with one or a combination of the following mitigation options to ensure that the level of NO_X emissions in the SFBAAB associated with project-related truck trips does not exceed BAAQMD's recommended significance criteria of 54 lb/day and 10 tons/year. Within 60 days of use permit approval, the applicant shall submit to the Planning Services Division of the Department of Resource Management, a detailed action plan that demonstrates implementation of this measure. Option A. Achieve Early Compliance with the Truck and Bus Regulation., the applicant shall retrofit and/or upgrade its fleet of trucks to fully comply 	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
		with CARB's Truck and Bus Regulation prior to increasing average daily throughput at RHR landfill and before January 1, 2023, which is the date by which all trucks are required to comply with the emissions standards imposed by the Truck and Bus Regulation. The action plan submitted for this mitigation measure shall include an inventory of the vehicles to be retrofitted or upgraded and may include a phased approach. After January 1, 2023, Recology shall contract with haulers that are compliant and certified with CARB's Truck and Bus Regulations.	
		▶ Option B. Pay an Offset Fee to a Third-Party to Fund NO _X Emissions Offsets. The applicant shall purchase and retire NO _X offset credits sufficient to offset NO _X emissions in the SFBAAB at a rate of 57 lb/day and 10.3 tons/year from to a third-party non-profit (e.g., Bay Area Clean Air Foundation) or governmental entity prior to the receiving an increase in truck trips greater than the limits identified in Option B. The NO _X emission offset credits must be used to fund a NO _X reduction project in the SFBAAB. The cost of the credits, as well as any related administrative costs, shall be paid by the applicant. The applicant shall provide to the county the agreement that specifies the payment fee, timing of payment, and offset mechanism. This agreement must be signed by the applicant and the third-party entity. The specific emissions reduction project must result in emission reductions within the SFBAAB that are real, surplus, quantifiable, and enforceable and would not otherwise be achieved through compliance with existing regulatory requirements or any other legal requirement. The cost of implementing the selected measures shall be fully funded by the applicant. The NO _X project or program that would be implemented to offset NO _X must be approved by BAAQMD. The applicant shall provide proof to the county that the offsets are approved by BAAQMD and have been fully funded by the applicant. This option can only be implemented if NO _X offset credits are available at the time they are needed.	
		Option C: Use Renewable Diesel Fuel in All Diesel Trucks Operated by the Applicant. The applicant shall use only renewable diesel (RD) fuels in all diesel-powered trucks uses to haul materials to the landfill and the Construction and Demolition Sorting Operation. This measure applies to diesel trucks operated or contracted by the applicant. RD fuel must meet the following criteria:	

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
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		 meet California's Low Carbon Fuel Standards and be certified by CARB Executive Officer; be hydrogenation-derived (reaction with hydrogen at high temperatures) from 100 percent biomass material (i.e., non-petroleum sources), such as animal fats and vegetables; contain no fatty acids or functionalized fatty acid esters; and have a chemical structure that is identical to petroleum-based diesel and complies with American Society for Testing and Materials D975 requirements for diesel fuels to ensure compatibility with all existing diesel engines. The use of RD in trucks is estimated to reduce NO_X emissions by approximately 14 percent compared to conventional diesel fuel (SMAQMD 2015:3). 	
Impact 4.2-3: Exposure of Offsite Sensitive Receptors to Toxic Air Contaminants Emissions of TACs associated with implementation of the project, including diesel PM emitted by heavy construction equipment, TACs contained in LFG, and diesel PM generated by haul trucks traveling on area roadways, would not result in an incremental increase in cancer risk greater than 10 in one million or a hazard index of 1.0 or greater at any offsite sensitive receptors. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.2-4: Exposure of Sensitive Receptors to Odors The increase in municipal solid waste processed and landfilled at the project site as expansion occurs is not expected to result in additional sources or objectionable odors nor increased intensity of odors. Additionally, the area of landfill expansion is further away from the nearest offsite sensitive receptors than the portions of the landfill that are the currently being filled. Any odors associated with proposed storage of baled recyclables would be addressed with implementation of the nuisance and odor control measures described in the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018. Therefore, it is not anticipated that the project would result in odors adversely affecting a substantial number of people. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
4.3 Archaeological, Historic, and Tribal Cultural Resources	-		
Impact 4.3-1: Potential Impacts to Unique Archaeological Resources Results of the records search and pedestrian survey did not indicate any known archaeological sites within the project site. However, project-related ground- disturbing activities could result in discovery or damage of yet undiscovered	PS	Mitigation Measure 4.3-1: Halt Ground-Disturbing Activity Upon Discovery of Subsurface Archaeological Features In the event that any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
subsurface unique archaeological resources. This would be a potentially significant impact.		conceal cultural deposits, are discovered during construction, all ground- disturbing activity within 100 feet of the resources shall be halted and a professional archaeologist, qualified under the Secretary of the Interior's Professional Qualification Standards, shall be retained to assess the significance of the find. Specifically, the archaeologist shall determine whether the find qualifies as an historical resource, a unique archaeological resource, or a tribal cultural resource. If the find does fall within one of these three categories, the qualified archaeologist shall then make recommendations to Solano County regarding appropriate procedures that could be used to protect the integrity of the resource and to ensure that no additional resources are affected. Procedures could include but would not necessarily be limited to, preservation in place, archival research, subsurface testing, or contiguous block unit excavation and data recovery, with preservation in place being the preferred option if feasible. If the find is a tribal cultural resource, Solano County shall provide a reasonable opportunity for input from representatives of any tribe or tribes the professional archaeologist believes may be associated with the resource. Solano County shall implement such recommended measures if it determines that they are feasible in light of project design, logistics, and cost considerations.	
Impact 4.3-2: Impacts to Unknown Tribal Cultural Resources Consultation with the Yocha Dehe Wintun Nation has resulted in no resources identified within the project boundaries as tribal cultural resources per AB 52. However, it is possible that tribal cultural resources could be encountered during construction within the Triangle. Due to the potential for unknown resources within the Triangle that may be discovered through project construction activities, potential impacts to tribal cultural resources could be potentially significant.	PS	Mitigation Measure 4.3-2: Pre-Construction Cultural Sensitivity Training Prior to ground disturbance activities for the borrow pit and lateral expansion (Triangle), the project applicant shall provide evidence to Solano County to demonstrate compliance with Mitigation Measure 4.3-2. The project applicant shall arrange for a qualified archaeologist to conduct a cultural resources sensitivity training for all construction personnel who will be active on the project site during project-related construction activities. The training will be provided before the initiation of construction activities and will be developed and conducted in coordination with a representative from Yocha Dehe Wintun Nation. The training will include relevant information regarding sensitive cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations. The cultural sensitivity training will also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site and will outline what to do and whom to contact if any potential tribal cultural resources are discovered.	LTS

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Impact 4.3-3: Discovery of Human Remains Based on documentary research, no evidence suggests that any prehistoric or historic-era marked or un-marked human interments are present within or in the immediate vicinity of the project site. However, ground-disturbing construction activities could uncover previously unknown human remains. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097 would make this impact less than significant.	LTS	No mitigation measures are necessary.	LTS
4.4 Biological Resources			
Impact 4.4-1: Potential impacts to Special-Status Plants Project construction activities, including ground disturbance and vegetation removal, could result in disturbance to or loss of special-status plants if present on the project site. Because the loss of special-status plants could substantially affect the abundance, distribution, and viability of local and regional populations of these species, this would be a significant impact.	S	 Mitigation Measure 4.4-1a: Special-Status Plant Surveys Prior to commencement of ground disturbance within habitats in the Triangle where special-status plants may occur (i.e., grassland habitat, vernal pool habitat), and during the blooming period for the special-status plants with potential to occur on the sites (Table 4.4-4), a qualified botanist will conduct protocol-level surveys for the potentially occurring special-status plants that could be removed or disturbed by project activities. Protocol-level surveys will be conducted in accordance with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). If special-status plants are not found, the botanist will document the findings in a letter report to CDFW and further mitigation will not be required. [See pg 4.4-19 for Table 4.4-4, Normal Blooming Period for Special-Status Plants with Potential to Occur Within the Triangle] Mitigation Measure 4.4-1b: Special-Status Plant Avoidance If special-status plant species are found on the project site and are located outside of the permanent footprint of any proposed structures/site features and can be avoided, the project applicant will establish and maintain a protective buffer around special-status plants to be retained. Mitigation Measure 4.4-1c: Special-Status Plant Impact Minimization Measures If special-status plants are found during rare plant surveys and cannot be avoided, the project applicant will consult with CDFW and USFWS, as appropriate depending on species status, to determine the appropriate 	LTS
		Mitigation measures may include, but are not limited to, preserving and enhancing existing populations, creating offsite populations on mitigation sites through seed collection or transplantation at a 1:1 ratio, and restoring or creating suitable habitat in sufficient quantities to achieve no net loss of occupied habitat or individuals. Potential mitigation sites could include	

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		suitable locations within or outside of the campus. The project applicant will develop and implement a site-specific mitigation strategy describing how unavoidable losses of special-status plants will be compensated. Success criteria for preserved and compensatory populations will include:	
		The extent of occupied area and plant density (number of plants per unit area) in compensatory populations will be equal to or greater than the affected occupied habitat. Compensatory and preserved populations will be self-producing. Populations will be considered self-producing when:	
		 plants reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and 	
		 reestablished and preserved habitats contain an occupied area and flower density comparable to existing occupied habitat areas in similar habitat types in the project vicinity. 	
Impact 4.4-2: Potential impacts to Special-status Wildlife Construction activities, such as ground disturbance, grading, and vegetation removal could result in the disturbance to several special-status wildlife species, including California tiger salamander, giant garter snake, burrowing owl, California black rail, northern harrier, Swainson's hawk, tricolored blackbird, white-tailed kite, special- status branchiopods, and Delta green ground beetle. The loss of special-status wildlife species and their habitat would be a potentially significant impact.	PS	 Mitigation Measure 4.4-2a: California Tiger Salamander Avoidance and Compensatory Mitigation for Habitat Loss Prior to deepening and widening of the borrow pit and commencement of ground-disturbing activities within suitable habitat for California tiger salamander (i.e., grassland, vernal pools), the project applicant will implement the following measures to avoid direct loss of California tiger salamanders if present within the project site. A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat. A USFWS-approved biologist will conduct a pre-construction survey of the project site no more than two weeks before commencement of project construction activities. When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for California tiger salamander will be determined by a qualified biologist, approved by USFWS. All suitable burrows directly impacted by construction will be hand excavated under the supervision of a qualified wildlife biologist. If California tiger salamanders are found, the biologist will relocate the organism to the nearest burrow that is outside of the construction impact area. 	LTS

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		► For work conducted during the California tiger salamander migration season (November 1 to May 31), exclusionary fencing will be erected around the construction site during ground-disturbing activities after hand excavation of burrows has been completed. A qualified biologist will visit the site weekly to ensure that the fencing is in good working condition. Fencing material and design will be subject to the approval of the USFWS. If exclusionary fencing is not used, a qualified biological monitor will be onsite during all ground disturbance activities. Exclusion fencing will also be placed around all spoils and stockpiles.	
		► For work conducted during the California tiger salamander migration season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the biologist has confirmed that no California tiger salamander are in the work area.	
		Prior to beginning work each day, underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter will be inspected for California tiger salamander. If any are found, they will be allowed to move out of the construction area under their own accord.	
		Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than 1 foot will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.	
		 All food and food-related trash will be enclosed in sealed trash containers at the end of each workday and removed completely from the construction site once every three days to avoid attracting wildlife. 	
		 A speed limit of 15 mph will be maintained on dirt roads. 	
		 All equipment will be maintained such that there are no leaks of automotive fluids such as fuels, oils, and solvents. Any fuel or oil leaks will be cleaned up immediately and disposed of properly. 	
		 Plastic monofilament netting (erosion control matting) or similar material will not be used at the Project site because California tiger salamander may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. 	
		► Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 100 feet from	

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		aquatic habitat. If it is not feasible to store hazardous materials 100 feet from wetlands and the river channel, then spill containment measures will be implemented to prevent the possibility of accidental discharges to wetlands and waters.	
		 The applicant shall secure any necessary take authorization prior to project construction through formal consultation with USFWS pursuant to Section 7 of the ESA. 	
		Prior to commencement of ground-disturbing activities within suitable habitat for California tiger salamander in the Triangle (i.e., grassland and vernal pools within the landfill expansion area), the project applicant will implement the following measures to compensate for loss of California tiger salamander habitat.	
		 The project applicant will provide suitable in-kind habitat that will be created, restored, and/ or set aside in perpetuity at a ratio of 3:1. Alternatively, credits will be purchased at a USFWS-approved conservation bank. Compensation plans will be subject to review and approval by USFWS. All compensation will be acquired or secured prior to the beginning of ground disturbance. 	
		► In-kind habitat compensation will occur prior to initiation of ground or vegetation disturbance activities. Aquatic habitat will be provided for damage or loss of aquatic habitat and upland habitat will be provided for damage or loss of upland habitat. Compensation will be accomplished through the following options: 1) acquire land, by itself, or possibly in conjunction with a conservation organization, State park, State Wildlife Area, National Wildlife Refuge, or local regional park that provides occupied habitat; 2) purchase the appropriate credit units at a USFWS-approved conservation bank; 3) restore habitat to support the Central California tiger salamander; or 4) other method as determined by USFWS including participation within a HCP permit area.	
		Mitigation Measure 4.4-2b: Protection of Giant Garter Snake Prior to deepening and widening of the borrow pit and commencement of ground-disturbing activities within suitable aquatic (i.e., irrigation ditches) or upland habitat (i.e., grassland habitat) for giant garter snake in the Triangle, the project applicant will implement the following measures to avoid direct loss of giant garter snake if present within the project site.	

NI = No impact, LTS = Less than significant, PS = Potentially significant, S = Significant, and unavoidable For projects or ground-disturbing activities with potential to disturb suitable aquatic or adjacent upland habita for grian gater snake, the following measures will be implemented. The applicant shall retain a qualified biologist to conduct a field investigation to delineate giant gater snake, the following frequencies of the delineation of the project footprint. Gana gaters nake aquatic habita to right in tholders again that includes againclural ditches. A report summaring the results of the delineation shall be submitted to the Solano County Department of Resource Management within 10 days of the delineation. During construction, an approved biologist experienced with giant gatter snake identification and behavior shall be onsite daily when construction activities within quark habitat or griant diversity for grant gatter snake prior to construction activities. The biologist will also conduct environmental wareness training for all construction personnel working on the project site and success. The biologist mult agater snake prior to construction activities within gaint gater snake and the biologist and success. The biologist and success the delineation of a giant gater snake and the shall be conducted between May 1 and September 3 an active period for grant gatter snake. This would reduce direct impacts on the species because the snakes. This would reduce direct impacts on target snakes. This would reduce direct impacts on the species because the anakes. This would reduce direct impacts on the species because the anakes. This would reduce direct impacts on the species because the anakes. This would reduce direct impacts on the species because the anakes. This would reduce direct impacts on the species because thabitat is and tadpoles for to doeximit in dana dadpoles for to	Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
 For projects or ground-disturbing activities with potential to disturb subable aquatic or adjacent upbadh babtar for glant garter snake, the following measures will be implemented. The applicants hall retain a qualified biologist to conduct a field investigation to delinease quartic habitar within the project footprint and adjacent areas within 300 feet of the project footprint and adjacent areas within 300 feet of the project footprint. Garang garter snake aquatic habitar includes agricultural dirthes. A report summarizing the results of the delineation shall be submitted to the Solana County Department of Resource Management within 10 days of the delineation. During construction, an approved biologist experienced with giant garter snake identification and behavior shall be onsite daily when construction activities within aquatic habitat are taking place. The biologist shall inspect the project site daily for gant garter snake intervities within aquatic site and allo for gant garter snake intervities and activities and activation activities and protocols if a giant garter snake intervition activities and activation activities over an active construction activities over an active construction activities over an active construction active and respond to construction activities over and activa days and activate and respond to construction activities over in giant garter snake aquatic habitat (i.e., irringation diffects, the borrow pil. other habitat (i.e., irringation diffects, the porce snay to main activities over and the nermain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15	NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
 The applicant shall retain a qualified biologist to conduct a field investigation to define targing and the stake aquatic habitat within the project footprint. Giant garter snake aquatic habitat includes agricultural dirtches. A report summarizing the results of the defineation shall be submitted to the delineation. During construction, an approved biologist experienced with giant garter snake identification and behavior shall be submitted to the delineation. During construction, an approved biologist experienced with giant garter snake identification and behavior shall be construction activities within aquatic habitat or within 300 feet of aquatic habitat are taking palee. The biologist shall inspect the project site daily for giant garter snake identification activities outch activities. The biologist will also conduct environmental awareness training for all construction personnel working on the project site on required avoidance procedures and protocols if a giant garter snake enters an active construction zero. All construction activities to required avoidance procedures and protocols if a giant garter snake enters and active between May 1 and Septemer 15, the active period for giant garter snake aquatic habitat (e., irrigation dirtices, the borrow pit, other way. If construction activities occur in giant garter snake aquatic habitat (e., irrigation dirtices, the borrow pit, other habitat ident, field, the defineation of habitat, aquatic habitat is hall be dewatered and then remain dry and abaet of aquatic proy (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities exclusion them remain dry and abaet of aquatic remain dry and abaet of aquatic habitat habitat end then defineation of aduatic prevelses approximation and aduater to gainet garter snake approximation aduated between field buring the respect applicant shall consult with CDFW and USFWS to determine what a dationand measures may be necessary to minimize e			For projects or ground-disturbing activities with potential to disturb suitable aquatic or adjacent upland habitat for giant garter snake, the following measures will be implemented.	
 During construction, an approved biologist experienced with giant garter snake identification and behavior shall be onsite daily when construction activities within aquatic habitat or within 300 feet of aquatic habitat are taking place. The biologist shall inspect the project site daily for giant garter snake prior to construction activities. The biologist will also conduct environmental awareness training for all construction personnel working on the project site on required avoidance procedures and protocols if a giant garter snake enters an active construction zone. All construction activity within giant garter snake aquatic and upland habitat in and around the site shall be conducted between May 1 and September 15, the active period for giant garter snakes. This would reduce direct impacts on the species because the snakes would be active and respond to construction activities by moving out of the way. If construction activities occur in giant garter snake aquatic habitat (i.e., irrigation ditches, the borrow pit, other habitat identified during the delineation of habitat), aquatic habitat, complet dewatered and then remain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities. If complete dewatering is not possible, the project applicant shall consult with CDFW and USFWS to determine what additional measures may be necessary to minimize effects to giant garter snake. After aquatic habitat has been dewatered 15 days prior to construction activities, exclusion fencing shall be installed extending a minimum of 300 feet into adjicant upland habitat. Exclusionary fencing shall be installed extending a minimum of 300 feet into adjicant upland habitat. Exclusionary fencing shall be installed extending a minimum of 300 feet into adjicant upland habitat. 			The applicant shall retain a qualified biologist to conduct a field investigation to delineate giant garter snake aquatic habitat within the project footprint and adjacent areas within 300 feet of the project footprint. Giant garter snake aquatic habitat includes agricultural ditches. A report summarizing the results of the delineation shall be submitted to the Solano County Department of Resource Management within 10 days of the delineation.	
 All construction activity within giant garter snake aquatic and upland habitat in and around the site shall be conducted between May 1 and September 15, the active period for giant garter snakes. This would reduce direct impacts on the species because the snakes would be active and respond to construction activities by moving out of the way. If construction activities occur in giant garter snake aquatic habitat (i.e., irrigation ditches, the borrow pit, other habitat identified during the delineation of habitat), aquatic habitat, aquatic habitat, aquatic chabitat, squatic chabitat shall be dewatered and then remain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities. If complete dewatering is not possible, the project applicant shall consult with CDFW and USFWS to determine what additional measures may be necessary to minimize effects to giant garter snake. After aquatic habitat has been dewatered 15 days prior to construction activities, exclusion fencing shall be einstalled extending a minimum of 300 feet into adjacent uplands to isolate both the aquatic and adjacent upland habitat. Exclusionary fencing shall be erected 36 inches 			► During construction, an approved biologist experienced with giant garter snake identification and behavior shall be onsite daily when construction activities within aquatic habitat or within 300 feet of aquatic habitat are taking place. The biologist shall inspect the project site daily for giant garter snake prior to construction activities. The biologist will also conduct environmental awareness training for all construction personnel working on the project site on required avoidance procedures and protocols if a giant garter snake enters an active construction zone.	
 If construction activities occur in giant garter snake aquatic habitat (i.e., irrigation ditches, the borrow pit, other habitat identified during the delineation of habitat), aquatic habitat shall be dewatered and then remain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities. If complete dewatering is not possible, the project applicant shall consult with CDFW and USFWS to determine what additional measures may be necessary to minimize effects to giant garter snake. After aquatic habitat has been dewatered 15 days prior to construction activities, exclusion fencing shall be installed extending a minimum of 300 feet into adjacent uplands to isolate both the aquatic and adjacent upland habitat. Exclusionary fencing shall be erected 36 inches 			All construction activity within giant garter snake aquatic and upland habitat in and around the site shall be conducted between May 1 and September 15, the active period for giant garter snakes. This would reduce direct impacts on the species because the snakes would be active and respond to construction activities by moving out of the way.	
above ground and buried at least 6 inches below the ground to prevent			If construction activities occur in giant garter snake aquatic habitat (i.e., irrigation ditches, the borrow pit, other habitat identified during the delineation of habitat), aquatic habitat shall be dewatered and then remain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities. If complete dewatering is not possible, the project applicant shall consult with CDFW and USFWS to determine what additional measures may be necessary to minimize effects to giant garter snake. After aquatic habitat has been dewatered 15 days prior to construction activities, exclusion fencing shall be installed extending a minimum of 300 feet into adjacent uplands to isolate both the aquatic and adjacent upland habitat. Exclusionary fencing shall be erected 36 inches above ground and buried at least 6 inches below the ground to prevent	

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		area. In addition, high-visibility fencing shall be erected to identify the construction limits and to protect adjacent habitat from encroachment of personnel and equipment. Giant garter snake habitat outside construction fencing shall be avoided by all construction personnel. The fencing and the work area shall be inspected by the approved biologist to ensure that the fencing is intact and that no snakes have entered the work area before the start of each work day. The fencing shall be maintained by the contractor until completion of the project.	
		If a giant garter snake is observed, the biologist shall notify CDFW and USFWS immediately. Construction activities will be suspended in a 100-foot radius of the garter snake until the snake leaves the site on its own volition. If necessary, the biologist shall consult with CDFW and USFWS regarding appropriate procedures for relocation. If the animal is handled, a report shall be submitted, including date(s), location(s), habitat description, and any corrective measures taken to protect giant garter snake within 1 business day to CDFW and USFWS. The biologist shall report any take of listed species to USFWS immediately. Any worker who inadvertently injures or kills a giant garter snake or who finds one dead, injured, or entrapped must immediately report the incident to the approved biologist.	
		► All excavated steep-walled holes and trenches more than 6 inches deep shall be covered with plywood (or similar material) or provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each work day or 30 minutes prior to sunset, whichever occurs first. All steep-walled holes and trenches shall be inspected by the approved biologist each morning to ensure that no wildlife has become entrapped. All construction pipes, culverts, similar structures, construction equipment, and construction debris left overnight within giant garter snake modeled habitat shall be inspected for giant garter snake by the approved biologist prior to being moved.	
		 If erosion control is implemented on the project site, non-entangling erosion control material shall be used to reduce the potential for entrapment. Tightly woven fiber netting (mesh size less than 0.25 inch) or similar material will be used to ensure snakes are not trapped (no monofilament). Coconut coir matting and fiber rolls containing burlap are examples of acceptable erosion control materials. 	

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		The applicant shall ensure that there is no-net-loss of giant garter snake habitat by compensating for loss of habitat at a ratio of 1:1, by purchasing credits from a USFWS-approved conservation bank.	
		Prior to construction, USFWS shall be consulted pursuant to Section 7 of the ESA. The activities may qualify to use the "Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California" (USFWS 1999). The Habitat Replacement & Restoration Guidelines (Appendix A), Items Necessary for Formal Consultation (Appendix B), Avoidance & Minimization Measures During Construction (Appendix C), and Monitoring Requirements (Appendix D) shall be followed.	
		Mitigation Measure 4.4-2c: Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp Habitat Compensation for Direct Effects The project applicant shall implement the following measures to minimize and compensate for loss of vernal pool fairy shrimp and vernal pool tadpole shrimp and suitable habitat prior to ground-disturbing activities.	
		The following mitigation shall occur prior to ground-disturbing activities and approval of improvement plans for the lateral expansion and any project phase that would allow work within 250 feet of such habitat, and before any ground-disturbing activity within 250 feet of the habitat.	
		Habitat Preservation: The applicant, in consultation with USFWS, shall compensate for direct effects of the project on potential habitat for vernal pool fairy shrimp, conservancy fairy shrimp, and vernal pool tadpole shrimp at a ratio of 2:1, by purchasing vernal pool preservation credits from a USFWS-approved conservation bank. Compensation credits shall be purchased prior to any ground-disturbing activities.	
		Habitat Creation: The applicant shall compensate for the direct effects of the project on potential habitat for vernal pool fairy shrimp, conservancy fairy shrimp, and vernal pool tadpole shrimp at a ratio of 1:1, by purchasing vernal pool creation credits from a USFWS-approved conservation bank.	
		► For seasonal wetlands and drainages that shall be retained on the site (i.e., those not proposed to be filled), a minimum setback of at least 50 feet from these features will be avoided on the project site. The buffer area	

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		shall be fenced with high visibility construction fencing prior to commencement of ground-disturbing activities and shall be maintained for the duration of construction activities.	
		A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.	
		The applicant shall secure any necessary take authorization prior to project construction through consultation with USFWS pursuant to Section 7 of the ESA.	
		 Documentation of habitat preservation, habitat creation, and take authorization shall be provided to the County following approval by USFWS. 	
		Mitigation Measure 4.4-2d: Protection of Conservancy Fairy Shrimp Habitat From Indirect Effects	
		The project applicant shall implement the following measures to minimize indirect effects to Conservancy fairy shrimp habitat prior to any ground-disturbing activities within or adjacent to the playa pool on the project site.	
		During the dry season, when the playa pool is completely devoid of water, the project applicant shall construct a permanent, impermeable barrier along the southern boundary of the new disposal area within the Triangle that overlaps the playa pool. The barrier will be designed to prevent stormwater runoff or sediment discharge between the project site and the playa pool and will remain in place after construction to prevent operation-related discharge into the playa pool. The barrier shall be constructed of material that prevents discharge into the playa pool, including but not limited to: an earthen levee, steel sheet piles, or concrete riprap. Final design plans shall be reviewed and approved by a qualified biologist and the County.	
		 The project site will be graded in a manner that prevents surface water flow from the project site into the playa pool. 	
		A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.	
		Mitigation Measure 4.4-2e: Protection of Burrowing Owl Prior to ground disturbance, grading, or vegetation removal activities for the lateral expansion (Triangle), the project applicant will implement the following measures:	
Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
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		The applicant shall retain a qualified biologist to conduct focused breeding and nonbreeding season surveys for burrowing owls in areas of suitable habitat on and within 1,500 feet of the project site. Surveys shall be conducted prior to the start of construction activities and in accordance with Appendix D of CDFW's Staff Report on Burrowing Owl Mitigation (CDFW 2012).	
		 If no occupied burrows are found, a letter report documenting the survey methods and results shall be submitted to CDFW and no further mitigation will be required. 	
		If an active burrow is found during the nonbreeding season (September 1 through January 31), the applicant shall consult with CDFW regarding protection buffers to be established around the occupied burrow and maintained throughout construction. If occupied burrows are present that cannot be avoided or adequately protected with a no-disturbance buffer, a burrowing owl exclusion plan shall be developed, as described in Appendix E of CDFW's 2012 Staff Report. Burrowing owl shall not be excluded from occupied burrows until the project's burrowing owl exclusion plan is approved by CDFW. The exclusion plan shall include a plan for creation, maintenance, and monitoring of artificial burrows in suitable habitat proximate to the burrows to be destroyed, that provide substitute burrows for displaced owls.	
		► If an active burrow is found during the breeding season (February 1 through August 31), occupied burrows shall not be disturbed and will be provided with a 150- to 1,500-foot protective buffer unless a qualified biologist verifies through noninvasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. The size of the buffer shall depend on the time of year and level disturbance as outlined in the CDFW Staff Report (CDFW 2012). The size of the buffer may be reduced if a broad-scale, long-term, monitoring program acceptable to CDFW is implemented to ensure burrowing owls are not detrimentally affected. Once the fledglings are capable of independent survival, the owls can be evicted and the burrow can be destroyed per the terms of a CDFW-approved burrowing owl exclusion plan developed in accordance with Appendix E of CDFW's 2012 Staff Report.	

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		If active burrowing owl nests are found on the site and are destroyed by project implementation, the project applicant shall mitigate the loss of occupied habitat in accordance with guidance provided in the CDFW 2012 Staff Report, which states that permanent impacts to nesting, occupied and satellite burrows, and burrowing owl habitat shall be mitigated such that habitat acreage, number of burrows, and burrowing owls impacted are replaced through permanent conservation of comparable or better habitat with similar vegetation communities and burrowing mammals (e.g., ground squirrels) present to provide for nesting, foraging, wintering, and dispersal. The applicant shall retain a qualified biologist to develop a burrowing owl mitigation and management plan that incorporates the following goals and standards:	
		 Mitigation lands shall be selected based on comparison of the habitat lost to the compensatory habitat, including type and structure of habitat, disturbance levels, potential for conflicts with humans, pets, and other wildlife, density of burrowing owls, and relative importance of the habitat to the species range wide. If feasible, mitigation lands shall be provided adjacent or proximate to the cita so that displaced owls can relace to with reduced rick of take. Facilities 	
		of providing mitigation adjacent or proximate to the project site depends on availability of sufficient suitable habitat to support displaced owls that may be preserved in perpetuity.	
		 If suitable habitat is not available for conservation adjacent or proximate to the project site, mitigation lands shall be focused on consolidating and enlarging conservation areas outside of urban and planned growth areas and within foraging distance of other conservation lands. Mitigation may be accomplished through purchase of mitigation credits at a CDFW-approved mitigation bank, if available. If mitigation credits are not available from an approved bank and mitigation lands are not available adjacent to other conservation lands, alternative mitigation sites and acreage shall be determined in consultation with CDFW. 	
		 If mitigation is not available through an approved mitigation bank and will be completed through permittee-responsible conservation lands, the mitigation plan shall include mitigation objectives, site selection factors, site management roles and responsibilities, vegetation 	

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
		management goals, financial assurances and funding mechanisms, performance standards and success criteria, monitoring and reporting protocols, and adaptive management measures. Success shall be based on the number of adult burrowing owls and pairs using the site and if the numbers are maintained over time. Measures of success, as suggested in the 2012 Staff Report, shall include site tenacity, number of adult owls present and reproducing, colonization by burrowing owls from elsewhere, changes in distribution, and trends in stressors.	
		Mitigation Measure 4.4-2f: Special-status and Other Nesting Bird Surveys and	
		Avoidance Prior to any ground disturbances for the lateral expansion (Triangle), the applicant will implement the following measures to reduce impacts on special-status bird species:	
		To minimize the potential for disturbance or loss of tricolored blackbird, northern harrier, California black rail, or other bird nests, vegetation removal activities will only occur during the nonbreeding season (September 1-January 31). If all suitable nesting habitat (e.g., trees, grassland) is removed during the nonbreeding season, no further mitigation would be required.	
		► Prior to removal of any vegetation or any ground disturbance between February 1 and August 31, a qualified biologist will conduct preconstruction surveys for nests within 0.5 mile of the project site for Swainson's hawks, 500 feet for other nesting raptors, and 100 feet for all other birds. The surveys will be conducted no more than 30 days before construction commences.	
		 If no active nests are found during focused surveys, no further action under this measure will be required. 	
		If active nests are located during the preconstruction surveys, the biologist will notify CDFW. Impacts to nesting Swainson's hawks, other raptors, or other nesting birds shall be avoided by establishing appropriate buffers around active nest sites identified during preconstruction raptor surveys. Project activity shall not commence within the buffer areas until a qualified biologist has determined, in coordination with CDFW, that the young have fledged, the nest is no longer active, or reducing the buffer would not likely result in nest abandonment. CDFW guidelines recommend implementation of 0.5-mile-wide buffer for Swainson's hawk, 500 feet for	

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
		other raptors, and 100 feet for other nesting birds, but the size of the buffer may be adjusted if a qualified biologist and the project applicant, in consultation with CDFW, determine that such an adjustment would not be likely to adversely affect the nest. Monitoring of the nest by a qualified biologist during and after construction activities shall be required if the activity has potential to adversely affect the nest.	
		Mitigation Measure 4.4-2g: Swainson's Hawk Foraging Habitat Mitigation To mitigate for the loss of approximately 17 acres of suitable Swainson's hawk foraging habitat, the project applicant shall implement a Swainson's hawk mitigation plan consistent with the following but not limited to the requirements described below:	
		Prior to site disturbance associated with the landfill expansion, such as clearing or grubbing within the Triangle, building, or other site improvements, or recordation of a final map, whichever occurs first, the project applicant shall acquire suitable Swainson's hawk foraging habitat as determined by CDFW.	
		 The project applicant shall preserve through conservation easement(s) or fee title one acre of similar habitat for each acre affected or shall purchase credits from a CDFW-approved mitigation bank in Solano County at the same ratio. 	
		The project applicant may transfer said easement(s) or title to CDFW and a third-party conservation organization as acceptable to CDFW. Such third- party conservation organizations shall be characterized by non-profit 5019(c)(3) status with the Internal Revenue Service.	
Impact 4.4-3: Potential impacts to Wetlands, Vernal Pools, and Other Waters of the United States and State Potentially jurisdictional vernal pools, vernal pool swales, open water, detention basins, and drainage ditches are present within the project site. Future land use changes and development would result in conversion of these wetlands and vernal pools to urban uses. Loss or degradation of wetland or vernal pool habitat would be a potentially significant impact.	PS	 Mitigation Measure 4.4-3: Wetland Delineation Verification, Permitting, and Compensatory Mitigation Prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches) the project applicant will implement the following measures: Wetlands and vernal pools are of special concern to resource agencies and are afforded specific consideration, based on Section 404 of the CWA and other applicable regulations. An updated delineation of waters of the United States or state, including wetlands that would be affected by the project, was completed by ICF in 2017 (ICF 2017). This delineation shall be submitted to and verified by USACE. If, based on the verified delineation, it 	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	 Potentially sig 	nificant, S = Significant, SU = Significant and unavoidable is determined that fill of waters of the United States or state would result from implementation of the project, authorization for such fill shall be secured from USACE through the 404 permitting process.	
		Any waters of the United States that would be affected by project development shall be replaced or restored on a "no-net-loss" basis in accordance with USACE mitigation guidelines (or the applicable USACE guidelines in place at the time of construction). In association with the Section 404 permit (if applicable) and prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches), Section 401 Water Quality Certification from the RWQCB shall be obtained.	
		If it is determined that waters subject to jurisdiction by CDFW are present within the project site following the delineation of waters of the United States and state, and that site development would affect the bed, bank, or channel, a Streambed Alteration Notification will be submitted to CDFW, pursuant to Section 1600 et seq. of the California Fish and Game Code. If proposed activities are determined to be subject to CDFW jurisdiction, the project proponent will abide by the conditions of any executed agreement prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches). Several aquatic features onsite, including intermittent streams, would likely fall under the jurisdiction of CDFW.	
Impact 4.4-4: Impacts to Wildlife Migratory Corridors Future land use changes and development within the project site would result in loss of grassland and vernal pool habitats but would not substantially impede wildlife movement because the project site is relatively small, mostly developed, and is surrounded by roads and agricultural development. The project site does not contain any native wildlife nursery sites. Impacts to movement corridors and habitat connectivity for these species would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.4-5: Conflict with the Solano County General Plan Project implementation could result in impacts to natural resources and conversion of vernal pool habitat within an area identified as a high-priority habitat area in the Solano County General Plan, potentially resulting in a conflict with the Plan. This would be a potentially significant impact.	PS	Implement Mitigation Measures 4.4-1a, 4.4-1b, 4.4-1c, 4.4-2a, 4.4-2b, 4.4-2c, 4.4-2d, 4.4-2e, 4.4-2f, 4.4-2g, and 4.4-3 as described in this section.	LTS

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4.5 Energy			
Impact 4.5-1: Result in Inefficient and Wasteful Consumption of Energy The project would not increase electricity and natural gas consumption at the project site relative to existing conditions; no new structures requiring energy supplies would be required. However, construction and operation of the project would result in additional fuel consumption, associated with the use of construction equipment and vehicles travelling to and from the landfill. However, as part of the project and on an ongoing basis, Recology would use modern, more fuel-efficient equipment, and as part of the project, the increase in transfer trucks under the project reflects a consolidation and overall reduction in the number of potential vehicles travelling to and from the landfill. For these reasons, the project would not result in wasteful, inefficient, or unnecessary consumption of energy. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.5-2: Consistency with Plans for Renewable Energy and Energy Efficiency The project would be required to comply with federal and State energy standards regulations for reducing fuel consumption through construction and landfilling activities. Thus, this impact is less than significant.	LTS	No mitigation measures are necessary.	LTS
4.6 Geology, Soils, Mineral, and Paleontological Resources			
Impact 4.6-1: Exposure of People or Structures to Potential Increases in Seismic Hazards Project facilities would be constructed on a site that may be subject to strong seismic ground shaking from active earthquake faults and the site is located within an area of high shrink-swell potential area. Seismic ground shaking, though infrequent, could cause structural failure of proposed facilities. Because the project would be designed, engineered, and constructed in conformance with applicable codes and standard engineering practices, which consider the characteristics of materials and forces, and are designed to result in adequate strength and safety requirements, the potential for structural damage and associated hazards to people during a seismic event would be substantially reduced, and this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.6-2: Destruction of a Unique Paleontological Resource Portions of the Recology Hay Road (RHR) Property are underlain by older(Pleistocene) alluvium and the Tehama Formation, two geologic units known to be highly sensitive for paleontological resources. Thus, the project could have a potentially significant impact on paleontological resources.	PS	Mitigation Measure 4.6-1: Paleontological Resources Prior to initiation of earthmoving activities associated with the Triangle or deepening and widening of the borrow pit, Recology shall retain a qualified paleontologist to alert all construction personnel involved with earthmoving activities, including the site superintendent, about the possibility of encountering fossils. The appearance and types of fossils likely to be seen during construction will be described. Construction personnel will be trained about the proper notification procedures should fossils be encountered.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
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		If paleontological resources are discovered during earthmoving activities, the construction crew will be directed to immediately cease work in the vicinity of the find and notify the County. Recology will retain a qualified paleontologist that will be readily available for quick identification and salvage of fossils so that construction delays can be minimized. If large specimens are discovered, the paleontologist will have the authority to halt or divert grading and construction equipment while the finds are removed. The paleontologist will be responsible for implementing the following measures.	
		 In the event of discovery, salvage of unearthed fossil remains, typically involving simple excavation of the exposed specimen but possibly also plaster-jacketing of large and/or fragile specimens, or more elaborate quarry excavations of richly fossiliferous deposits 	
		 Recovery of stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including description of lithologies of fossil- bearing strata, measurement and description of the overall stratigraphic section, and photographic documentation of the geologic setting 	
		 Laboratory preparation (cleaning and repair) of collected fossil remains to a point of curation, generally involving removal of enclosing rock material, stabilization of fragile specimens (using glues and other hardeners), and repair of broken specimens 	
		 Cataloging and identification of prepared fossil remains, typically involving scientific identification of specimens, inventory of specimens, assignment of catalog numbers, and entry of data into an inventory database 	
		► Transferal, for storage, of cataloged fossil remains to an appropriate repository	
		 Preparation of a final report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the curated collection. 	
4.7 Greenhouse Gas Emissions			
Impact 4.7-1: Generation of Greenhouse Gas Emissions and Consistency with GHG Reduction Targets/Plan The project would result in increased GHG emissions contained in landfill gas and increased GHG emissions generated by truck hauling. All the GHG-emitting activities that would operate with the project are subject to regulations developed for the purpose of reducing GHG emissions and/or are consistent with GHG reduction	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
policies identified in CARB's 2017 Scoping Plan to help California meet its statewide GHG emission targets. Therefore, the project would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. Because the RHR Landfill is both infrastructure and an accessory land use that receives waste generated by residential and commercial land uses throughout the Bay Area and Sacramento Region, thereby supporting a large population and a large quantity of economic activity, its emissions of GHGs would not be substantial. For these reasons, project-related GHG emissions would not result in a cumulatively considerable contribution to climate change and this impact would be less than significant.			
4.8 Hazards and Hazardous Materials	L		
Impact 4.8-1: Exposure of People and the Environment to Hazardous Materials Operation of a landfill inherently involves the storage, use, and transport of hazardous materials; however, systems are in place at the RHR facility that are compliant with federal, state, and local laws to allow such handling in a way that is protective of people and the environment. No aspect of the proposed project would substantially change operations such that new or revised systems or procedures would be required. Hazardous materials would continue to be managed with existing controls in place and in accordance with all applicable laws, including Title 27 of the CCR, as it is currently. Implementation of the project would extend the disposal area laterally, deepen and widen an existing onsite borrow pit, allow for friable asbestos disposal within additional areas of the landfill, and allow for an increase in the existing daily peak tonnage limit. However, operations related to the storage, use, and transport of hazardous materials would remain the same as under existing conditions. Thus, the project would operate in accordance with all federal, state, and local regulations pertaining to the use, storage, and transport of hazardous materials. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.8-2: Exposure of People and the Environment to Hazards Related to LFG Expansion of the landfill could result in the production of additional LFG that could expose people or the environment to safety hazards. However, a third LFG flare is proposed as part of this project to ensure a total capacity of 6,000cubic feet per minute (cfm) at the landfill for safe and adequate control of LFG with landfill expansion. LFG would continue to be monitored at the project site and the LFG collection and the monitoring system would be expanded to accommodate the increased production of LFG. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
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Impact 4.8-3: Potential Hazards Associated with Vectors Vector control measures that are currently in place are effective and would continue to be implemented. In addition, there no proposed expansions of onsite water- related facilities; therefore, the proposed project would not increase the amount of standing water that could attract mosquitoes. Any vector control issues associated with proposed storage of baled recyclables would be addressed with implementation of the vector control measures described in the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.8-4: Potential Hazards Associated with Proximity to Airports The RHR Landfill is located approximately four miles northeast of the landfill and within the Travis AFB Land Use Compatibility Plan Zones C and B2. Potential safety hazards for aircraft using Travis AFB pertain to the landfill's potential to attract birds, which may increase wildlife strikes, and the use of lighting, which can be confused with landing zones by aircraft pilots. No new sources of fixed lighting are proposed and portable lighting to be used onsite would be consistent with the landfill's light control program and limited to base liner preparation work, as needed, during construction of the landfill expansion area and. The landfill maintains a bird control program and facility lighting standards, both of which minimize potential adverse hazards on aircraft. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.8-5: Increased Potential for Wildland Fires The project site is located in an area classified as a moderate fire hazard severity zone. However, extensive fire control measures are currently, and would continue to be, implemented at the project site to reduce the potential risk for fires. Thus, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
4.9 Hydrology and Water Quality	-	L	
Impact 4.9-1: Violation of Water Quality Standards or Waste Discharge Requirements Related to Construction Activities Project construction activities could result in soil erosion, sedimentation, and discharge of pollutants in nearby surface water bodies and groundwater, resulting in reduced water quality. The project applicant will control onsite stormwater and protect water quality through implementation of a SWPPP and associated BMPs, as required by federal and State regulations and the RHR Recyclable Material Bale Management Operations Plan approved by the County in April 2018. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
Impact 4.9-2: Violation of Water Quality Standards or Waste Discharge Requirements Related to Operation Project operation could result in soil erosion, sedimentation, and discharge of pollutants in nearby surface water bodies and groundwater, resulting in reduced water quality. The new disposal expansion area would be constructed to isolate any runoff and/or materials onsite, including a composite liner system to collect and remove leachate from the landfill, to prevent pollutant discharge to groundwater. This liner, as well as compliance with federal and State regulations regarding water quality, would ensure that this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.9-3: Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge With proposed expansion of the landfill, project implementation would require extended water use onsite related to dust control for the extended life of the landfill, and the current source of onsite water, the borrow pit, would be deepened and widened as part of the project. The project would not require groundwater supplies in excess of current demands. The change in the acreage of impervious surfaces would be negligible. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.9-4: Changes to Drainage Patterns or Stormwater Runoff That Would Create Flooding or Exceed the Capacity of Existing or Planned Storm Drains Project implementation would result in a negligible increase in impervious surfaces across the site. With implementation of the project, the RHR Landfill's existing surface water management system would be extended and expanded to include the landfill expansion area. As required by existing WDRs issued by the Central Valley RWQCB, the surface water management system would be designed to handle a minimum 100- year, 24 hour storm event such that any additional runoff generated onsite would be retained at the landfill property and no offsite flooding or potential capacity exceedances of existing or planned storm drains would occur. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
4.10 Noise			
Impact 4.10-1: Short-Term Construction Noise Project implementation would result in construction activity associated with the expansion of the existing landfill capacity. However, construction-generated noise levels would not exceed the applicable daytime or nighttime noise exposure standards established by the County for non-transportation noise sources at any sensitive receptors. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	= Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
Impact 4.10-2: On-Site Operational Noise Project implementation would result in the expansion of the existing landfill capacity as well as other modifications to the landfill. The expansion of the existing landfill capacity and other modifications would not result in changes in daily operations at the landfill and would not result in an increase in the number of facility employees. The project would also incorporate the processing of construction and demolition materials. Based on noise modeling conducted, noise levels generated by project-related operational activity would not increase and would not expose offsite receptors to noise levels that exceed applicable noise standards. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.10-3: Traffic-Related Noise Project implementation would result in an estimated 195 additional daily trips to the landfill facility. Project-generated traffic volume increases along affected roadways would result in an increase in traffic noise levels along these roadways. However, based on traffic noise modeling conducted for the project, traffic noise levels along affected roadways would not exceed the County's transportation noise standards at any noise-sensitive receptors. As a result, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
4.11 Transportation and Circulation	-		
Impact 4.11-1: Impacts to Intersection Operations Implementation of the project would add an estimated 46 AM peak hour, 27 PM peak hour, and 43 Saturday peak hour trips to the roadway network in the study area. Based on the traffic modeling and analysis, all study intersections would operate at acceptable LOS with the addition of project-generated trips. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.11-2: Impacts to Roadway Segment Operations Implementation of the project would add an estimated 46 AM peak hour and 27 PM peak hour trips to the roadway network in the study area. Based on the traffic modeling and analysis, all study roadway segments would operate at acceptable LOS with the addition of project-generated trips. This impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS
Impact 4.11-3: Impacts to Local Roadways Operation of the project could cause additional damage to local roadways within the vicinity of the landfill. Compliance with the Road and Litter Agreement between Recology and Solano County would ensure that any additional road damage caused by facility operations are paid for by RHR. Therefore, this impact would be less than significant.	LTS	No mitigation measures are necessary.	LTS

Impact	Significance before Mitigation	Mitigation Measure	Significance after Mitigation
NI = No impact, LTS = Less than significant, PS =	Potentially sig	nificant, S = Significant, SU = Significant and unavoidable	
Cumulative Impacts			
Cumulative Plus Project Intersection Operations	S	Mitigation Measure 5-1a: SR 113 and Midway Road Intersection Improvements This intersection is under the jurisdiction of Caltrans, and Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety. Within six months of project approval by the County, the project applicant and Solano County shall coordinate with Caltrans and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of the improvements detailed above. Mitigation Measure 5-1b: SR 12 and SR 113 Intersection Improvements Installation of a second eastbound lane through the roundabout will improve the LOS to an acceptable level in the PM peak hour. Within six months of project approval by the County, the project applicant and Solano County shall coordinate with Caltrans and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of a second eastbound lane through the roundabout applicant shall pay toward the condinate with Caltrans and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of a second eastbound lane through the roundabout.	SU
Cumulative Plus Project Roadway Segment Operations	S	Mitigation Measure 5-2: Midway Road (I-80 Eastbound Ramps to Porter Road) Roadway Segment Improvements A 0.30-mile-long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment LOS to an acceptable level. The project applicant shall coordinate with Solano County and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of the eastbound and westbound passing lanes along Midway Road between the I-80 eastbound ramps and Porter Road.	SU

3 PROJECT DESCRIPTION

This chapter presents a detailed description of the proposed amendments (Amendment No. 2 or project) to the Land Use Permit (LUP) for the existing Recology Hay Road (RHR) Landfill, which is operated by the applicant, RHR. The proposed project would include an expansion of the existing municipal solid waste (MSW) disposal area within the RHR property boundary; a modification to the boundary of the Jepson Prairie Organics (JPO) facility; a correction to disposal footprint of existing Disposal Module-1; temporary storage of baled recyclable materials; a modification to landfill peak tonnage limits; authorization for construction and demolition (C&D) sorting operations; a change in location of friable asbestos disposal; deepening and widening the existing soil borrow pit; and the addition of an enclosed landfill gas flare. This chapter describes RHR's objectives related to the project, existing and proposed facilities and operations, and the anticipated schedule for project construction and operation.

3.1 PROJECT LOCATION

The RHR Landfill (project site) is located on a 640-acre property (property) at 6426 Hay Road, immediately west of State Route (SR) 113 and south of Hay Road, in the unincorporated area of Solano County. The site is approximately 5 miles southeast of the City of Vacaville and 8 miles south of the City of Dixon (Figure 3-1). As shown in Figure 3-2, the 256-acre permitted landfill disposal footprint is located within the larger 640-acre property. The RHR Landfill consists of three parcels, which are County Assessor's parcel numbers (APNs) 042-020-060, 042-020-280, and 042-020-020. The site is located in Section 2, Township 5 North, Range 1 East on the U.S. Geological Survey Dozier 7.5-minute quadrangle.

The property is bound by Hay Road and irrigated row crop and pastureland uses to the north; irrigated pasture uses and Burke Ranch Conservation Preserve to the south and west; and SR 113 and irrigated row crop and pasture-land uses east of the project site. The nearest residential uses are located approximately 1 mile north of the project site.

3.2 PROJECT BACKGROUND

The landfill has been operating at the site since 1964, although it was initially known as the B&J Drop Box. RHR is an integrated resource recovery company that currently owns and operates the landfill. Facilities at the project site associated with landfill operations include monitoring and control systems (e.g., groundwater, landfill gas, leachate), storm water retention ponds, flood control berms, groundwater dewatering facilities, materials handling and processing areas, various structures, access roads, and a borrow pit (CVRWQCB 2016). The JPO composting facility is also located within the RHR property and serves San Francisco, surrounding Bay Area communities, and several municipalities within Solano County (Recology n.d.). The landfill provides solid waste disposal services for both municipal and commercial customers in the San Francisco Bay Area and the Sacramento Valley, but primarily serves San Francisco as well as Solano County (i.e., cities of Vacaville and Dixon and portions of the unincorporated County) (Recology n.d.). Under the current Land Use Permit U-11-09/Solid Waste Facility Permit 48-AA-0002, the landfill has a maximum allowable height limit of 215 feet above mean sea level (msl), a maximum limit for disposal depth of 20 feet below msl, and a total disposal design capacity of 37 million cubic yards (Solano County 2013). In 2016, the RHR Landfill had an average daily throughput of 1,682 tons per day (tpd). In 2017, fires in Sonoma County, an emergency condition, resulted in the need to accept fire debris at local landfills, including the RHR Landfill. As a result, annual throughput at the RHR Landfill increased to 1,947 tpd in response to the emergency condition. As of May 2018, 24.9 million cubic yards of disposal capacity was available for solid waste disposal (Golder 2018).





Included on top of the 256-acre permitted landfill is the JPO Compost Facility. The permitted footprint of JPO is 39 acres (CalRecycle 2018). JPO is permitted to process manure, orchard and vineyard prunings, crop residue, post-consumer food waste, and yard waste; however, no biosolids are permitted for composting. The maximum annual composting capacity of the JPO facility is 172,600 cubic yards (Solano County 2018). JPO currently utilizes two types of composting processes: windrow and Aerated Static Piles (ASP). The windrow process is used for the composting of green waste by piling organic matter or biodegradable waste in long rows. The ASP system is used to compost food and green waste, and employs covers, fans, and several biofilters within different composting zones. Before 2009, JPO utilized the AgBag© vessel reactor system but switched methods due to lower VOC emissions associated with the ECS system (i.e., a reduction of approximately 50%) (Sullivan 2011). Facilities associated with JPO operations include a 22-acre engineered composting pad; leachate collection ditches and sumps, two leachate ponds (Pond A and B), leachate storage tanks, and storm water controls, various structures, and access roads (CVRWQCB 2016).

Features within the property located outside of the permitted landfill disposal boundary include a borrow pit area (used for RHR Landfill operations); a Bird Sanctuary Pond (BSP) that collects some of the stormwater discharges from the landfill as well as groundwater pumped from the onsite borrow pit; areas of undeveloped land, including two specific areas which are currently being placed under a permanent conservation easement to preserve biological habitat values, which are identified as the Eastern and Western Conservation Areas in Figure 3-2. The Recology Vacaville-Solano fleet maintenance shop (Vacaville Shop) is located in the northwestern portion of the property.

3.3 PREVIOUS CEQA DOCUMENTATION

As disposal and diversion methods and needs have evolved since initial operation of the RHR Landfill, amendments to existing permits, including the currently proposed amendments to the landfill's LUP with the County, have necessitated environmental analysis pursuant to CEQA. RHR Landfill operations have been previously evaluated under CEQA in two environmental impact reports prepared in 1993 and 2005, one Initial Study/Negative Declaration (IS/ND) prepared in 2011, and three Initial Study/Mitigated Negative Declarations (IS/MNDs) prepared in 1995, 2001, and 2012. A summary of these documents are provided below. The setting discussion and summary of project impacts and mitigation measures included in the CEQA documents listed below are hereby incorporated by reference into this Subsequent Environmental Impact Report (SEIR), consistent with State CEQA Guidelines Section 15150. A compact disc (CD) of the documents incorporated into this SEIR will be made available to the public for inspection at the Solano County Government Center (675 Texas Street, Suite 5500, Fairfield, CA 94533) during the 45-day public review period of this Draft SEIR March 5, 2018 through April 18, 2018.

3.3.1 1993 EIR

In April 1993, the County certified the Final EIR (SCH# 92063112) for the B&J Landfill Master Development Plan (Brown and Caldwell 1992), in conjunction with Solano County's approval of Use Permit #U-91-28. The 1993 EIR included an evaluation of the following operational changes:

- 1. an overall expansion of landfill operations and development of the 640-acre project site,
- 2. a vertical expansion of the landfill to a maximum height of 150 feet above the natural ground surface (170 feet above msl),
- 3. a lateral expansion onto an adjacent 160-acre parcel,
- 4. creation of a soil borrow pit to provide soil for landfill cover,
- 5. relocation of the landfill entrance and new landfill entrance facilities,
- 6. and revised landfill operations,
- 7. increased landfill disposal capacity from 6.0 to 26.4 million cubic yards,
- 8. an increase in the average daily throughput to 780 tons per day (tpd), and

9. modification to the landfill gas and treatment system to control additional landfill gas generation from the operational changes.

3.3.2 1995 AND 2001 IS/MNDs

Following the 1993 EIR, two IS/MNDs, issued in September 1995 (SCH# 1995093048) and March 2001 (SCH# 2001032035), were prepared to evaluate further revisions to the LUP at the RHR Landfill and were subsequently adopted by Solano County. The 1995 MND evaluated the following operational changes:

- 1. the addition of a composting facility for green waste and food waste,
- 2. the receipt and drying of sewage sludge,
- 3. a household hazardous waste acceptance facility,
- 4. a change in the landfill classification from Class III to Class II to accept designated waste, and
- 5. an increase in the peak tonnage of waste accepted (up to 2,400 tpd with an average of 1,200 tpd).

The 2001 MND evaluated the following changes at RHR Landfill:

- 1. changes in the landfill design and operations,
- 2. a change in the hours of operation,
- 3. the use of alternative daily cover materials, and
- 4. an increase in the permitted amount of friable asbestos received at the site.

3.3.3 2005 SEIR

In March 2005, the County certified the Final SEIR (SCH#2004032138) for the NorCal Waste Systems, Inc. Hay Road Landfill Project (EDAW 2005), in conjunction with approval of further revisions to the use permit at that time. The 2005 SEIR included an evaluation of the following operational changes:

- 1. a landfill support facility, including a maintenance facility and corporation yard;
- 2. composting operation modifications;
- 3. addition of a recyclables loading area where both the public and collection vehicles deliver collected recyclables before transport to an offsite materials recovery facility;
- a revised landfill final cover design meeting existing Central Valley Regional Water Quality Control Board (CVRWQCB) Waste Discharge Requirements (WDRs) and increasing the final permitted landfill height by 50 feet to the current 215 feet above msl; and
- 5. revision and update of the 1995 Solano County Use Permit covering the landfill operations.

3.3.4 2011 IS/ND

In 2011, an IS/ND that evaluated the addition of a landfill-gas-to-energy facility at the RHR Landfill was adopted. The IS/ND evaluated the addition of a 7,500-square-foot facility with an internal combustion engine, adjacent to the existing landfill gas flare. The facility, upon completion, was estimated to provide up to 1.6 megawatts (MW) per year of renewable electricity supplies. Any excess landfill gas would be burned in the existing flare.

3.3.5 2012 IS/MND

Finally, in October 2012, an IS/MND (SCH#2004032138) that evaluated further revisions to the use permit at the RHR Landfill was adopted. The 2012 revisions included:

- 1. elimination of the landfill's average permitted tonnage limit;
- 2. the modification of the landfill's gas management system consistent with Yolo Solano Air Quality Management District (YSAQMD) Rule 3-4;
- 3. 12 additional onsite employees;
- 4. an upgrade of landfill equipment used in the disposal operations;
- 5. an increase in the landfill's active working face (i.e. the area where waste is deposited within the portion of the landfill actively being filled);
- 6. a reduction in the existing soil deficit at the site by using alternative daily cover (ex., C&D debris); and
- 7. implementation of odor management requirements.

3.4 PROJECT OBJECTIVES

The following project objectives have been identified for the proposed project addressed in this SEIR:

- ▶ increase the RHR Landfill's disposal capacity by approximately 8.8 million cubic yards;
- maximize daily tonnage to the RHR Landfill, while providing at least 15 years of estimated disposal capacity at the RHR Landfill;
- extend the estimated RHR Landfill life by at least 5 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- extend the ability of JPO to compost Solano County organics by at least 4 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- correct the permitted RHR Landfill boundary to reflect existing conditions at the site;
- ▶ allow the RHR Landfill more flexibility in how it balances high-volume and low-volume days;
- achieve higher solid waste diversion at RHR with better sorting of construction and demolition materials;
- ► account for changing market conditions for recyclable commodities while avoiding disposal;
- allow for the continued disposal of friable asbestos in Solano County past the filling and closure of the existing permitted monofill (DM-1), projected to be 2021; and
- To provide adequate soil cover for the landfill and avoid the import of soil.

3.5 EXISTING PERMITS

The existing landfill operates as four landfill (LF) units: LF-1, LF-2, LF-3, and LF-4, as shown on Figure 3-3. Each LF unit is built out in subunits, or disposal modules (DMs), which are shown on Figures 3-2, 3-3, and 3-4. LF-3 and LF-4 are operated as Class II landfills and LF-1 and LF-2 are operated as Class III landfills, as defined under CCR Title 27. The landfill also contains a Class II waste pile (WP-9.1). As a Class II and Class III waste management facility, the RHR Landfill currently operates in compliance with both the LUP U-11-09 Amendment No. 1 (October 18, 2012) and Solid Waste Facilities Permit (SWFP) #48-AA-0002 (July 9, 2013). The LUP provides conditional approval of existing land uses and operations within the entire 640-acre project site. The SWFP and LUP are issued by Solano County Department of Resource Management, with the concurrence of CalRecycle for issuance of the SWFP.











The JPO composting facility operates under the same LUP but has a Compostable Materials Handling Permit (No. 48-AA-0083) issued by CalRecycle (2018), separate from the RHR Landfill's SWFP.

Operation of facilities on the site are restricted by a number of permits, including WDR Order No. RD-2016-0056 and Dewatering Permit R5-2016-0076 issued by the CVRWQCB and several Yolo Solano Air Quality Management District permits, including Title V Permit #F-01059-15.

3.6 EXISTING RHR LANDFILL OPERATIONS

3.6.1 Permitted Waste Types and Volumes

The landfill currently accepts non-hazardous solid waste, high-liquid-content waste, wastewater treatment plant sludge, designated waste, asbestos-containing waste, and waste requiring special handling, as defined by the State. Disposal of asbestos-containing waste is currently limited to DM-1. In compliance with both the LUP and SWFP, the landfill is currently authorized to accept a maximum of 2,400 tpd of MSW for disposal and 2,500 tons of friable asbestos per month (CalRecycle 2013). The existing design capacity of the landfill is approximately 37 million cubic yards. As of May 2018, 24.9 million cubic yards of disposal capacity was available for solid waste disposal (Golder 2018).

In 2016, the landfill received a total of 603,636 tons of MSW. Within that period, the landfill received a 7-day average peak of 1,682 tpd of MSW and a monthly peak of 1,041 tons of friable asbestos. Under normal permit conditions, when MSW tonnage received by the landfill approaches the 2,400-tpd limit established within the SWFP and LUP, haulers are instructed to proceed to other disposal locations that have daily throughput capacity for that day.

The County complies with legislative mandates from the State of California requiring more diversion from landfills, which results in a higher demand for resource recovery, recycling, and composting. The JPO compost facility is permitted to accept an average of 600 tpd of compostable green material, agricultural material, and food wastes, with a peak daily total tonnage of 750 tpd. In 2016, JPO compost facility received an average of 275 tpd of compost feedstock, and in 2017, average daily tonnage of compost feedstock decreased to 201 tpd.

Under the current SWFP, the total average daily traffic permitted at the RHR Landfill is 620 vehicles per day, averaged over 7 days (CalRecycle 2013). In 2016, during a peak week, RHR Landfill received 483 vehicles per day averaged over 7 days. As noted above, in 2017, catastrophic fires in Sonoma County resulted in the need for the disposal of fire debris at local landfills in response to the emergency condition. As a result, the daily throughput of the RHR Landfill increased to 1,947 tpd (based on a 7-day average) and peak vehicle traffic in a single week was 695 vehicles. However, the fire debris, as it is considered part of the emergency response, was exempt from the conditions of the SWFP and LUP.

A map of designated haul routes for the RHR Landfill is provided in Figure 3-5.

3.6.2 Days and Hours of Operation

The RHR Landfill is currently permitted (through its existing SWFP) to operate seven days per week, 365 days per year, on a 24-hour basis. The landfill is open to commercial and contract haulers 24 hours per day and is open to the public from 8:00 a.m. to 4:00 p.m. The delivery of asbestos-containing waste and all designated wastes is limited to the hours of 7:00 a.m. to 4:00 p.m., Monday through Saturday.

3.6.3 Security

The facility is surrounded by a six-foot chain-link fence for security purposes with a taller litter control fence located along the perimeter of portions of the landfill (e.g., along the northern and eastern boundary of DM's 3, 4, 5, 6, and 7). When the RHR Landfill is closed to the public for the day, buildings onsite are secured.



3.6.4 Personnel

Approximately 35 full-time staff members are currently employed at the RHR Landfill, including management and administrative staff.

3.6.5 Leachate Monitoring, Collection, and Removal System

Leachate is liquid generated from moisture brought in with waste, from rainfall which percolates into the landfill, and from the waste decomposition process (CalRecycle 2003). Because this liquid includes dissolved and insoluble chemicals, leachate is collected and removed to prevent localized degradation of water quality. The existing liner system and leachate collection and removal system (LCRS) were previously approved by the CVRWQCB for DM-1A (unlined), 1B, 2.1A, & B, 2.2, 2.3, 3 through 6, 7.1, 7.2, 8 through 11, and 11.3 (CVRWQCB 2016: 3-4). As required by Title 27 of the CCR, Section 20340(b), the LCRS for the DM's listed above have been designed, constructed, maintained, and operated to handle twice the design flow. In other words, the leachate collection drains and sumps have been sized to collect and remove twice the maximum anticipated daily volume of leachate to prevent hydraulic head buildup on the landfill liner, beyond the sump, from exceeding 30 centimeters (approximately 1 foot) (CVRWQCB 2016: 10, 39). The LCRS is a minimum 6-inch-thick gravel drainage blanket and a system of 6-inch (minimum) perforated and non-perforated collection pipes spaced along the base of the DM's. The base of the DM's has been designed with a minimum cross slope of two percent to provide leachate drainage into the collection pipes. The collection pipes located in the low points of each fill module are designed with a minimum slope of one percent to convey leachate to collection sumps from which leachate can be removed (CVRWQCB 2016: 82).

The LCRS is monitored via the LCRS sump, from which monthly leachate samples are obtained and analyzed, in accordance with WDR requirements. The LCRS is designed to convey leachate to a sump where solar-powered pumps pump leachate to either onsite leachate tanks (as shown in Figure 3-4) or return it the composite-lined landfill unit from which it was generated. Collected landfill leachate may be hauled for use as dust control on lined portions of the landfill from where it originated or hauled offsite for disposal at a Publicly Owned Treatment Works.

3.6.6 Dust Controls

Activities in unpaved areas and earthmoving activities associated with landfill and JPO operations can create fugitive dust. Consistent with YSAQMD Rule 2.3 and the RHR Landfill's current Title V Permit (No. F-01059-15), fugitive dust is controlled through regular maintenance of haul and other onsite roads, timely placement of intermediate and final soil cover over the refuse fill, application of water or dust palliatives to work areas, excavation areas, and stockpile areas, and planting and maintenance of vegetative cover on completed fill slopes.

3.6.7 Odor Controls

Several potential sources of odor are generated from operations at the property, including aerobic decomposition of organic materials, anaerobic bacterial digestion of buried refuse, and composting. Onsite odors from aerobic decomposition of refuse are controlled by covering the refuse daily with a layer of clean soil, tarps, or other approved alternative cover. Anaerobic digestion of the buried waste produces carbon dioxide and methane, which are generally odorless, and trace amounts of volatile organic gases, which are odorous. As these natural gases are produced, internal pressures move the gases along paths of least resistance, including vertically through a soil cover. Soil cover is an effective filter for odor-causing fumes; however, cracks can develop in the fill surfaces that allow the gases and to control trace hazardous air pollutants, a landfill gas collection and control (enclosed flare) system has been installed at the landfill, as shown in Figure 3-4. In addition to these measures to control odors, the distance of the landfill from residential areas also reduces the potential for odors to affect sensitive receptors, the nearest of which is located approximately 1-mile north of the landfill's property boundary.

Odor complaints are currently handled by either the Solano County Resources Management Department or YSAQMD. The Solano County Resources Management Department maintains a log of all odor complaints received and whether the complaints were verified by County/YSAQMD staff.

3.6.8 Landfill Gas Management System

Decomposing waste within the landfill generates gaseous emissions referred to as landfill gas (LFG), which is primarily made up of methane and carbon dioxide. Because LFG contains pollutants that can affect air and water quality, which could result in hazards to human health and the environment, there are Federal, State, and local regulations in place that require operators of landfills of a certain size, including the RHR Landfill, to control and monitor LFG. To meet these regulatory requirements, RHR collects, controls, and monitors LFG.

The collection system includes extraction wells, collection and transport piping, an enclosed LFG flare, and an onsite LFG-to-energy plant that generates up to 1.6 megawatts of renewable electricity and approximately 12,900 megawatt hours per year. As part of a separately approved action at the landfill, an additional enclosed LFG flare will be installed adjacent to the existing flare in 2020. Both LFG flares are required to manage expected LFG generation rates and to ensure compliance with Recology's existing Waste Discharge Requirements and Title V permit.

Under the existing permitted limit, the landfill is expected to reach peak LFG generation by approximately 2030 at a maximum of 3,574 cubic feet per minute (cfm) of LFG at 50 percent methane. To adequately control LFG, the landfill requires the existing flare to operate with a capacity of 45 MM (million) BTU (British thermal unit)/hour (1500 cfm at 50 percent methane) as well as the installation and operation of a second flare with a capacity of 45 MM BTU/hour flare (another 1500 cfm at 50 percent methane). The LFG management system for the existing landfill footprint was approved under the landfill's 1993 EIR (Brown and Caldwell 1992: 2, 13).

LFG wells are drilled and installed into the waste and are constructed as the landfill builds out. To measure the potential for methane migration onto adjacent properties, monitoring probes have been constructed around the perimeter of the landfill at distances of no more than 1,000 feet apart (per Title 27, section 20919 et seq.), as shown in Figure 3-4. Per RHR's existing Monitoring and Reporting Program related to WDR Order No. R5-2016-0056, LFG probes are tested quarterly. The Yolo Solano Air Quality Management District and the U.S. EPA determine the appropriate monitoring and reporting protocols for LFG through the Title V permitting process for the landfill.

3.6.9 Stormwater Management

Storm water runoff from the landfill units drains by sheet flow or is directed to an unlined ditch along the facility perimeter that discharges via two outfalls to the onsite Bird Sanctuary Pond (BSP) where it is sampled before flowing offsite. Runoff from the JPO facility is captured and contained in two ponds within the composting area and storm water discharges from the BSP to the A-1 Channel are sampled under the Statewide Industrial Storm Water General Permit (CVRWQCB 2016: 19).

3.7 PROPOSED PROJECT

The proposed project consists of the following proposed amendments to the existing RHR Landfill LUP and permits:

- 1. Lateral Expansion of Landfill Capacity
- 2. Modification to Boundaries of JPO
- 3. Correction to Disposal Footprint of Disposal Module-1
- 4. Temporary Storage of Baled Recyclable Materials
- 5. Modification to Landfill Peak Tonnage Limit
- 6. Construction and Demolition (C&D) Sorting Operation

7. Addition of an Enclosed Landfill Gas Flare (LFG)

Each of the proposed amendments are explained in further detail below.

3.7.1 Lateral Expansion of Landfill Capacity

The landfill is built out in phases over its lifetime. As shown on Figure 3-3, much of the existing footprint of the landfill contains DM's that are currently used for waste disposal (marked as existing DM sites) and the central portion of the landfill will be used for waste disposal in the future (areas marked as future DM sites) and currently supports other ancillary uses, including JPO. The future DM's will likely be constructed within the next decade, depending on disposal needs. Each phase of landfill development (ex., laying of liner) occurs at least one year before the preceding area is filled with waste to make sure the landfill has continuous available capacity. Figure 3-6 shows what the currently permitted landfill would look like at final grade.

As part of the project, RHR proposes lateral expansion of the landfill disposal area that would occur within an approximately 24-acre triangular area (Triangle) to the south of the existing JPO compost facility (as shown on Figure 3-2). The Triangle includes an approximately 8-acre existing setback area (located within 7 acres of the permitted landfill boundary and 1 acre of the permitted JPO boundary) and approximately 16 acres of new disposal area, for a total of 24 acres. Currently, the Triangle is largely undeveloped open space with a private gravel road, a manmade drainage channel (drainage ditch), an aboveground stormwater pipeline, and infrastructure for groundwater monitoring and LFG and leachate management. Under the proposed project, this entire area would be included within the permitted landfill boundary for landfill disposal uses. The existing drainage ditch would be filled, and a new ditch would be constructed along the southern boundary of the Triangle, where it would connect to the landfill's existing perimeter ditches to both the east and west. The landfill's existing groundwater and LFG monitoring network, as well as its leachate collection system, would be modified to include the proposed expansion area and would be similar in design to the existing network and system.

The Triangle would result in an increase of approximately 8.8 million cubic yards to the landfill's disposal capacity with the landfill footprint extended to the south and extending the estimated closure date to 2038. The expansion area would be constructed over the summers of 2021 and 2022. Because the expansion area would provide additional disposal capacity, it would delay the construction of the remainder of the landfill, which would extend the landfill's overall life by at least 5 years. Because the JPO compost facility is within the permitted disposal footprint and will, in a later phase of the landfill, be decommissioned to allow for disposal of waste in this area, the proposed capacity increase associated with the lateral expansion of the landfill would also extend the potential life of the compost facility, by at least 4 years. Figure 3-7 shows what the landfill would look like at final grade with implementation of the project.

Of note, the Triangle was originally included as an area to be placed under easement, pursuant to a Nationwide Permit issued in 1993 by the U.S. Army Corps of Engineers (USACE). Working with USACE, RHR negotiated the purchase of mitigation credits (2.04 acres of vernal pool credits from Elsie Gridley Mitigation Bank) to remove the easement requirement from the Triangle. The purchase of the required credits was completed on June 23, 2016, and USACE confirmed on July 8, 2016 that the purchase effectively removed the easement requirement from the Triangle. No change to the existing permitted maximum disposal elevation of 215 feet above msl and maximum depth of 20 feet below msl is proposed as part of the project.

PREPARATION OF LATERAL EXPANSION AREA FOR DISPOSAL PURPOSES

To ensure that landfill refuse does not contaminate groundwater quality, preparations for the lateral expansion area would include installation of a required containment system to separate future refuse from groundwater. The expansion area containment system would integrate with the existing containment system in adjacent DM's and the liner would be consistent with current solid waste permitting requirements and other applicable requirements.

LANDFILL BERM CONSTRUCTION AND SLOPING OF LATERAL EXPANSION AREA

The lateral expansion area would also include a perimeter berm approximately 10 feet high and approximately 50 feet wide just north of the relocated vegetated ditch. An access road would be provided at the top of the perimeter berm. The purpose of the berm is to increase landfill slope stability and prevent inundation of the active disposal area during a 100-year, 24-hour storm.

As discussed above, the landfill's existing groundwater and LFG monitoring network, as well as its leachate collection system, would be modified to include the proposed area of lateral expansion (i.e., Triangle).

The top surface of the landfill would be sloped at a 5 percent minimum to provide drainage following differential settlement of the underlying refuse and would have a maximum height of 215 feet above the natural ground surface. Perimeter slopes would be 4:1 (horizontal: vertical) with benching every 50 vertical feet. The benches provide stability, intercept drainage, minimize erosion, and enable access around the landfill. Steeper slopes are allowed during the construction of the landfill. The final grading plan calls for a rounded, rolling land formation that will enhance the aesthetic appearance of the site.

OPERATIONS WITHIN LATERAL EXPANSION AREA

The proposed expansion area would be integrated into DM-8. Operations at DM-8, including the proposed expansion area, would include stormwater management, gas management, and leachate management systems that would be modeled after the systems in use at active Landfill modules onsite, and in accordance with the Central Valley Regional Water Quality Control Board's Waste Discharge Requirements for the RHR Landfill (WDR Order R5-2016-0056). The systems would manage stormwater, collect and combust (or other treatment of) gas, and contain leachate onsite, with offsite disposal of leachate to a permitted wastewater disposal facility as needed.

The proposed landfill expansion area would be used as a Class II disposal site, and the expansion would use the area fill method. In this method, the waste is spread and compacted on the ground surface, and cover material is spread and compacted over it. All vehicles would travel within the expansion area on proposed all-weather access roads to access the active unloading area.

With the additional acreage, the disposal capacity of the landfill would increase from 37 million cubic yards to 45.8 million cubic yards (i.e., an additional 8.8 million cubic yards) and would extend the estimated life of the landfill by at least 5 years. As mentioned above, the proposed capacity increase of the landfill would also extend the potential life of the compost facility by at least 4 years. As described above, no change to the existing permitted maximum disposal elevation of 215 feet above msl and maximum depth of 20 feet below msl is proposed as part of the project.

3.7.2 Modification to Boundaries of JPO Facility

The 39-acre JPO facility boundary would be reduced to approximately 38 acres. The 1-acre area to be removed from the JPO boundary is currently a setback area and would be operated under the RHR Landfill's SWFP instead of the JPO's CMHFP.

3.7.3 Correction to Disposal Footprint of Disposal Module-1

Recent test borings conducted at RHR Landfill show that DM-1, as delineated in Figure 3-3, extends beyond the geographic footprint originally identified for disposal of waste in the LUP and SWFP. Historical disposal of waste within DM-1 occurred in a 0.3-acre area near the northeast corner of DM-1 not captured by the existing disposal footprint (for location, see the red area identified in Figure 3-2). As part of the project, the LUP would be modified to acknowledge that DM-1 extends beyond its originally defined disposal footprint and the permitted disposal footprint would be adjusted to reconcile the newly understood disposal footprint.





3.7.4 Temporary Storage of Baled Recyclable Materials

Due to recent import restrictions imposed by China on recyclable materials, RHR proposes to temporarily store baled, single-stream recyclables within the landfill footprint until processing capabilities are improved to meet the new requirements and/or new markets are developed to accept the material. Specifically, RHR is proposing four bale stockpiles near the existing administrative office for temporary storage (i.e., maximum of six months) of up to 3,680 bales total. Each bale would be approximately 3 feet wide by 5 feet long by 3 feet high, and bale stockpiles would have a maximum allowable size of 40 feet wide by 105 feet long by 12 feet high. As shown in Figure 3-2, stockpiles are proposed within a paved area near the northern boundary of the JPO facility and one is proposed inside an existing recycling bunker located east of the scale house. Stockpiles would be located a minimum of 180 feet from edge of Hay Road. To minimize ground and storm water contact, bales would be stored on pallets and covered with tarps that would overlap a base tarp. The bales would be stored onsite for up to six months before being transported to offsite processing facilities.

Up to 20 trucks per day of baled recyclables could be delivered to the site for storage and each truck would contain approximately 50 bales. All trucks would enter and exit through the scales at the main entrance and proceed to one of the two bale storage areas for unloading and loading of bales via forklift.

Bales would be shipped on a first in/first out basis to limit the length of time that the bales are stored on site. A log would be maintained to track the dates and tonnage of incoming and outgoing loads and the records would be submitted to the LEA monthly. Requested extension of the storage time limit must be received in writing from the LEA. Proposed temporary storage of recyclable material bales at the RHR facility would be conducted in accordance with provisions in the CalRecycle Guidance Document related to *China's Import Restrictions and Guidance Regarding the Additional Storage of Recycled Material* (CalRecycle 2018).

A RHR Recyclable Material Bale Management Operations Plan was approved by the County in April 2018 and is provided in Appendix B of this Draft SEIR. The plan outlines the required procedures for receiving, storing, and shipping the baled recyclables at RHR, as summarized above. In addition, the plan requires implementation of certain best management practices (BMPs) related to stormwater control, vector prevention, nuisance and odor control, and fire hazard mitigation that must be implemented before and/or during storage of recyclable bales onsite. These BMPs are summarized below and would be implemented as part of the project. Implementation of these measures would be monitored at the site on a regular basis by the County Local Enforcement Agency (LEA).

STORMWATER CONTROL

Before storage of recyclable bales onsite, the Storm Water Pollution Prevention and Control Plan (SWPPP) for the facility would be updated to include the following stormwater control BMPs.

- The stacked bales will be stored on pallets over tarps to limit stormwater contact and control potential liquids from bales;
- Bales will be covered with tarps that overlap the base tarp;
- ▶ Regular facility cleaning, housekeeping, and litter control will be maintained;
- > First in and first out material handling process will be implemented; and
- ▶ Where necessary, berms or other structures will be placed to divert stormwater from the stored bales.

VECTOR PREVENTION

The following vector prevention control methods would be in place at the facility where recyclable bales are stored.

Bales will be tarped to limit flies and birds from accessing the materials;

- > Bales will be stored on pallets and over tarps to limit harboring of rodents and allow for easier cleaning if necessary;
- ► Regular facility cleaning, housekeeping, and litter control will be maintained;
- First in and first out material handling process will be implemented; and
- ▶ When observed, putrescible material will be removed.

NUISANCE AND ODOR CONTROL

In addition to Mitigation Monitoring and Reporting Program and Odor Impact Minimization Plan in place at the facility, the following measures would be implemented when baled recyclables are stored at the site:

- Bales will be tarped to limit moisture in the bales;
- ▶ Bales will be stored on pallets and tarps to allow for easier cleaning;
- ► First in and first out material handling process will be implemented;
- ▶ Regular facility cleaning, housekeeping, and litter control will be maintained;
- ▶ If offensive odors have the potential to impact offsite areas, odorous material and/or bales shall be removed;
- ▶ When observed, putrescible material will be removed.

FIRE HAZARD CONTROLS

When baled recyclables are stored at the site, the following fire hazard controls would be implemented:

- ► Maximum size of bale stockpiles shall not exceed the following dimensions:
 - Length: 105 feet
 - Width: 40 feet
 - Height: 12 feet;
- Minimum spacing between piles shall be 50 feet;
- Minimum spacing around perimeter of the piles shall be 25 feet;
- > Piles shall be visually inspected daily for potential fire hazards;
- > Piles temperature of piles will be monitored and logged once a week.

3.7.5 Modification to Landfill Peak Tonnage Limits

The project includes a revision of the existing daily tonnage limit for the RHR Landfill through the establishment of a new peak limit of tpd, as well as a new 7-day-average limit of tpd. The existing LUP allows for 2,400 tpd of landfill disposal. Occasionally, the landfill has received more than 2,400 tons of MSW; on a peak day in 2017, the landfill received 2,460 tons of MSW, requiring RHR to turn away trucks so as not to exceed the existing peak limit of the LUP. As part of the project, the LUP would be amended to allow for a peak day limit of 3,400 tpd with a 7-day-average limit of 3,200 tpd of disposal. The inclusion of a peak tonnage and a 7-day-average limit would allow the facility to accept additional waste on peak days without having to divert haulers to other facilities while en-route.

As with daily tonnage, the LUP and SWFP limit the amount of traffic to and from the landfill each day. The average daily traffic permitted at the RHR Landfill is 620 vehicles per day, averaged over 7 days. With the proposed increase in peak daily tonnage and additional truck trips associated with the temporary storage of recyclable material, peak daily vehicle trips could increase. Therefore, an increase in the facility's permitted average daily traffic volume is not proposed.

3.7.6 Construction and Demolition (C&D) Sorting Operation

The project includes a modification of existing onsite operations to include portable equipment to be used within the permitted landfill boundary for the sorting, separation, and processing of C&D materials. The RHR Landfill is currently permitted to receive C&D waste stream. However, the proposed LUP modification would authorize the sorting of this waste stream, which would allow for greater recovery of recyclable materials and greater diversion of materials from landfill disposal. Incoming C&D waste streams would be processed using portable equipment, primarily screens, sort lines, and a shredder, which could be moved around the site as the disposal area shifts within the landfill. The footprint of the portable C&D sorting operation would be approximately 150 feet wide by 300 feet long and would include all equipment and stockpiled materials.

3.7.7 Modify Disposal Modules Permitted to Receive Friable Asbestos

Currently, the landfill is permitted to receive up to 2,500 tons per month of friable asbestos (i.e. a heat-resistant fibrous silicate mineral that can be easily crushed, common examples are thermal insulation for water heaters and pipes, acoustic ceilings and tiles, and plasters). However, within the landfill property, disposal of this material is currently limited to DM-1, which is anticipated to reach its capacity and close in 2021. As part of permit modifications and except for DM-2.1, friable asbestos disposal is proposed within all existing DM's. No modification of the monthly tonnage limit on friable asbestos disposal would occur; rather, the onsite location would change.

3.7.8 Modifications to the Existing Soil Borrow Pit

As part of the proposed LUP modifications, the limits of the existing soil borrow pit would be deepened and widened to accommodate the increased need for soil associated with proposed landfill construction and operations. The existing borrow pit measures 80 acres with a current maximum excavation depth of 60 feet below ground surface (bgs). In anticipation of the need for approximately 3.6 million cubic yards of additional soil, up to a 6-acre increase in the existing footprint of the borrow pit and deepening of the borrow pit by an additional 68 feet bgs is proposed as part of the project. The proposed expansion of the borrow pit would not extend past an existing topsoil berm located adjacent to the Western Mitigation Area. The proposed increase in the area and depth of the landfill borrow site for excavation would provide the amount of soil necessary to provide cover for the landfill and avoid the need to import soil to the site.

3.7.9 Addition of an Enclosed Landfill Gas Flare (LFG)

As discussed above in Section 3.6.8, Landfill Gas Management System, one existing enclosed landfill gas flare (LFG) and a second LFG to be installed in 2020, one of which is operational and another that would become operational when the other flare reaches capacity. The second flare would be located adjacent to the existing flare at the onsite gas-to-energy plant. Together, the flares provide a total capacity of 4,000 cfm.

With the proposed landfill expansion and higher annual filling rate proposed under the LUP modification, the landfill is anticipated to produce a maximum of 4,651 cfm at 50 percent methane. Therefore, an additional enclosed LFG flare is proposed and would be located adjacent to the other flares. Similar to the other flares, the third flare would be 30 feet tall and would have a capacity of 45 MM BTU/hour (1500 cfm at 50 percent methane) to ensure a total capacity of 6,000 cfm at the landfill for safe and adequate control of LFG. Installation and operation of the proposed flare is anticipated to occur in approximately 2030, when the other flares are expected to reach capacity. Similar to the existing flare at the site, the proposed flare would be 30 feet tall.

3.7.10 Construction Activities and Schedule

The expansion area would be constructed over the summers of 2021 and 2022 and would include the following preliminary phasing plan:

- 1. A base liner containment system would be constructed in two subphases of approximately 10 acres each. Each base liner phase would be completed within one to two years, as needed to provide capacity for continual waste disposal operations. Each subphase would involve the placement of 230,000 cy of soil (compacted fill, compacted clay barrier, protective soil operations layer), two layers of 60 mil (or 1/1000 of an inch) High Density Polyethylene (HDPE) plastic geomembrane liner over a 20-acre area, and 8,000 cy of gravel for a leachate collection layer.
- 2. After the base liner containment system is installed, excavation for the realigned drainage ditch segment would occur using a long-arm excavator and the soil would be transported in a dump truck to the soil borrow pit to be used in landfill operations.

All components of the project are anticipated to become operational in 2022. Because the expansion area would provide additional disposal capacity, it would delay the construction of the remainder of the landfill, which would extend the landfill's overall life by at least 5 years. Because the JPO compost facility is within the permitted disposal footprint and will, in a later phase of the landfill, be decommissioned to allow for disposal of waste in this area, the proposed capacity increase associated with the lateral expansion of the landfill would also extend the potential life of the compost facility, by at least 4 years.

3.8 OPERATION AND MAINTENANCE

Upon completion of construction, the project site would be incorporated into the current daily operation and maintenance at the landfill. Existing landfill operations includes daily use of heavy equipment, including five bulldozers, two scrapers, two refuse compactors, four loaders, one motor grader, and two water trucks. As currently proposed, the project would maintain existing staffing. Disposal activities would continue within existing active DMs until they reach capacity, depending on spacing needs and operational requirements.

4 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

SCOPE OF ENVIRONMENTAL ANALYSIS

Pursuant to CEQA and the State CEQA Guidelines, a lead agency shall focus the environmental impact report's (EIR's) discussion on significant environmental effects and may limit discussion on other effects to brief explanations about why they are not significant (PRC Section 21002.1, CCR Section 15128). Potentially significant impacts were identified based on review of comments received as part of the public scoping process (see Appendix A) and additional research and analysis of relevant project data during preparation of this Draft Subsequent Environmental Impact Report (SEIR).

The County has determined that the project (i.e., modifications to the landfill's existing land use permit [LUP] and associated site modifications) has the potential to result in new and/or substantially more sever significant environmental impacts (pursuant to the State CEQA Guidelines [CCR Section 15162]) on the following resources, which are addressed in detail in this Draft SEIR:

- Aesthetics
- Air Quality
- Archaeological, Historical, and Tribal Cultural Resources
- Biological Resources
- Energy
- ► Geology, Soils, Mineral, and Paleontological Resources

- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- ► Hydrology and Water Quality
- Noise
- Transportation

No additional resources were identified as requiring further analysis during public review of the NOP for the SEIR.

Where appropriate, the Draft SEIR also discusses previous analyses and the previously adopted mitigation measures from the certified 1993 and 2005 EIRs conducted for the RHR Landfill (also referred to as landfill) and related to the County's LUP for the landfill. In certain instances, new mitigation measures are proposed to replace previously adopted and implemented mitigation, because of changes in applicable regulations (including CEQA) and standards of review.

TERMINOLOGY USED IN THE SEIR

This Draft SEIR uses the following terminology to describe environmental effects of the proposed project:

Less-Than-Significant Impact: A project impact is considered less than significant when it does not reach the standard of significance and would therefore cause no substantial change in the environment (no mitigation required).

Potentially Significant Impact: A potentially significant impact is an environmental effect that may cause a substantial adverse change in the environment; however, additional information is needed regarding the extent of the impact to make the determination of significance. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact.

Significant Impact: A project impact is considered significant if it results in a substantial adverse change in the physical conditions of the environment. Significant impacts are identified by the evaluation of project effects in the context of specified significance criteria. Mitigation measures and/or project alternatives are identified to reduce these effects to the environment where feasible.

Significant and Unavoidable Impact: A project impact is considered significant and unavoidable if it would result in a substantial adverse change in the environment that cannot be feasibly avoided or mitigated to a less-than-significant level if the project is implemented. If a lead agency proposes to approve a project with significant unavoidable impacts, it must adopt a statement of overriding considerations to explain its actions (CEQA Guidelines, Section 15093(b)).

Cumulative Impacts: According to CEQA, "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines, Section 15355). CEQA requires that cumulative impacts be discussed when the "project's incremental effect is cumulatively considerable... [or] ... provide a basis for concluding that the incremental effect is not cumulatively considerable (CEQA Guidelines, Section 15130 (a))."

Mitigation Measures: The CEQA Guidelines (Section 15370) define mitigation as:

- a) avoiding the impact altogether by not taking a certain action or parts of an action;
- b) minimizing impacts by limiting the degree of magnitude of the action and its implementation;
- c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- e) compensating for the impact by replacing or providing substitute resources or environments.

FORMAT OF THE ENVIRONMENTAL ANALYSIS

Each section begins with descriptions of the regulatory and environmental settings as they pertain to a particular issue. The environmental setting provides a point of reference for assessing the environmental impacts of the proposed project and alternatives (Chapter 6). The setting description in each section is followed by an impacts and mitigation discussion. The impacts and mitigation portion of each section includes impact statements, which are prefaced by a number in bold-faced type. An explanation of each impact and analysis of its significance follow each impact statement. All mitigation measures pertinent to each individual impact follow directly after the impact statement. The degree to which the identified mitigation measure(s) would reduce the impact is also described.

Regulatory Setting

This section of each chapter describes the federal, State, and local regulations that would apply to the proposed project and that could reduce or eliminate potentially significant impacts. This section also informs the reader of the applicable Solano County General Plan policies.

Environmental Setting

According to Section 15125 of the CEQA Guidelines, an EIR must include a description of the existing physical environmental conditions in the vicinity of the project to provide the "baseline condition" against which project-related impacts are compared. The baseline condition is typically the physical condition that exists when the Notice of Preparation (NOP) is published. The NOP for the proposed project was published on March 12, 2018, and recirculated on August 31, 2018. Therefore, this SEIR assesses the impacts of the proposed project in comparison to the uses existing at that time on the project site.

Environmental Impacts and Mitigation Measures

This section analyzes project-specific environmental impacts and recommends mitigation measures to reduce potentially significant or significant impacts. Information included in this section is described in more detail below.

SIGNIFICANCE CRITERIA

The CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant" (CEQA Guidelines Section 15382). Definitions of significance vary with the physical conditions affected and the setting in which the change occurs. The CEQA Guidelines set forth physical impacts that trigger the requirement to make "mandatory findings of significance" (CEQA Guidelines, Section 15065). For all environmental issues, this SEIR identifies specific standards of significance.

METHODOLOGY

This subsection identifies the methodology used to analyze potential environmental impacts.

ISSUES NOT DISCUSSED FURTHER

This section identifies any topic in the technical issue area that will not affected by the proposed project.

PROJECT IMPACTS AND MITIGATION MEASURES

The project impact and mitigation measure section analyzes the environmental impacts of the project. This subsection describes the potential environmental impacts of the proposed project and, based upon the thresholds of significance, concludes whether the environmental impacts would be considered significant, potentially significant, or less than significant. Each impact is summarized in an impact statement, followed by a more detailed discussion of the potential impacts and the significance of each impact before mitigation.

The impact number consists of the section of the EIR in which that impact is identified followed by a dash to indicate the number of the impact in that section. For example, Impact 4.1-1 is the first impact identified in Section 4.1.

The impact discussion includes a description of applicable regulations and concludes with a statement regarding whether the impact would be less than significant or significant before mitigation. If the impact is significant and mitigation is required, the finding of significance after mitigation is also identified.

The analysis of environmental impacts considers both the construction and operational phases associated with implementation of the proposed project. As required by Section 15126.2(a) of the CEQA Guidelines, direct, indirect, short-term, long-term, onsite, and/or offsite impacts are addressed, as appropriate, for the environmental issue area being analyzed. As described above under "Terminology," the Draft SEIR uses the following terms to describe the level of significance of impacts identified: less than significant, potentially significant, significant, and significant and unavoidable.

IMPACT ISSUE AREAS NOT WARRANTING DETAILED EVALUATION

CEQA requires that the discussion of any significant effect on the environment addresses substantial, or potentially substantial, adverse changes in the physical conditions that exist within the affected area. A lead agency is not required to provide a detailed discussion of the environmental effects that would not be significant, and may instead provide a brief statement of dismissal (CEQA Statues Section 21100, CEQA Guidelines Sections 15126.2[a] and 15128). Based on a review of the information presented in the NOP, previous CEQA documents approved for the landfill and comments received as part of the public review process (Appendix A), impacts associated with some resources would not result in new or substantially different environmental impacts compared to the previous 1993 EIR and 2005 SEIR. As described above, several sections within Chapter 4 of this Draft SEIR identify "Issues Not Discussed Further" that describe topics

within the technical issue area that will not be affected by the proposed project. Resources topics that are not included in Chapter 4 because they would not result in a significant impact to the environment are described below.

Agriculture and Forestry Resources

The RHR Property is located within unincorporated Solano County in an area zoned as A-80 and A-160 Exclusive Agricultural, meaning agricultural use with a minimum parcel size of 80 and 160 acres, respectively. The Solano County General Plan designates the permitted landfill boundaries and Triangle as Public/Quasi Public. Under these zoning and land use designations, landfill operations are conditionally permitted uses. The RHR Property is not used or zoned for timber harvest, and no forest land exists onsite. The 24-acre Triangle contains undeveloped annual grassland that was previously used for sheep grazing. The RHR Property is not classified as Important Farmland under the California Department of Conservation's Farmland Mapping and Monitoring Program; the permitted landfill area is classified as Urban and Built-Up Land and the remainder of the RHR property, including the Triangle, is classified as Grazing Land (California Department of Conservation 2016). The RHR Property is not enrolled in a Williamson Act contract.

Therefore, implementation of the project, including lateral expansion of the landfill disposal area within the Triangle, would not result in direct or indirect conversion of agricultural land to non-agricultural use or convert forestland to non-forest use. The project would not conflict with zoning for agricultural use or a Williamson Act contract. The project would have **no impact** on agriculture and forestry resources and these issues will not be discussed further in this Draft SEIR.

Land Use and Planning

The Solano County General Plan designates the permitted landfill boundaries and Triangle as Public/Quasi Public. This public use designation provides for airports, schools, solid waste facilities, hazardous waste facilities, and other public and quasi-public facilities. The portion of the RHR Property located south of the Triangle and landfill is designated as Agriculture with a Resource Conservation Overlay; no changes to this area are proposed. The RHR property is located within an area zoned as A-80 and A-160 Exclusive Agricultural, meaning agricultural use with a minimum parcel size of 80 and 160 acres, respectively, and agriculture is encouraged to the exclusion of other land uses that would conflict with agricultural development. Within this zone, refuse dumping, disposal, processing, and composting are conditionally permitted uses. Travis Air Force Base is located approximately four miles to the southwest. According to the Travis Air Force Base (AFB) Land Use Plan (LUP) (Solano County ALUP 2002: Figure 2A), a majority of the RHR Property falls within the Travis Air Force Base Land Use Plan Compatibility Zone C, with a small part of the northwestern portion of the Property falling within Zone B2. Compatibility Zone C encompasses locations exposed to potential noise in excess of approximately 60 decibel Community Noise Equivalent Level (dB CNEL) and occasionally affected by concentrated numbers of low-altitude (below 3,000 feet mean sea level) aircraft overflights. Zone B2, within which no project components are located, encompasses locations with a reduced accident potential based on crash patterns and potential noise levels in the 70-to-80 dB CNEL range.

The proposed project would not include any components that would physically divide an established community. Therefore, no impacts on established communities would be anticipated with project implementation. The site's existing Solid Waste Facility Permit (SWFP) and Land Use Permit (LUP) would be modified before implementation of the project and would not conflict with the land use or zoning designations for the site or a policy or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. As described in Section 4.8, Hazards and Hazardous Materials, the proposed project would not conflict with the Travis AFB Land Use Compatibility Plan. Therefore, the proposed project would have no adverse impacts on applicable land use plans, policies or regulations.

As described in Section 4.4, Biological Resources of this Draft SEIR, the project site is within Zone 3 (remainder of the County) of the Solano Multispecies Habitat Conservation Plan (MSHCP) area. However, projects within unincorporated Solano County are not subject to the MSHCP provisions. Additionally, while a final draft of the MSHCP and its EIS/EIR has been released, the MSHCP has not yet been adopted. Because the MSHCP is not an approved plan and unincorporated Solano County is not a participant in the plan, no conflicts with adopted plans would occur and there would be **no impact**.
Population, Employment, and Housing

A project is considered to be growth-inducing if it fosters economic or population growth, directly or indirectly, in the surrounding environment. These impacts could result from projects that include housing construction or the removal of an obstacle to growth, such as expansion of a wastewater treatment plant, extending transportation routes into previously undeveloped areas; and establishing major new employment opportunities. The proposed project would include an increase in the capacity of the RHR Landfill. Expansion of the landfill would not result in population growth through the provision of new homes, new businesses, additional employees, or in any other manner. In addition, all proposed facility modifications would be limited to the footprint of the RHR property and, thus, would not displace existing housing or people such that replacement housing would be required to be constructed elsewhere. Therefore, **no impacts** would occur and this technical issue area is not discussed further in this SEIR. The potential for growth-inducing effects of expanding the capacity of the landfill are discussed further in Chapter 7, under the subsection "Growth-Inducing Effects."

Public Services and Recreation

As discussed above, the proposed project does not include new housing or other project elements that would increase the permanent resident population in the project area. Increasing the capacity of the existing landfill and other elements of the project would have no effect on population growth. There could be a slight increase in the demand for police, fire, emergency services related to extending the life of the landfill; however, this increase would be minimal and would be covered by the existing police and fire facilities. There would be no increased demand on schools or recreational facilities. In addition, there are no police, fire, school, or recreational facilities located within the project site or in the immediate project vicinity; therefore, the project would have no direct effect on public services or recreation. **No impact** would occur and these technical issue areas are not discussed further in this SEIR.

Utilities and Service Systems

The landfill does not connect to local or regional water, wastewater, or natural gas utility infrastructure. Further, none of the proposed amendments to the landfill's LUP would increase demand for such utilities.

The RHR Landfill is not connected to a municipal water system and does not use potable water. Employees are provided with bottled water for consumption. The site maintains one 10,000-gallon water tank that is supplied by dewatering of the borrow pit. The tank supplies RHR's 4,000-gallon water truck, which is used for dust control on onsite roadways. Use of non-potable water onsite is limited to dust control and washing/restroom uses at the office; implementation of the project is not expected to change the volume of water use onsite. (Wolfe, pers. Comm., 2018). Recology would continue to use water from borrow pit dewatering for dust control. No modification or expansion of the landfill's administrative functions, including the hiring of additional employees, that could result in additional potable water demand would occur as a result of the project. Therefore, **no impact** would occur and this topic is not discussed further in this SEIR.

With respect to wastewater, existing wastewater supplies are collected via an onsite septic system and because no expansion of administrative or other use that would require septic service would occur under the project, no expansion of wastewater infrastructure is anticipated. Therefore, **no impact** would occur and wastewater is not discussed further in this SEIR.

The landfill is not currently served by natural gas facilities, and no new natural gas facilities are included as part of the proposed project. Therefore, **no impact** would occur and natural gas usage is not discussed further in this SEIR.

The proposed project would not result in any changes to demand for electricity or telecommunication service or facilities at the landfill as none of the proposed amendments to the LUP would result in an increase in demand for such services; therefore, **no impact** would occur and these topics are not discussed further in this SEIR.

No new utilities would need to be constructed with implementation of the project. Because no new utilities would be constructed, the project would not have the potential to disrupt or damage any existing utilities or utility services. Further, relocation of existing water, wastewater, electricity, natural gas, or telecommunications facilities would not occur as a result of the project. Therefore, **no impact** would occur and utilities are not discussed further in this SEIR.

With respect to solid waste, some additional solid waste (i.e., construction debris) may be generated during construction but would be accommodated onsite. Further, any excess soils associated with construction of either the proposed flare or the lateral expansion into the Triangle would be used onsite as daily ground cover within the active disposal areas of the landfill and would not require offsite hauling or disposal at another solid waste facility. Therefore, **no impact** would occur and construction waste from project implementation is not discussed further in this SEIR.

4.1 AESTHETICS

This section describes existing visual characteristics at the project site and surrounding area, and provides an assessment of short- and long-term visual changes that would result from project implementation. The analysis focuses on the views of the project site from offsite sensitive receptors (e.g., residential structures and State Route 113 [SR 113], a County designated scenic highway) in the vicinity of the project site.

Comments related to landfill litter and dust located outside of the landfill boundaries were received during public review of the Notice of Preparation (NOP) for the proposed project.

4.1.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

No federal plans, policies, or regulations related to aesthetics are applicable to the proposed project.

STATE PLANS, POLICIES, AND REGULATIONS

California Code of Regulations

Title 14 and 27 of the California Code of Regulations (CCR) require landfills and transfer stations to control litter and dust, which can have an adverse effect on visual quality. Specifically, Title 27 requirements include the following:

- Section 20830 Litter Control: Litter shall be controlled, routinely collected, and disposed of properly. Windblown materials shall be controlled to prevent the accumulation, or offsite migration, of litter in quantities that create a nuisance or cause other problems.
- Section 20800 Dust Control: The operator shall take adequate measures to minimize the creation of dust and prevent safety hazards due to obscured visibility.

Title 14, Chapter 3, Minimum Standard for Solid Waste Handling and Disposal, which applies to transfer stations and landfills, includes the following operating standards:

- ► 17408.1 Litter Control: Litter at operations and facilities shall be controlled, and routinely collected to prevent safety hazards, nuisances or similar problems and offsite migration, to the greatest extent possible given existing weather conditions.
- ► 17407.4 Dust Control: (a) The operator shall take adequate measures to minimize the creation, emission, or accumulation of excess dust and particles, and prevent other safety hazards to the public caused by obscured visibility. The operator shall minimize the unnecessary handling of wastes during processing to prevent the creation of excessive dust. Measures to control dust include, but are not limited to: reduced processing, periodic sweeping and cleaning, misting systems or ventilation control.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County General Plan

The project site is located in Solano County and subject to the 2008 Solano County General Plan (Solano County 2008). SR 113 from the Interstate 80 interchange in Dixon to its intersection with State Route 12 is designated as a County Scenic Roadway. Aesthetic and scenic resources are discussed in the Resources Element of the General Plan, which includes the following policies and implementation programs that are relevant to the proposed project:

- Policy RS.P-36: Support and encourage practices that reduce light pollution and preserve views of the night sky.
 - Implementation Program RS.I-22: In new developments, require the use of fixtures that direct light toward target areas and shield it from spillage.
- ▶ Policy RS.P-37: Protect the visual character of designated scenic roadways.
 - Implementation Program RS.I-21: Preserve the visual character of scenic roadways as shown in Figure RS-5 through design review, designating alternate routes for faster traffic, regulating offsite advertising, limiting grading in the view corridor through the grading ordinance, limiting travel speeds, and providing pullover areas with trash and recycling receptacles.

4.1.2 Environmental Setting

REGIONAL LANDSCAPE CHARACTER

Solano County covers 910 square miles, including 84 square miles of water area and 675 square miles of rural land area (Solano County 2015). The western portion of the county extends into the foothills of the coastal range, which is characterized by steep slopes; however, the remainder of the county is located within the Sacramento Valley and characterized by level topography with some isolated areas of low rolling hills. Visually, the rural landscape is predominantly irrigated pasture, row crops, and orchards with limited accessory buildings and rural residences scattered throughout. Important scenic resources include the County's agricultural landscapes, the delta and marshlands, and oak and grass covered hills. A portion of State Route (SR) 37 traverses the southwestern portion of the county and is eligible for designation as a State Scenic Highway (Caltrans 2011). This segment of highway is more than 23 miles from the project site and is not visible from the landfill. A number of County Scenic Roadways are located throughout the county (Solano County 2008: Figure RS-5), however, SR 113 is the only County Scenic Roadway located in proximity to the project site. No other scenic roadways provide views of the landfill.

LANDSCAPE CHARACTER OF THE PROJECT SITE AND SURROUNDING AREA

The project site is located in an unincorporated area of Solano County, southwest and adjacent to the intersection of Hay Road and SR 113 (Figure 4.1-1). The topography of the surrounding area is essentially flat with a ground surface elevation of approximately 25 feet above mean sea level. The Vaca Mountains to the northwest provide visual relief in the middle ground and background viewing distance from the otherwise flat valley floor, and attract visual attention from those at lower elevations to the southeast. Other visual features in the valley landscape include rural houses, stands of trees and farm equipment. Vegetation in the region consists mostly of introduced non-native grasses; however, there are remaining examples of native grassland and vernal pool vegetation. Land uses in the area consist primarily of open space for livestock grazing and dry-land farming. A handful of rural residences are located in the greater project area.

The visual character of the project site includes the existing developed landfill area where waste acceptance activities and composting operations are ongoing. The facility is surrounded by a six-foot chain-link fence with a taller litter control fence located along the perimeter of the landfill adjacent to Hay Road and SR 113. The current height of the existing landfill modules range from approximately 18 feet above mean sea level (MSL) to 145 MSL. The existing landfill is a major visual feature in the project area because of the lack of other features that rise above the valley floor. The majority of views to the site consist of large mounds of inactive disposal modules that are now covered by a soil cap and resembles rolling hills. With the exception of portions of Hay Road and SR 113, views of the site available to motorists on adjacent roadways consist primarily of steep, grass-covered terrain (i.e., landfill perimeter slopes) that obstructs views of landfill operations (Figure 4.1-2 and Figure 4.1-3, Viewpoints A-C).



Figure 4.1-1 Photograph Viewpoints





Viewpoint A - Hay Road looking south towards Triangle



Viewpoint B - Hay Road at SR 113 intersection looking southwest

Source: Images prepared and provided by Ascent Environmental in2019

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Figure 4.1-2 Photo Viewpoints A and B





Viewpoint D - SR 113 looking northwest from the bird sanctuary

Source: Images prepared and provided by Ascent Environmental in2019

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Figure 4.1-3 Photo Viewpoints C and D



Most views of landfill operations to motorists driving along the eastern portion of Hay Road and SR 113 are partially screened or obstructed because of steep terrain surrounding the landfill boundary. Located along the northwestern boundary of the project site along Hay Road is a row of eucalyptus trees that stretches approximately ½ mile and partially screens views of the project site from motorists. Some unobstructed views of landfill operations are available to motorists on Hay Road and include the landfill entrance, administrative building, and JPO facility located in the center of the site. As motorists on SR 113 approach the landfill property, views of active landfill operations (i.e. views of trucks and refuse) are possible (Figure 4.1-3, Viewpoint D). For motorists viewing the site from a distance, the landfill modules appear as rolling hills against the background of the Vaca Mountain range (Figure 4.1-4, Viewpoint E).

The nearest residence to the project site is located over one mile to the north. Due to the distance between the project site and the nearest residences, the facility presents only a very low visual profile to residents and only low quality views of the site are possible to residents. There are no public parks, schools, or designated viewing areas with a high quality view of the project site. There are no rock outcroppings or historic buildings within or adjacent to the project site. SR 113 is designated as a local scenic roadway in the Solano County General Plan (Figure RS-5; p. RS-39: 2008).

VIEWER EXPOSURE AND SENSITIVITY

Viewer sensitivity is an important consideration in assessing the impacts of visual change and is a function of several factors. The sensitivity of the viewer or viewer concern is based on the visibility of resources in the landscape, proximity of the viewers to the visual resource, elevation of the viewers relative to the visual resource, frequency and duration of views, numbers of viewers, and types and expectations of individuals and viewer groups.

The viewer's distance from landscape elements plays an important role in determining an area's visual quality. Visibility and visual dominance of landscape elements depend on their placement within a viewshed. A viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (FHWA 2015). Landscape elements are considered higher or lower in visual importance based on their proximity to the viewer. Generally, the closer a resource is to the viewer, the more dominant, and thus the more visually important it is to the viewer. For purposes of analysis, landscapes are separated into foreground, middleground, and background views (USFS 1995). In general, the foreground is characterized by clear details (within 0.25 or 0.5 mile of the viewer); the middleground is characterized by the loss of clear detail in a landscape, creating a uniform appearance (from the foreground to 3 to 5 miles in the distance); and the background extends from the middleground to the limit of human sight (Bacon 1979).

Visual sensitivity is also affected by viewer activity, awareness, and expectations in combination with the number of viewers and the duration of the view. Visual sensitivity is generally higher for views that are observed by people who are driving for pleasure, or engaging in recreation activities such as hiking, biking, camping or by residents of an area. Sensitivity is lower for people engaged in work activities or commuting to work. Viewer response must be based on regional context. The same landform or landscape feature may be valued differently in different settings; landscape features common in one area would not be valued as highly as the same feature in a landscape that generally lacks similar features. For example, a small hill may have little value in a mountainous area, but may be highly valued in a landscape that has little topographic variation.

The primary viewer group to which the project site is visible is motorists on the surrounding public roadways (i.e., Hay Road, SR 113, and Brown Road) and would be expected to have the most sensitivity to changes in views because of their close proximity to the site. Project viewpoints from surrounding roads are described in more detail below.

Viewpoints

Five representative viewpoints from surrounding public roadways were selected and are shown in Figures 4.1-1 through 4.1-4. In addition to use of representative viewpoints, this analysis utilizes information from a field reconnaissance of the project area conducted in March 2018 as well as Google Maps street views. Most views of landfill operations at the project site are screened by steep terrain at the landfill boundaries.



Viewpoint E - SR 113 looking northwest at the site

Source: Images prepared and provided by Ascent Environmental in2019

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Light and Glare Conditions

The terms "glare" and "skyglow" are used in this analysis to describe the visual effects of lighting. For the purposes of this impact analysis, glare is considered to be direct exposure to bright lights and skyglow is a glow that extends beyond the light source and can dominate or partially dominate views above the horizon.

The RHR Landfill has a light control program because of the proximity of Travis Air Force Base and other municipal and private airfields. Fixed and portable lighting units are used to illuminate portions of the site during nighttime operations. Night lighting is downcast and shielded to prevent offsite glare and confine lighting to the work area. The landfill's light control plan limits portable nighttime lighting for specific occasions (i.e., at the public drop-off center as needed to process peak loads of recyclables and during base liner preparation work if the operator determines daytime temperatures are too high for efficient Leachate Collection and Removal System [LCRS] placement over geomembrane). Low energy security lighting (ex., high-pressure sodium lights) is installed at the maintenance shop and office facilities. The surrounding area is generally unlit except for a few streetlamps near the landfill's entrance and headlights from vehicles on nearby roadways. These light sources, in addition to the landfill, contribute to nighttime glare and skyglow effects in the project vicinity.

4.1.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Based on Appendix G of the CEQA Guidelines, the project would result in a potentially new significant impact, or substantial increase in a previously identified significant impact, related to aesthetic resources if it would:

- have a substantial adverse effect on a scenic vista;
- substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway or other designated scenic corridor;
- ► substantially degrade the existing visual character or quality of the site and its surroundings; or
- create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

METHODOLOGY

Buildings and other structures in the project vicinity, views across agricultural and open space land, and locations of residences and businesses in the project vicinity were considered when evaluating the general visual quality and character of the project area. The sensitivity of the viewer or viewer concern is a consideration in evaluating impacts of visual change. Viewer sensitivity is based on the visibility of resources in the landscape, proximity of the viewers to the visual resource, elevation of the viewers relative to the visual resource, frequency and duration of views, numbers of viewers, and types and expectations of individuals and viewer groups. Visual sensitivity is generally higher for views that are observed by people who are driving for pleasure, or engaging in recreation activities such as hiking or biking or by residents in close proximity to their homes. Sensitivity is lower for people engaged in work activities or commuting to work.

Viewer Groups and Viewer Awareness and Sensitivity

Most public viewers of the existing landfill are motorists on SR 113, Hay Road, and Brown Road. Travel speeds are relatively high (55 miles per hour) on SR 113; therefore, views of the project site are peripheral, of short duration, and/or screened by existing topography along the perimeter of the landfill.

Distant views of the landfill may be available to rural residents located a mile or more from the project site. The nearest resident, located a mile north of the site, would have middleground views of the landfill property and low sensitivity to visual change from this area and distance. Motorists would have foreground and/or middleground views of the landfill but the views would be of shorter duration and partially and/or fully screened by onsite topography; therefore, drivers may have a low sensitivity to visual change.

ISSUES NOT DISCUSSED FURTHER

A scenic vista is generally considered a view of an area that has remarkable scenery or a natural feature or cultural resource that is indigenous to the area. The project site and surrounding area do not contain any scenic vistas; therefore, the project would not have a substantial adverse effect on a scenic vista, and this topic is not addressed further in this SEIR.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.1-1: Temporary Changes in Visual Character

Temporary changes in views would occur as a result of construction activities, primarily related to the presence and operation of heavy equipment associated with lateral expansion of the landfill within the Triangle. These activities would include excavation of a realigned drainage ditch segment, construction of a 10-foot high perimeter berm, and installation of a required base liner containment system. Foreground views of these construction activities would be available to motorists heading northbound on SR 113. These changes would be temporary, largely screened from outside views, and not out of character with the existing landfill operations onsite. Therefore, the temporary changes as a result of the proposed project would not substantially degrade views of the project site. This impact would be **less than significant**.

Construction of the lateral landfill expansion of the Triangle is anticipated to occur over the summers of 2021 and 2022 and would include grading activities, installation of a base liner containment system, excavation for the realigned drainage ditch segment, and construction of a 10-foot high perimeter berm. The Triangle area is located approximately 0.25-mile from SR 113. During construction, foreground views of heavy equipment and associated vehicles, construction workers, staging areas, and construction activities within the Triangle would be visible from motorists heading northbound on SR 113. Due to distance and intervening landscape, construction activities would not be discernable to motorists on SR 113 with middleground or background views of the site. With the exception of northbound SR 113, views of the Triangle are obscured from other surrounding viewpoints by intervening distance, existing landfill modules located east, west, and north, vegetation, and/or steep terrain surrounding the eastern half of the landfill boundary. Views of equipment onsite would be similar to views of equipment used in routine operation of landfill operations currently surrounding the Triangle and would not result in a substantial change in views. In addition, these changes in views would be temporary and none of the changes would be visible from Viewpoints A-C.

Construction of the lateral landfill expansion within the Triangle would include the use of construction equipment; however, changes in views would be temporary and would only be visible to motorists travelling northbound on SR 113 with foreground views of the site. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

Impact 4.1-2: Long-Term Adverse Changes in Visual Character

Lateral expansion of the landfill into the Triangle area and modification of existing landfill operations near the landfill's existing administrative office (i.e. storage of baled recyclables and addition of a new flare at G2 facility) would result in changes to views of the project site. However, views of the landfill expansion and operation modifications would be consistent and blend in with existing views of landfill operations from Hay Road and immediately north, east, and west of the Triangle area. Further, design of the landfill expansion area would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope along the southern boundary of the Triangle to screen views of landfill operations onsite and substantial adverse changes would not occur. With project implementation, the increase in truck trips and the expansion of the landfill into the Triangle area could result in an increase in the amount of windblown litter generated from the facility. Although existing litter removal is governed by the 2016 RHR Road and Litter Agreement, it does not factor in the proposed lateral expansion and increase in truck trips. Therefore, the impact is considered **potentially significant**.

Currently, the Triangle area is largely undeveloped open space with a private gravel road that is directly adjacent to existing landfill disposal areas to the south, east, and west. Lateral expansion of the landfill disposal area is proposed within 16-acres of the 24-acre Triangle (the Triangle includes an approximately 8-acre existing setback area). Views of the Triangle would change, therefore, to include the expanded disposal area. While this area is visible to landfill workers and customers and to northbound motorists on SR 113, the expansion area is consistent with adjacent landfill disposal area development and ongoing landfill operations. To enhance and partially screen views of the landfill expansion area from SR 113, the project would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope at its southern boundary. Views of the Triangle from SR 113 would blend in with adjacent onsite uses and would be partially screened by vegetated landfill perimeter slopes. In addition, a rounded, rolling land formation at final grade is proposed to enhance the aesthetic appearance of the Triangle, consistent with final grade of surrounding disposal modules. Due to distance and intervening landscape, construction activities would likely not be discernable to motorists on SR 113 with middleground or background views of the site.

In addition to the lateral expansion, four bale stockpiles and the addition of a new flare are proposed and would be visible to motorists on Hay Road as they pass the center of the property. Specifically, the stockpiles and flare would be located near the existing administrative buildings and G2 Landfill Gas to Energy facility (shown in Figure 3-2 of this Draft SEIR). The stockpiles would be located a minimum of 180 feet from the edge of Hay Road with a combined maximum allowable size of 40 feet wide by 105 feet long by 12 feet high and would be partially screened by existing structures (ex. office building and G2 Landfill Gas to Energy facility structures). The new flare would be located within the existing G2 Landfill Gas to Energy facility and comparable in size to existing onsite flares (i.e. 9.5 feet in diameter and 30 feet in height) within the G2 facility (see Figure 3-2 of this document). Both project features would be visually consistent with existing views of landfill and JPO-related structures located in this portion of the site.

As a result, while the change in visual character as a result of the proposed project would be noticeable from foreground views to motorists on SR 113 and Hay Road, it would not be considered a substantial adverse change because the proposed project features are consistent with the current visual condition of the site.

Lateral expansion of the landfill disposal area as well as the addition of baled recyclable stockpiles and an additional flare would result in changes to views from SR 113 and Hay Road; however, these changes would be consistent with existing landfill operations onsite and would not result in substantial adverse modifications to existing views. Therefore, this impact would be less than significant.

With the proposed increase in peak daily tonnage and additional truck trips associated with the temporary storage of recyclable material, peak daily vehicle trips could increase at the RHR Landfill. This increase could potentially increase the amount of windblown litter generated from the facility. The generation of litter from the transport of solid waste and facility operations was identified as a potentially significant impact requiring mitigation in the 1993 Final EIR and 2012 Initial Study/ Mitigated Negative Declaration (IS/MND). The mitigation from the 1993 Final EIR and 2012 IS/MND required the facility operator to use portable litter fences on an ongoing basis and to routinely pick up litter on adjacent properties and roadways. The mitigation also required the facility operator to install a permanent litter fence

around the site perimeter. The impact was considered less than significant following implementation of the identified mitigation measures.

Although the facility is currently surrounded by a six-foot chain-link fence with a 25-foot tall litter control fence located along the portions of the northern and western perimeter of the existing landfill, the lateral expansion of the landfill into the Triangle area and the potential for increase in litter generation from the facility due to increased truck trips could result in the scattering of windblown litter along the haul routes and onto adjacent agricultural parcels from the working face. If the litter remained on the adjacent parcels and roads for extended periods, it could degrade the visual character of the surrounding land uses. This impact is considered **potentially significant**.

Mitigation Measures

Mitigation Measure 4.1-1: Litter Control

The facility operator shall implement the following litter control mitigation measures to address the lateral landfill expansion area and/or the increase in landfill truck trips following implementation of the proposed project:

- ► Windblown Litter from the RHR Site:
 - Portable litter control fences shall be installed directly downwind of the working face during site operations.
 - Additional litter collection crews shall be deployed following high wind events to remove litter from the
 parcels adjacent to the landfill. The RHR facility operator shall work to establish site access agreements with
 the adjacent property owners prior to project implementation.
 - The maximum size of the working face shall be limited to 200' x 75' or smaller.
 - Use of portable fencing in the immediate vicinity of the landfills working face and downwind of the working face shall be used to contain litter.
 - Fencing along the site boundary of the landfill expansion area shall be high enough to contain litter from migrating offsite.
 - Prior to the start of landfill operations within the expansion area, RHR shall construct a permanent 25 ft. tall litter-control fence that extends along the entire length of the southerly site boundary of the landfill expansion area.
 - Adequate staffing shall be onsite to remove litter immediately from the property boundary in the event of a sudden change in wind speed or direction. Similarly, additional litter collection crews shall be deployed following such high wind events to remove litter from parcels adjacent to the landfill. The permittee (RHR) shall establish site access agreements with the adjacent property owners within 90 days of issuance of the use permit.
- ► Windblown Litter from RHR-Related Truck Trips:
 - If waste is hauled by RHR or its contractors over the following roads, RHR shall check for and pick up litter, on a weekly basis, or more frequently, on the following roads: Vanden Road from Peabody Road to Canon Road, Canon Road from Vanden Road to North Gate Road, North Gate Road from Canon Road to McCrory Road, McCrory Road from North Gate Road to Meridian Road, Meridian Road from McCrory Road to Hay Road, Hay Road from Meridian Road to Lewis Road, Lewis Road from Midway Road to Fry Road, and Midway Road from I-80 to SR 113.
 - If Solano County personnel identify litter on roads used by RHR and its contractors, Solano County shall immediately notify RHR and request that it be removed. RHR shall respond and remove such litter within twenty-four (24) hours of receiving notification from Solano County.

- Litter Control:
 - The facility operator shall negotiate an agreement with Solano County regarding reimbursement for the cost
 of removing trash and materials dumped along the above mentioned County roads, should County
 employees be required to assist in the removal of trash associated with the expanded use of the landfill.
 - Litter control shall be the responsibility of the RHR compliance officer and shall be monitored by the Solano County Local Enforcement Agency (LEA) to ensure compliance with state minimum standards. A plan for litter control, by means of fencing, crews, adjustment of the size of working the face and use of soil cover, shall be detailed in the litter management plan.
 - On a weekly basis, or more frequently if needed, RHR shall check for and pick up litter along adjacent properties, and along Burke Lane south of Hay Road, Dally Road north and south of Hay Road, Box R Ranch Road, Binghampton Road between SR 113 and Pedrick Road, Main Prairie Road between SR 113 and Pedrick Road, Brown Road between SR 113 and Pedrick Road, Pedrick Road between Brown Road and Binghampton Road, and along the following major haul routes: Fry Road between Leisure Town Road and SR 113, Lewis Road between Fry Road and Hay Road, Hay Road between SR 113 and Meridian Road, and Meridian Road between McCrory Road and Fry Road. The site, offsite properties, and roads listed above shall be kept as litter free as possible depending upon weather conditions. The County shall not be charged for disposal of litter or trash picked up during these activities. Within 90 days of the issuance of the land use permit, RHR shall execute an agreement with Solano County regarding reimbursement to the County for the cost of removing trash and materials dumped along the above mentioned County roads, should County employees be required to assist in the removal of trash associated with use of the RHR landfill in the event that RHR does not remove the litter within 24 hours of receiving notification from Solano County.

Significance after Mitigation

Implementation of Mitigation Measure 4.1-1, which is a continuation of existing litter control measures from the RHR landfill's existing LUP (U-11-09), measures provided in Chapter 9 of the 1993 EIR (p. 9-17), and Mitigation Measure 1 from the RHR Landfill's 2012 IS/MND, would reduce potentially significant impacts related to long-term adverse changes in visual character because the potential for an increase in scattering of windblown litter onto adjacent parcels and roads would be reduced with implementation of required litter control measures. In addition, the Road Damage and Fee Agreement is updated regularly and will continue to be implemented. With implementation of Mitigation Measure 4.1-1, this impact would be reduced to a less-than-significant level.

Impact 4.1-3: Potential to Substantially Damage or Change Views from Any Scenic Resources Within a Designated Scenic Corridor

SR 113 is a County Scenic Roadway located adjacent to the eastern boundary of the RHR Property boundary and approximately 0.25 mile from the Triangle area. Foreground views of the expanded landfill into the Triangle area would be available to motorists on northbound SR 113. Foreground views of the Triangle from SR 113 may include new views of landfill operations (i.e., trucks and refuse) within this area of the site. However, views of the expanded landfill area would be consistent with and blend into existing views of landfill operations located immediately north, east, and west of the Triangle. Consistent with existing landfill design onsite, the landfill expansion area would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope to partially screen views of landfill operations from SR 113. At final grade, a rounded, rolling land formation is proposed to enhance the aesthetic appearance of the landfill modules. With implementation of the project, changes to views of the Triangle from SR 113 would be consistent with existing views of landfill operations and design measures included in the project would partially screen views of the landfill expansion area from SR 113 motorists. This impact would be **less than significant**.

The lateral landfill expansion is proposed in a triangular area surrounded by existing landfill operations (see Figure 3-2 of this Draft SEIR) that is visible to motorists heading northbound on SR 113, a County Scenic Roadway. No other scenic resources or designated scenic corridors are in the project vicinity and other elements of the project are not visible to motorists on SR 113 because of intervening topography and distance.

The lateral landfill expansion into the Triangle area is located 0.25 mile from SR 113. Due to distance and intervening landscape, landfill expansion within the Triangle would likely not be noticeable to motorists on SR 113 with middleground or background views of the site. Foreground views of the landfill expansion area and operations would be available to motorists heading northbound on SR 113. However, views of the site would be temporary to passing motorists and an active landfill is currently located immediately north, east, and west of the Triangle (see Figure 3-2 of this Draft SEIR). Therefore, views of the expanded landfill area would blend in with surrounding views, resulting in a minor change to views from SR 113. Consistent with existing landfill design onsite, the landfill expansion area would include vegetated landfill perimeter slopes with a 4:1 (horizontal: vertical) slope that would partially screen views of landfill operations from SR 113. At final grade, a rounded, rolling land formation is proposed to enhance the aesthetic appearance of the landfill modules. Therefore, the proposed project would not substantially damage or change views from any scenic resources within a state scenic highway or other designated scenic corridor, including but not limited to trees, rock outcroppings, and historic buildings. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

Impact 4.1-4: Potential for Increased Light and Glare

The existing landfill includes fixed and portable nighttime lighting, which would continue after implementation of the project. No new sources of fixed lighting are proposed. The project would include base liner preparation work during construction of the landfill expansion area that could result in the need for occasional and temporary portable nighttime lighting lf the operator determines daytime temperatures are too high. Use of portable nighttime lighting under this circumstance is allowable under the landfill's light control program and would require downcast and shielded lighting to prevent offsite glare and confine lighting to the work area. This impact would be **less than significant**.

The landfill's existing light control program allows for fixed and portable lighting units to illuminate portions of the site during nighttime operations. The landfill's light control program limits onsite lighting considerably and is consistent with Policy RS.P-36 of the Solano County General Plan (2008: p. RS-37). Night lighting is downcast and shielded to prevent offsite glare and confine lighting to the work area. Low energy security lighting (ex., high-pressure sodium lights) is installed at the maintenance shop and office facilities. No new sources of fixed lighting are proposed. The landfill's light control program allows portable nighttime lighting for specific occasions, including base liner preparation work when the operator determines daytime temperatures are too high. During construction of the landfill expansion area, use of portable nighttime lighting may be needed on occasion for base liner preparation work. This use of portable nighttime lighting would be temporary, consistent with the existing lighting program, and would not introduce substantial new sources of light or glare.

Therefore, because no additional sources of fixed lighting are included as part of the project and any portable lighting to be used onsite would be limited to base liner preparation work, as needed, during construction of the landfill expansion area, the proposed project would not introduce substantial new sources of light or glare. In addition, the nearest residence is located one mile from the RHR Landfill; therefore, light spillover from nearby residences would not occur due to distance. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

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4.2 AIR QUALITY

This section includes a discussion of existing air quality conditions, a summary of applicable regulations, and an analysis of potential construction and operational impacts to air quality caused by the project.

Comments pertaining to air quality received in response to the Notice of Preparation (NOP) for the project included the need for the project to quantify increases in daily emissions of criteria air pollutants, especially ozone, as well as a reminder that modifications to daily throughput limits would require amendments to permits from the local air district.

4.2.1 Regulatory Setting

Air quality in the project area is regulated through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, planning, policy making, education, and a variety of programs. The agencies responsible for improving the air quality within the air basin are discussed below.

FEDERAL

U.S. Environmental Protection Agency

The EPA has been charged with implementing national air quality programs. EPA's air quality mandates draw primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments were made by Congress in 1990. EPA's air quality efforts address criteria air pollutants, ozone precursors, and hazardous air pollutants (HAPs). EPA regulations concerning criteria air pollutants and precursors and HAPs are presented in greater detail below.

Criteria Air Pollutants

The CAA required EPA to establish national ambient air guality standards (NAAQS) for six common air pollutants found all over the U.S. referred to as criteria air pollutants. EPA has established primary and secondary NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter with aerodynamic diameter of 10 micrometers or less (PM₁₀) and fine particulate matter with aerodynamic diameter of 2.5 micrometers or less (PM_{2.5}), and lead. The NAAQS are shown in Table 4.2-1. The primary standards protect public health with an adequate health margin for safety and the secondary standards protect public welfare from adverse effects, including those related to effects on soils, water, crops, vegetation, human-made materials, animals, wildlife, weather, visibility, and climate. The CAA also required each state to prepare a State Implementation plan (SIP) for attaining and maintaining the NAAQS. The federal Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. California's SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments, and whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, EPA may prepare a federal implementation plan that imposes additional control measures. If an approvable SIP is not submitted or implemented within the mandated time frame, sanctions may be applied to transportation funding and stationary air pollution sources in the air basin.

Dellutent	A	Californiaah	National ^c			
Pollutant	Averaging time	California	Primary ^{b,d}	Secondary ^{b,e}		
1-hour		0.09 ppm (180 μg/m³)	_	Concernation of the second		
Ozone	8-hour	0.070 ppm (137 μg/m ³)	0.070 ppm (147 μg/m³)	Same as primary standard		
	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)			
Carbon monoxide	8-hour	9 ppm ^f (10 mg/m ³)	9 ppm (10 mg/m ³)	Same as primary standard		
Niture en eliquide	Annual arithmetic mean	0.030 ppm (57 μg/m³)	53 ppb (100 μg/m³)	Same as primary standard		
Nitrogen dioxide	1-hour	0.18 ppm (339 µg/m³)	100 ppb (188 μg/m³)	—		
	24-hour	0.04 ppm (105 μg/m³)	—	—		
Sulfur dioxide	3-hour	—	—	0.5 ppm (1300 μg/m³)		
	1-hour	0.25 ppm (655 μg/m³)	75 ppb (196 μg/m³)	—		
Respirable	Annual arithmetic mean	20 μg/m ³ —		Sama as primany standard		
particulate matter	24-hour	50 μg/m³	150 μg/m³	same as primary standard		
Fine particulate	Annual arithmetic mean	12 µg/m ³	12.0 μg/m ³	15.0 μg/m ³		
matter	24-hour	—	— 35 μg/m ³			
	Calendar quarter	—	1.5 μg/m ³	Same as primary standard		
Lead ^f	30-Day average	1.5 μg/m ³	_	—		
	Rolling 3-Month Average	—	0.15 μg/m ³	Same as primary standard		
Hydrogen sulfide	1-hour	0.03 ppm (42 μg/m ³)				
Sulfates	24-hour	25 μg/m ³		No		
Vinyl chloride f	24-hour	0.01 ppm (26 μg/m³)	national			
Visibility-reducing particulate matter	8-hour	Extinction of 0.23 per km	n standards			

Table 4.2-1 Ambient Air Quality Standards

Notes: $\mu g/m^3$ = micrograms per cubic meter; km = kilometers; ppb = parts per billion; ppm = parts per million.

^a California standards for ozone, carbon monoxide, SO₂ (1- and 24-hour), NO₂, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

^b Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

^c National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. The PM_{2.5} 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

^d National primary standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

^e National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

^f The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: CARB 2016a

Hazardous Air Pollutants and Toxic Air Contaminants

Toxic air contaminants (TACs), or in federal parlance, HAPs, are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage; or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and non-carcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. This contrasts with criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 4.2-1). Cancer risk from TACs is expressed as excess cancer cases per one million exposed individuals, typically over a lifetime of exposure.

EPA regulates HAPs through its National Emission Standards for Hazardous Air Pollutants. The standards for a particular source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology—MACT standards. These standards are authorized by Section 112 of the 1970 Clean Air Act and the regulations are published in 40 CFR Parts 61 and 63.

The Clean Air Act Amendments of 1977 required the EPA to identify and set forth National Emission Standards for Hazardous Air Pollutants to protect public health and welfare. The Clean Air Act Amendments of 1990 established a technology-based approach for reducing air toxics, such that designated HAPs are regulated under a two-phase strategy. The first phase involves requiring facilities to install Maximum Achievable Control Technology (MACT). MACT includes measures, methods and techniques, such as material substitutions, work practices, and operational improvements, aimed at reducing toxic air emissions. MACT standards already exist in draft or final form for over 50 percent of the 174 source categories (under the air toxics program, facilities having similar operating processes are grouped into categories) that are to be eventually regulated. In September 1999, EPA promulgated the Urban Air Toxics Strategy (UATS), which identifies pollutants and sources that have been determined to be issues in urban areas and is the second phase of the agency's two-phase process for regulation of air toxics. Landfills are included on the regulated source list for the UATS due to their emissions of vinyl chloride, benzene, and other TACs.

New landfills, as defined by the EPA, are regulated under Section 111(b) of the federal CAA; existing landfills are controlled under the guidelines of Section 111(d). Collectively, these regulations are known as New Source Performance Standards (NSPS) and Emissions Guidelines (EG) for municipal solid waste (MSW) landfills, as originally published by the EPA in 1999. The MSW Landfill NSPS and EG were promulgated by the EPA under Subpart WWW and Subpart Cc, respectively, of Title 40 of the Code of Federal Regulations (CFR), Part 60.

Under NSPS regulations, a new landfill is defined as an MSW landfill that started construction or began initial waste acceptance on or after May 30, 1991. A landfill modification (e.g., expansion) that occurred after May 30, 1991, would also subject the landfill to the NSPS under 40 CFR 60, Subpart WWW. The EG, per 40 CFR Part 60, Subpart Cc, apply to existing landfills that commenced construction or were modified before May 30, 1991, and that have accepted waste at any time since November 8, 1987. The requirements of EG are similar to those of NSPS, except that the state in which the landfill is located plays a role in establishing the actual regulations through the SIP process. MSW landfills that meet the above criteria and have a design capacity greater than 2.5 million megagrams (or 2.5 million cubic meters) of waste must evaluate NMOC emissions to determine their requirements under the NSPS or EG rules.

On August 29, 2016, the EPA published new landfill gas (LFG) rules in the Federal Register. These included a new NSPS rule under 40 CFR 60, Subpart XXX, as well as emission guidelines for existing MSW landfills under 40 CFR 60, Subpart Cf, which replace Subparts WWW and Cc, respectively. Subpart XXX applies to new landfills, including those modified on or after July 17, 2014, while existing landfills include those built or modified before this date. The intent of

the new NSPS rule and emission guidelines is to reduce emissions of LFG. The pollutants of concern contained within LFG are non-methane organic compounds (NMOC) and methane.

Compliance requirements are based on the design capacity of the landfill and its NMOC emission rate to be calculated using the EPA's Landfill Generation Emissions Model (LandGEM) and default model inputs. Under Subparts XXX and Cf, if a landfill exceeds a threshold of 34 megagrams (approximately 37.5 tons) per year of NMOC emissions, then the operator must install LFG collection and control systems to extract and destructively combust LFG (i.e., in a flare, boiler, or engine generator). Operations, monitoring, record keeping, and reporting for the collection/control system must be implemented in accordance with stated requirements. Because of its current design capacity, RHR Landfill is subject to the NSPS under Subpart XXX. The proposed expansion is not expected to alter the NSPS compliance activities.

Under the Clean Air Act Amendments of 1990, major stationary sources are required to obtain Title V operating permits. Title V is a federally enforceable, state operating permit program set forth under 40 CFR Part 70. Major sources of criteria air pollutants or TACs are required to apply for and obtain Title V operating permits. The Title V programs are developed at the state or local level, as outlined in 40 CFR Part 70. All landfills subject to NSPS or emissions guidelines are also subject to Title V, regardless of emissions or major source status. A Title V permit is an umbrella permit, which consolidates all federal, state, and local air quality regulations and requirements into one permit. Although the Title V permit is required in addition to any Authority to Construct (ATC) permits or Permits to Operate (PTO) required by any local agency, these additional permits are incorporated into the Title V permit and, thus, the Title V permit becomes the overall guiding document for air quality compliance at a site. Currently, the RHR Landfill has a Title V Operating Permit (No. F-01059-15).

STATE

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required CARB to establish California ambient air quality standards (CAAQS) (Table 4.2-1).

Criteria Air Pollutants

CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to attain and maintain the CAAQS by the earliest date practical. The CCAA specifies that local air districts should focus attention on reducing the emissions from transportation and area-wide emission sources. The CCAA also provides air districts with the authority to regulate indirect emission sources.

Toxic Air Contaminants

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (Hot Spots Act) (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified 21 TACs and adopted EPA's list of HAPs as TACs. Particulate matter exhaust from diesel engines (diesel PM) is one of the TACs identified by CARB.

After a TAC is identified, CARB then adopts an airborne toxics control measure for sources that emit that particular TAC. If a safe threshold exists for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If no safe threshold exists, the measure must incorporate best available control technology for toxics to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare an inventory of toxic emissions, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

California Assembly Bill 617 (AB 617) of 2017 aims to help protect air quality and public health in communities around industries subject to the state's cap-and-trade program for GHG emissions. AB 617 imposes a new state-mandated local program to address non-vehicular sources (e.g., refineries, manufacturing facilities) of criteria air pollutants and TACs. The bill requires CARB to identify high-pollution areas and directs air districts to focus air quality improvement efforts through adoption of community emission reduction programs within these identified areas. Currently, air districts review individual sources and impose emissions limits on emitters based on best available control technology, pollutant type, and proximity to nearby existing land uses. This bill addresses the cumulative and additive nature of air pollutant health effects by requiring community-wide air quality assessment and emission reduction planning.

CARB has adopted diesel exhaust control measures and more stringent emissions standards for various transportation-related mobile sources of emissions, including transit buses, packer trucks, transfer trucks, and off-road diesel equipment (e.g., tractors, generators). Over time, the replacement of older vehicles will result in a vehicle fleet that produces substantially lower levels of TACs than under current conditions. Mobile-source emissions of TACs (e.g., benzene, 1-3-butadiene, diesel PM) have been reduced substantially over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of CARB's Risk Reduction Plan, it is expected that diesel PM concentrations will be 85 percent less in 2020 than they were in 2000 (CARB 2000). Adopted regulations are also expected to continue to reduce formaldehyde emissions emitted by cars and light-duty trucks. As emissions are reduced, it is expected that risks associated with exposure to the emissions will also be reduced.

California has implemented air emissions regulations for landfills under the state's air pollution control authority. The state has established control criteria, collection and control system requirements, testing and reporting requirements, and exemption criteria for MSW landfills. Control criteria include levels of tested air contaminants, average maximum concentrations of total organics over a certain area, and maximum concentration of organic compounds as methane at any location along the landfill surface. These requirements have been incorporated into YSAQMD Rule 2.38, which is discussed further below.

Truck and Bus Regulation

The Truck and Bus Regulation is a key element of both CARB's Diesel Risk Reduction Plan for reducing diesel risk and the SIP for attaining and maintaining the NAAQS. The regulation requires all diesel vehicles with a Gross Vehicle Weight Rating greater than 14,000 pounds (lb) that operate in California to meet model year 2010 emission standards before January 1, 2023 (CARB 2019a:1). This regulation will result in trucks generating less emissions of criteria air pollutants and precursors, as well as diesel PM.

LOCAL

Yolo-Solano County Air Quality Management District

Criteria Air Pollutants

YSAQMD is the primary agency responsible for attaining and maintaining the NAAQS and CAAQS in Yolo County and the norther portion of Solano County. YSAQMD works with other local air districts in the Sacramento region to maintain the region's portion of the SIP for ozone. The SIP is a compilation of plans and regulations that govern how the region and state will comply with the federal Clean Air Act requirements to attain and maintain the NAAQS for ozone. The Sacramento Region has been designated as a "severe" 8-hour ozone nonattainment area with an extended attainment deadline of June 15, 2019. YSAQMD attains and maintains air quality conditions in Yolo and northern Solano counties through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of YSAQMD includes the adoption and enforcement of rules and regulations, and issuance of permits for stationary sources, including landfills. YSAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements other programs and regulations required by the CAA and its amendments and the CCAA.

All projects are subject to adopted YSAQMD rules and regulations in effect at the time of construction. Specific rules applicable to the construction and operation of the project may include but are not limited to the following:

- ► Rule 2.3—(Ringelmann Chart). This rule prohibits stationary diesel-powered equipment from generating visible emissions that would exceed the rule's visibility threshold.
- ► Rule 2.5—(Nuisance). This rule prohibits any source from generating air contaminants or other materials that would that would cause injury, detriment, nuisance, or annoyance to the public; endanger the comfort, repose, health, or safety of the public; or damage businesses or property. Under Rule 2.6, the provisions of Rule 2.5. do not apply to odors emanating from agricultural operations in the growing of crops or raising of fowl, animals, or bees.
- Rule 2.11—(Particulate Matter Concentration). This rule prohibits any source that would emit dust, fumes, or total suspended particulate matter from generated emissions that would exceed the rule's established emission concentration limit.
- Rule 2.14—(Architectural Coatings). This rule establishes volatile organic compound (VOC) content limits for all architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured within YSAQMD's jurisdiction.
- ► Rule 2.28—(Cutback and Emulsified Asphalts). This rule establishes organic compound limits for cutback and emulsified asphalts manufactured, sold, mixed, stored, used, and applied within YSAQMD's jurisdiction.
- Rule 2.38—(Standards for Municipal Solid Waste Landfills). This rule limits the emission of NMOCs from existing MSW landfills and implements the Emission Guidelines for Municipal Solid Waste Landfills as promulgated by the U.S. EPA at 40 Code of Federal Regulations Part 60 Subpart Cc.
- ► Rule 3.1—(General Permit Requirements). This rule establishes permitting processes (i.e., Authority to Construct and Permit to Operate) to review new and modified sources of air pollution.
- ► Rule 3.4—(New Source Review). This rule would require any new or modified stationary source that generates emissions that exceed established emissions limits for each pollutant (i.e., reactive organic gases [ROG], oxides of nitrogen (NO_x), sulfur oxides, PM₁₀, CO, and lead) to comply with best available control technology (BACT) requirements and emissions offset requirements.
- ► Rule 3.8—(Federal Operating Permits). This rule establishes the requirement for facilities to obtain permits associated with requirements under Title V of the CAA. The most common type of Title V source is one that meets YSAQMD's threshold as a "major source." Currently, YSAQMD's thresholds for a major source are:
 - 100 tons per year of any pollutant subject to regulation,
 - 25 tons per year of volatile organic compounds or nitrous oxides,
 - 10 tons per year of any single hazardous air pollutant, and
 - 25 tons per year of two or more hazardous air pollutants.

YSAQMD also issues Emission Reduction Credits (ERCs) to entities to reduce their emissions beyond limits established by YSAQMD, state, or federal requirements. YSAQMD typically only requires ERCs in permit applications with substantial new criteria pollutant emissions. Sources that are required to offset their proposed emissions with ERCs can use their own banked ERCs or purchase them from another ERC holder. Additionally, YSAQMD has developed a set of guidelines for use by lead agencies when preparing impact analyses for California Environmental Quality Act (CEQA) documentation (YSAQMD 2007). The guidelines contain thresholds of significance for criteria pollutants and TACs, and also make recommendations for conducting air quality analyses. After YSAQMD guidelines have been consulted and the air quality impacts of a project have been assessed, the lead agency's analysis undergoes a review by YSAQMD. YSAQMD submits comments and suggestions to the lead agency for incorporation into the environmental document.

Toxic Air Contaminants

At the local level, air districts may adopt and enforce CARB's control measures. Under YSAQMD Rule 3-1 ("General Permit Requirements"), Rule 3-4 ("New Source Review"), and Rule 3-8 ("Federal Operating Permits"), all sources that possess the potential to emit TACs are required to obtain permits from YSAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including the New Source Review standards outlined in Rule 3-4 and air-toxics control measures. YSAQMD limits emissions and public exposure to TACs through many programs. YSAQMD prioritizes the permitting of TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. Sensitive receptors are people, or facilities that generally house people (e.g., schools, hospitals, residences), that may experience adverse effects from unhealthful concentrations of air pollutants.

Sources that require a permit are analyzed by YSAQMD (e.g., health risk assessment [HRA]) based on their potential to emit TACs and expose receptors. If it is determined that a project would emit TACs in excess of YSAQMD's applicable threshold of significance, sources would be required to implement BACT to reduce TAC emissions. If a source cannot reduce the risk below the threshold of significance even after BACT has been implemented, YSAQMD will deny the permit required by the source. This helps to prevent new problems and reduces emissions from existing older sources by requiring them to apply new technology when retrofitting with respect to TACs. Although YSAQMD regulates sources that generate TACs but does not regulate land uses that may be sited in locations exposed to TACs. The decision on whether to approve projects in TAC-exposed locations is typically the responsibility of the lead agency charged with determining whether to approve a project.

<u>Odors</u>

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and YSAQMD. YSAQMD Rule 2.5 (Nuisance) addresses odorous emissions.

Solano County General Plan

The Public Health and Safety Chapter of the County's General Plan (update adopted August 11, 2015) contains goals, policies, and actions that pertain to emissions of air pollutants, TACs, and odors include. Key general plan goals, policies, and implementation programs applicable to the project and air quality include the following:

GOAL HS.G-2. Improve air quality in Solano County, and by doing so; contribute to improved air quality in the region.

GOAL HS.G-4. Protect important agricultural, commercial, and industrial uses in Solano County from encroachment by land uses sensitive to noise and air quality impacts.

- ► Policy HS.P-43. Support land use, transportation management, infrastructure and environmental planning programs that reduce vehicle emissions and improve air quality.
- ▶ Policy HS.P-44. Minimize health impacts from sources of toxic air contaminants, both stationary (e.g., refineries, manufacturing plants) as well as mobile sources (e.g., freeways, rail yards, commercial trucking operations).
- Policy HS.P-45. Promote consistency and cooperation in air quality planning efforts.
 - Implementation Program HS.I-51. Adopt a trip reduction ordinance and encourage employers to develop practices that reduce employees' vehicle trips. Such practices include telecommuting, provision of bicycle facilities, and provision of shuttles to public transit.

- Implementation Program HS.I-52. Require that when development proposals introduce new significant sources of toxic air pollutants, they prepare a health risk assessment as required under the Air Toxics "Hot Spots" Act (AB 2588, 1987) and, based on the results of the assessment, establish appropriate land use buffer zones around those areas posing substantial health risks.
- Implementation Program HS.I-54. Require the implementation of best management practices to reduce air pollutant emissions associated with the construction of all development and infrastructure projects.
- Implementation Program HS.I-56. Comply with the California Air Resources Board and Bay Area or Yolo-Solano Air Quality Management District rules, regulations, and recommendations for Solano County facilities and operations. Such operations shall comply with mandated measures to reduce emissions from fuel consumption, energy consumption, surface coating operations, and solvent usage.
- Implementation Program HS.I-57. Encourage coordination between the Bay Area and Yolo-Solano Air Quality Management Districts for consistency in air quality planning efforts.
- Implementation Program HS.I-59. Assess air quality impacts using the latest version of the California Environmental Quality Act Guidelines and guidelines prepared by the applicable Air Quality Management District.

4.2.2 Environmental Setting

The RHR Landfill is located in an unincorporated area of northern Solano County, the majority of which is within the Sacramento Valley Air Basin (SVAB). The SVAB also includes all of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, and Yuba counties; and the eastern portion of Solano County. The portion of the RHR Landfill property starting at the borrow pit and westward is located within the San Francisco Bay Area Air Basin (SFBAAB). However, because of local climate conditions at the project site, the following environmental setting focuses on the regional conditions of the SVAB, as they are considered most representative of the project site and immediate area.

The ambient concentrations of air pollutant emissions are determined by the amount of emissions released by the sources of air pollutants and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources, as discussed separately below.

CLIMATE, METEOROLOGY, AND TOPOGRAPHY

The SVAB is a relatively flat area bordered by the north Coast Ranges to the west and the northern Sierra Nevada to the east. Air flows into the SVAB through the Carquinez Strait, the only breach in the western mountain barrier, and moves across the Sacramento–San Joaquin Delta (Delta) from the San Francisco Bay area.

The Mediterranean climate type of the SVAB is characterized by hot, dry summers and cool, rainy winters. During the summer, daily temperatures range from 50 degrees Fahrenheit (°F) to more than 100°F. The inland location and surrounding mountains shelter the area from most of the ocean breezes that keep the coastal regions moderate in temperature. Most precipitation in the area results from air masses that move in from the Pacific Ocean, usually from the west or northwest, during the winter months. More than half the total annual precipitation falls during the winter rainy season (November through February); the average winter temperature is a moderate 49°F. Also, characteristic of SVAB winters are periods of dense and persistent low-level fog, which are most prevalent between storms. The prevailing winds are moderate in speed and vary from moisture-laden breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which entraps air pollutants when meteorological conditions are unfavorable for transport and dilution. Poor air movement is most frequent in the fall and winter when high-pressure cells are present over the SVAB. The lack of surface wind during these periods, combined with the reduced vertical flow caused by a decline in surface heating, reduces the influx of air and leads to the concentration of air pollutants under stable meteorological conditions. Surface concentrations of air pollutant emissions are highest when these conditions occur in combination with agricultural burning activities or with temperature inversions, which hamper dispersion by creating a ceiling over the area and trapping air pollutants near the ground.

Elevated levels of ozone typically occur May through October in the SVAB. This period is characterized by poor air movement in the mornings until the arrival of the Delta sea breeze from the southwest in the afternoons. In addition, longer daylight hours provide a plentiful amount of sunlight to fuel photochemical reactions between ROG and NO_X, which result in ozone formation. Typically, the Delta breeze transports air pollutants northward out of the SVAB; however, a phenomenon known as the Schultz Eddy prevents this from occurring during approximately half of the time from July to September. The Schultz Eddy phenomenon causes the wind to shift southward and blow air pollutants back into the SVAB. This phenomenon exacerbates the concentration of air pollutant emissions in the area and contributes to the area violating the ambient air quality standards.

The local meteorology of the project site and surrounding area is represented by measurements recorded at the Solano County "Vacaville" weather station located in Vacaville, California. The normal annual precipitation is approximately 24.6 inches. January temperatures range from a normal minimum of 36.7°F to a normal maximum of 55.4°F. July temperatures range from a normal minimum of 56.1°F to a normal maximum of 95.2°F (WRCC 2019a). The predominant wind direction and speed, measured at the Vacaville Airport (KVCB), is from the south-southwest (SSW) at 6 miles per hour (WRCC 2019b & 2019c).

CRITERIA AIR POLLUTANTS

Concentrations of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, PM₁₀, PM_{2.5}, and lead are used as indicators of ambient air quality conditions and are referred to as criteria air pollutants. Criteria air pollutants are air pollutants for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set by EPA and CARB. Additional information, including future trends and monitoring data at those monitoring stations located closest to the project site, is summarized in Table 4.2-2.

Pollutant	Sources	Acute ¹ Health Effects	Chronic ² Health Effects
Ozone	Secondary pollutant resulting from reaction of ROG and NO _X in presence of sunlight. ROG emissions result from incomplete combustion and evaporation of chemical solvents and fuels; NO _X results from the combustion of fuels	increased respiration and pulmonary resistance; cough, pain, shortness of breath, lung inflammation	permeability of respiratory epithelia, possibility of permanent lung impairment
Carbon monoxide	Incomplete combustion of fuels; motor vehicle exhaust	headache, dizziness, fatigue, nausea, vomiting, death	permanent heart and brain damage
Nitrogen dioxide	combustion devices; e.g., boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines	coughing, difficulty breathing, vomiting, headache, eye irritation, chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat, death	chronic bronchitis, decreased lung function
Sulfur dioxide	coal and oil combustion, steel mills, refineries, and pulp and paper mills	Irritation of upper respiratory tract, increased asthma symptoms	Insufficient evidence linking sulfur dioxide exposure to chronic health impacts

Table 4.2-2	Sources and Health Effects of Criteria Air Pollutants
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Pollutant	Sources	Acute ¹ Health Effects	Chronic ² Health Effects
Respirable particulate matter and Fine particulate matter	fugitive dust, soot, smoke, mobile and stationary sources, construction, fires and natural windblown dust, and formation in the atmosphere by condensation and/or transformation of sulfur dioxide and ROG	breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	alterations to the immune system, carcinogenesis
Lead	metal processing	reproductive/developmental effects (fetuses and children)	numerous effects including neurological, endocrine, and cardiovascular effects

Notes: NO_X = oxides of nitrogen; ROG = reactive organic gases.

^{1.} "Acute" refers to effects of short-term exposures to criteria air pollutants, usually at relatively high concentrations.

^{2.} "Chronic" refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.

Sources: EPA 2018; Godish 2004:169-70

Attainment Designations

The air quality of the SVAB is determined by routinely monitoring changes in the quantities of criteria pollutants in the ambient environment. Air quality in the area is a function of the criteria pollutants emitted locally, the existing regional ambient air quality, and the meteorological and topographic factors, which influence the intrusion of pollutants into the area from sources outside the immediate vicinity.

CARB, YSAQMD, and other air districts in the Sacramento region maintain ambient air quality monitoring stations at numerous locations throughout the SVAB. The stations provide information on average concentrations of criteria air pollutants. These data are measured against the NAAQS and CAAAQS established by EPA and CARB to protect human health and welfare. Geographic areas are designated "attainment" if these standards are met and "nonattainment" if they are not met. "Unclassified" is used in an area that cannot be classified based on available information as meeting or not meeting the standards.

Solano County is designated as nonattainment with respect to the NAAQS and CAAQS for ozone (CARB 2017a) and the northern portion of Solano County, including the project site, is part of the Sacramento Federal Nonattainment Area (SMAQMD n.d.). Solano County is also designated as nonattainment with respect to the NAAQS for PM_{2.5} and nonattainment with respect to the CAAQS for PM₁₀. Solano is designated as attainment or unclassified with respect to the NAAQS and CAAQS for all other criteria air pollutants (CARB 2017a).

Criteria air pollutants and precursors emitted by existing operations at the landfill include ROG, NO_X, PM₁₀, PM_{2.5}, and SO_X (SCS Engineers 2019:42, 48).

TOXIC AIR CONTAMINANTS

The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being diesel PM (CARB 2005:12; CARB 2000:15). Diesel PM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances (CARB 2013:2-4). Although diesel PM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emissions control system is being used. Unlike the other TACs, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. However, CARB has made preliminary concentration estimates based on a PM exposure method. This method uses the CARB emissions inventory's PM₁₀ database, ambient PM₁₀ monitoring data, and the results from several studies to estimate concentrations of diesel PM. In addition to diesel PM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene. Diesel PM poses the greatest health risk among these 10 TACs mentioned (CARB 2000:16).

Based upon data from other landfills, TAC constituents in LFG typically consist of benzene, chloroform, methylene chloride, perchloroethylene (PCE), trichloroethylene (TCE), vinyl chloride (VC), and others. At the existing landfill, TACs are associated with current equipment operations, as well as LFG facilities, including flaring. A health risk assessment prepared for the landfill in 2012 indicates that it emits 25 different TACs (Douglas Environmental 2012: Table 3-3). Diesel trucks traveling to and from the landfill are sources of diesel PM, as are heavy equipment used at the landfill.

ODORS

The existing landfill and composting operation are the subject of multiple odor complaints received by the Solano County Department of Resource Management. County staff investigate as many complaints as possible to determine whether an adverse odor is present and the source of the odor. According to the most recent Odor Management and Compliance Reports, since 2015 the Solano County Department of Resource Management has verified one odor complaint resulting in a Notice of Violation (NOV), and three complaints resulting in an Area of Concern (AOC) determination. All verified odor complaints have been attributed to operations at the Jepson Prairie Organics (JPO) composting facility. Condition 12C of Land Use Permit No. U-11-09 for Recology and JPO requires submission of an annual Odor Management Compliance Report that details odor sources and sensitive receptors, a list of complaints and violations including descriptions of their resolutions, and a description of odor control strategies that have been implemented or proposed. These reports are reviewed every two years by the Solano County Department of Resource Management (Solano County 2017, 2019).

In 2014, the design of the engineered compost system at JPO was modified to help reduce odors. HDPE perforated collection pipes were installed in the compost vaults, the tarps previously used to cover the compost piles were replaced with a biocover, and an additional biofilter and blower were installed. These modifications increased air flow through the compost zones, reducing the intensity of onsite odors.

The Solano County Department of Resource Management Local Enforcement Agency (LEA) investigates all odor complaints in coordination with JPO. LEA and JPO investigators meet with the complainant at their residence to determine whether the odor complaint and the reported odors can be confirmed. If no odors are detectable, the complaint is deemed unverified. If an odor is present, the investigators will quantify the odor intensity utilizing an olfactory meter. Of the 135 complaints received between September 2015 and May 2017, one Notice of Violation (NOV) and three Area of Concern (AOC) designations were issued. From October 2017 to May 2019, there were 32 odor complaints received, and no NOVs or AOCs were issued. None of the complaints were verified, and thus no LEA action was required.

SENSITIVE LAND USES

Sensitive receptors are generally considered to include those land uses where exposure to pollutants could result in healthrelated risks to sensitive individuals. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public.

Three rural residences are located within a 2-mile radius of the landfill. Two of the residences are located approximately 1.5 miles west of the landfill. One residence is located approximately 1.25 miles south of the landfill and one residence is located approximately 1.0 mile north of the landfill. There are no schools, childcare centers, hospitals, or senior centers located within 2.0 miles of the landfill.

The routes used by haul trucks traveling to and from the landfill, which are shown in Figure 3-1, pass by multiple residential dwellings. Also, there is a childcare center located on the east side of the segment of Lewis Road north of Hay Road, which is one of the routes used by trucks traveling to and from the landfill.

4.2.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

For the purposes of this Subsequent Environmental Impact Report (SEIR), impacts related to air quality emissions are considered significant if the proposed project would:

- conflict with or obstruct implementation of the applicable air quality plan;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable NAAQS or CAAQS;
- ► expose sensitive receptors to substantial pollutant concentrations; or
- ▶ result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality district may be relied upon to make the above determinations. Thus, according to guidance from YSAQMD, the project would result in a significant impact to air quality if it would result in the following during either short-term construction or long-term operation:

result in emissions of criteria air pollutants or precursors to exceed 10 tons per year (tons/year) for ROG, 10 tons/year for NO_X, 80 pounds per day (lb./day) of PM₁₀, or substantially contribute to CO concentrations that exceed the CAAQS (YSAQMD 2007:6).

However, these mass emission thresholds for criteria air pollutants and precursors do not apply to emissions directly generated by stationary sources, including the increase in emissions in landfill gas and emissions generated by the Construction and Demolition Sorting Operation. In its CEQA guidance, YSAQMD states that "stationary sources complying with applicable [YSAQMD] regulations pertaining to Best Available Control Technologies (BACT) and offset requirements usually will not be considered a significant air quality impact. This qualification does not exempt projects with any special circumstances such as emitting objectionable odors that cause a nuisance to nearby receptors, having significant cumulative effects, or emissions associated with construction of the stationary source" (YSAQMD 2007:20).

Also, some of the project-generated vehicle trips would travel in the San Francisco Bay Area Air Basin (SFBAAB), which is under the jurisdiction of BAAQMD and the emissions-generating activity in the SFBAAB would be subject to BAAQMD's CEQA guidance. According to guidance from BAAQMD, operation of the project, including project-related vehicle trips, would result in a significant impact to air quality if it would:

► result in average daily operational emissions of ROG, NO_X, or PM_{2.5} that exceeds 54 lb./day; average daily emissions of PM₁₀ that exceeds 82 lb./day; annual emissions of ROG, NO_X, or PM_{2.5} that exceeds 10 tons/year; or annual emissions of PM₁₀ that exceeds 15 tons/year (BAAQMD 2017:2-2).

For the evaluation of TAC emissions, YSAQMD considers proposed projects that have the potential to expose the public to TACs from stationary sources in excess of the following thresholds to have a significant impact. These thresholds are based on YSAQMD's Risk Management Policy (YSAQMD 2007:7).

- Probability of contracting cancer for the Maximally Exposed Individual (MEI) equals to 10 in one million or more; and/or
- Ground-level concentrations of non-carcinogenic TACs would result in a hazard index equal to or greater than 1 for the MEI.

Because YSAQMD has not developed thresholds of significance for evaluating the exposure of sensitive receptors to mobile-source TACs, Solano County and its consultants are choosing, for this SEIR, to apply these same incremental increase thresholds to evaluate the impact of diesel PM generated by truck trips associated with the project and the exposure of diesel PM to residential land uses located along the roadway on which these trips would travel. This

approach aligns with General Plan Goal HS.P-44, which calls for the minimization of health impacts from both stationary and mobile sources of TACs. It also aligns with goal HS.I-52, which requires that when development proposals introduce new significant sources of TACs, they prepare a health risk assessment. BAAQMD recommends the same incremental increase thresholds and does so for both stationary sources and mobile sources (BAAQMD 2017:2-2).

For the evaluation of odorous emissions, YSAQMD considers there to be a significant impact of a project causes odorous emissions in such quantities as to cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or safety of any such person or the public, or which may endanger to cause, injury or damage to business or property (YSAQMD 2007:8).

On a cumulative basis, YSAQMD finds that any exceedance of project-level thresholds would also result in a significant cumulative impact. In addition, YSAQMD considers combined CO impacts from the project and other existing projects (i.e., background concentration) that exceed air quality standards as cumulatively considerable.

METHODOLOGY

Evaluation of the project's impacts to air quality were based on an Air Quality Impact Assessment prepared by SCS Engineers (SCS Engineers 2019), supplemental calculations, and a health risk analysis. The Air Quality Impact Assessment is provided in Appendix D. The supplemental emissions calculations are provided in Appendix E. And the health risk calculations are provided in Appendix F. The methods of analysis are consistent with recommendations of the Yolo-Solano Air Quality Management District (YSAQMD), Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (CARB), and U.S. Environmental Protection Agency (EPA).

Regional and local criteria air pollutant emissions and associated impacts, as well as impacts from TACs, CO concentrations, and odors were assessed in accordance with YSAQMD-recommended methodologies, where available.

Construction-Related Emissions Criteria Pollutant Emissions

Short-term construction-related emissions of criteria air pollutants and precursors were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 computer program (CAPCOA 2016). CalEEMod was used to calculate emissions generated during the construction phase of the project. Modeling was based on project-specific information (e.g., schedule, are of disturbance), where available, and default values in CalEEMod that are based on the project's location, land use type, and type of construction activity. Specific CalEEMod modeling inputs and assumptions can be found the Air Quality Impact Assessment in Appendix D.

Operational Emissions of Criteria Air Pollutants and Precursors

Stationary-source emissions from the landfill are not analyzed further in this SEIR because they would be subject to YSAQMD's permitting requirements. Per YSAQMD's CEQA guidance, stationary sources complying with applicable District regulations pertaining to BACT and offset requirements are not considered a significant air quality impact (YSAQMD 2007:20).

Operational mobile-source emissions of criteria air pollutants and precursors were estimated using project-specific information, where available, and default values in CARB's Emission Factor Web Database, version 1.0.2 (EMFAC2017) (CARB 2017b) based on the project's location and land use characteristics. Mobile-source emissions were estimated using the number of project-generated vehicle trips provided by the traffic analysis used to support Section 4.11, "Transportation and Circulation" (KD Anderson 2018:14), which is provided in Appendix G of this Draft SEIR. Operational emissions from all sources were estimated, and detailed model assumptions and inputs for these calculations can be found in Appendix E.

Toxic Air Contaminants and Related Health Risk

Construction-generated TACs were qualitatively analyzed based on the types of diesel-powered construction equipment and the number of each type that would be used, the duration in which construction activity would produce diesel PM exhaust in the same location, the size of the area in which construction activity would occur, and the proximity of construction activity to offsite sensitive receptors.

TACs emitted by long-term operations at the landfill were also evaluated qualitatively based on the types of TACemitting activities that would take place at the landfill. This analysis accounts for the daily use of diesel PM–emitting heavy equipment and TACs generated by the landfill itself relative to existing conditions, as well as the applicable permitting requirements of YSAQMD, and the distance to the nearest offsite sensitive receptors.

A quantitative analysis was conducted to address the potential health risk that would result from the increase in project-related diesel truck trips on local roadways that would pass by existing residential land uses. A health risk assessment (HRA) was conducted using the CARB-approved American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee modeling system (AERMOD), Version 18081 (EPA 2018) with the graphical user interface, AERMOD View, Version 9.7.0 (Lakes Environmental 2019). Cancer risk levels at offsite receptors were estimated using the risk module of CARB's Hotspots Analysis Reporting Program, Version 2 (HARP2) (CARB 2019b). AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources and terrain. All modeling was conducted according to guidance published by the Office of Environmental Health Hazard Assessment (OEHHA) (OEHHA 2015) and guidance published by the San Joaguin Valley Air Pollution Control District (SJVAPCD 2006) in consultation with YSAQMD staff. The AERMOD modeling estimated diesel PM concentrations at residential land uses located along the haul routes. Source inputs included the local routes used by project-related truck trips, which were modeled as line sources. The volume of truck trips using each haul route is based on the same data used to prepare the traffic impact analysis for the project (KD Anderson 2018), which is provided in Appendix G. Emissions rates for truck-generated diesel PM were estimated using emission factors in the EMFAC2017 model (CARB 2017b) and account for the expected decrease in emissions over a 30-year exposure period (i.e., 2020–2049) due to ongoing compliance with CARB's Truck and Bus Regulation. Computation of the emission rates is provided in Appendix E. The cancer risk associated with exposure to these concentrations and the duration of exposure were determined using YSAQMD-approved methods. Refer to Appendix F for detailed model input assumptions and output results. Cancer risk is the primary concern for exposure to diesel PM because it is substantially greater than non-cancer chronic and acute risks.

Odors

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals can smell very minute quantities of specific substances; others may not have the same sensitivity to odors in general; and still others may not be sensitive to a specific substance but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant or coffee roaster). It is important to also note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

The assessment of odor-related impacts was based on the types of odor sources associated with the project, the degree of change compared to existing conditions, and the project's location relative to existing offsite sensitive receptors.

ISSUES NOT DISCUSSED FURTHER

The proposed project would increase the number of transfer trucks, packer trucks, and self-haul vehicles travelling to and from the project site. However, the traffic impact analysis (Appendix G of this Draft SEIR) determined that, under existing-plus-project conditions, the peak-hour level of service at affected intersections would operate at an acceptable level of service (i.e., Level of Service C or better) (KD Anderson 2018:19–20). According to screening criteria recommended by YSAQMD, mobile sources do not have the potential to generate CO concentrations that exceed the NAAQS or CAAQS for CO at intersections with an unacceptable level of service (i.e., level of service E or F) (YSAQMD 2007:10–11). Therefore, localized CO impacts would not occur at an of the study intersections and CO concentrations are not discussed further.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.2-1: Construction-Related Emissions of Criteria Air Pollutants and Precursors

Project construction would generate emissions of ROG, NO_X, PM₁₀, and PM_{2.5}. from grading, excavation, and installation of the geomembrane. Emissions would be generated by heavy-duty, off-road equipment and by worker commute trips and trucks hauling materials and equipment to the site. However, construction activities would not generate emissions of ROG, NO_X, and PM₁₀ that would exceed YSAQMD-recommended mass emission thresholds. Therefore, construction-generated emissions of criteria air pollutants and precursors would not conflict with the air quality planning efforts in the region or contribute substantially to the nonattainment status of SVAB with respect to the NAAQS and CAAQS for ozone, the CAAQS for PM₁₀, or the NAAQS for PM_{2.5}. Thus, emissions generated during the project's construction would not contribute to air quality–related health complications experienced by people living in the SVAB. This impact would be **less than significant**.

Construction-related activities would generate emissions of ROG, NO_X, PM₁₀, and PM_{2.5} from off-road equipment used for grading, excavation, and installation of the geomembrane; on-road trucks used for material delivery and equipment hauling; and worker commute trips. Fugitive dust PM₁₀ and PM_{2.5} emissions would be associated primarily with ground disturbance and vary as a function of soil silt content, soil moisture, wind speed, and acreage of disturbance. PM₁₀ and PM_{2.5} would also be contained in exhaust from off-road equipment and on-road vehicles. Emissions of ozone precursors, ROG and NO_X, would be associated primarily with the exhaust generated by off-road equipment and on-road vehicles.

Emissions were estimated using the construction module of CalEEMod (CAPCOA 2016) and are summarized in Table 4.2-3. Construction is anticipated to begin in 2020 and last approximately 2 years. The modeling of construction emissions conservatively assumed that all of the construction would be completed in 2020. Detailed modeling assumptions and input parameters are provided in Appendix D.

	ROG	NO _X	PM ₁₀	PM _{2.5}	
units	tons/year	tons/year	lb./day	lb./day	
Construction-Generated Emissions	0.7	7.8	54.4	11.3	
YSAMQD Threshold of Significance	10	10	80	1	

Table 4.2-3 Summary of Construction-Related Emissions of Criteria Air Pollutants and Precursors

Notes: ROG=reactive organic gases; NO_x=oxides of nitrogen; PM₁₀=respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PM_{2.5}=respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; tons/year=tons per year; lb./day=pounds per day; YSAQMD=Yolo County Air Quality Management District

See Appendix D for detailed inputs and modeling results.

¹ YSAQMD does not recommend mass emission-based significance criteria for PM_{2.5}. PM_{2.5} is shown for informational purposes.

Source: Modeling conducted by Trinity Consultants and compiled by SCS Engineers 2019.

As shown in Table 4.2-3, construction activities would not generate emissions of ROG, NO_X, and PM₁₀ that would exceed YSAQMD-recommended mass emission thresholds. Therefore, construction-generated emissions of criteria air pollutants and precursors would not conflict with the air quality planning efforts in the region or contribute substantially to the nonattainment status of SVAB with respect to the NAAQS and CAAQS for ozone, the CAAQS for PM₁₀, or the NAAQS for PM_{2.5}. Thus, emissions generated during the project's construction would not contribute to air quality–related health complications experienced by people living in the SVAB. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.2-2: Long-Term Operational Emissions of Criteria Air Pollutants and Precursors

The increase in project-related truck travel would generate levels of NO_X in the SFBAAB that exceed BAAQMDrecommended daily mass emission thresholds. Therefore, operational emissions could conflict with the air quality planning efforts in the SFBAAB or contribute substantially to the nonattainment status of SFBAAB with respect to the NAAQS and CAAQS for ozone and the project's operational emissions could contribute to air quality–related health complications experienced by people living in the SFBAAB. This would be a **significant** impact.

Stationary-source emissions from the landfill are not analyzed further in this SEIR because they would be subject to YSAQMD's permitting requirements and, per YSAQMD's CEQA guidance, stationary sources complying with applicable District regulations pertaining to BACT and offset requirements are not considered a significant impact to air quality (YSAQMD 2007:20).

Nonetheless, expansion of the landfill and the increase in the rate of waste brought to the land fill would result in an increase in operational emissions of criteria air pollutants and precursors contained in landfill gas emitted by the landfill. Emissions of criteria air pollutants and precursors would also increase due to modification of the Construction and Demolition Sorting Operation, which would involve the use of diesel generator and other stationary equipment. Emission levels from these stationary sources were estimated in the Air Quality Impact Assessment prepared by SCS Engineers (SCS Engineers 2019) and included in Appendix D. Because these new stationary sources would comply with applicable YSAQMD regulations pertaining to BACT and offset requirements they would not be considered to be in conflict with air quality planning efforts in the SVAB or to contribute substantially to the existing nonattainment status of the SVAAB with respect to the NAAQS and CAAQS for ozone, the NAAQS for PM_{2.5}, or the CAAQS for PM₁₀.

However, the 780-ton-per-day increase in average daily throughput associated with the project would also result in approximately 195 additional round trips per day by haul trucks, as explained in the traffic impact analysis prepared for the project (KD Anderson 2018:13), and emissions from this truck activity would not be subject to permitting requirements of YSAQMD or BAAQMD. Table 4.2-4 summarizes the average daily and annual emissions of criteria air pollutants and precursors that would be generated by this increase in truck travel in 2020, which is the earliest year in which the project could become fully operational. Emissions were calculated using EMFAC2017 and detailed modeling parameter are included in Appendix E.

	Tons per Year			Pounds per Day				
	ROG	NOx	PM ₁₀	PM _{2.5}	ROG	NOx	PM ₁₀	PM _{2.5}
Emissions in SVAB	<0.1	1.7	<0.1	<0.1	0.1	9.3	0.2	0.1
YSAMQD Threshold of Significance	10	10	—	1	—	—	80	1
Emissions in SFBAAB	0.7	20.3	0.9	0.6	3.9	111	5.0	3.1
BAAQMD Threshold of Significance	10	10	15	10	54	54	82	54

Table 4.2-4	Operational Mobile-Source Emissions of Criteria Air Pollutants and Precursors in 2020

Notes: SVAB = Sacramento Valley Air Basin; SFBAAB = San Francisco Bay Area Air Basin; ROG=reactive organic gases; NO_x=oxides of nitrogen; PM₁₀=respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PM_{2.5}=respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; YSAQMD=Yolo County Air Quality Management District

See Appendix E for detailed inputs and modeling results.

¹ YSAQMD does not recommend mass emission-based significance criteria for PM_{2.5}. PM_{2.5} is shown for informational purposes.

Source: Ascent Environmental 2019.

As shown in Table 4.2-4, in 2020, operational emissions of NO_x in the SFBAAB would exceed the BAAQMDrecommended mass emission thresholds of 54 lb./day for average daily emissions and 10 tons/year for annual emissions. However, emissions from trucks are anticipated to decrease due to the requirements of the Truck and Bus Regulation. As described in Section 4.2.2, "Environmental Setting," this regulation requires all diesel vehicles with a Gross Vehicle Weight Rating greater than 14,000 pounds to meet model year 2010 emission standards before January 1, 2023, resulting in less emissions of criteria air pollutants and precursors (CARB 2019a:1). Table 4.2-5 summarizes the average daily and annual emissions of criteria air pollutants and precursors that would be generated by this increase in truck travel in 2023, which is the earliest year when full compliance with CARB's Truck and Bus Regulation would be achieved. Emissions were calculated using EMFAC2017 and detailed modeling parameter are included in Appendix E. EMFAC2017 estimates emission rates for all vehicle types in future calendar years and accounts for full compliance with the Truck and Bus Regulation by January 1, 2023 (CARB 2018:17–18, 54–58, 64–65, 67).

	Tons per Year		Pounds per Day					
	ROG	NO _X	PM ₁₀	PM _{2.5}	ROG	NO _X	PM ₁₀	PM _{2.5}
Emissions in SVAB	<0.1	1.4	<0.1	<0.1	0.1	7.7	0.2	0.1
YSAMQD Threshold of Significance	10	10	_	1	_	_	80	1
Emissions in SFBAAB	0.1	8.9	0.6	0.3	0.5	49.0	5.0	1.5
BAAQMD Threshold of Significance	10	10	15	10	54	54	82	54

Table 4.2-5	Operational Mobile-Source Emissions of Criteria Air Pollutants and Precursors in 2023
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Notes: SVAB = Sacramento Valley Air Basin; SFBAAB = San Francisco Bay Area Air Basin; ROG=reactive organic gases; NOx=oxides of nitrogen; PM₁₀=respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PM_{2.5}=respirable particulate matter with an aerodynamic diameter of 2.5 micrometers or less; YSAQMD=Yolo County Air Quality Management District

See Appendix E for detailed inputs and modeling results.

¹ YSAQMD does not recommend mass emission-based significance criteria for PM_{2.5}. PM_{2.5} is shown for informational purposes.

Source: Ascent Environmental 2019.

As shown in Table 4.2-5, project-related truck travel would not generate levels of NO_X, or other criteria air pollutants or precursors that exceed air district thresholds.

Nonetheless, because project-related truck travel in the SFBAAB would generate levels of NO_X that exceed BAAQMD's mass emission threshold, and because NO_X is a precursor to ozone, this increase could conflict with the air quality planning efforts in the region or contribute substantially to the nonattainment status of SFBAAB with respect to the NAAQS and CAAQS for ozone until 2023 when trucks all trucks achieve compliance with CARB's Truck and Bus Regulation. Before 2023, the project's operational emissions of NO_X could contribute to air quality–related health complications experienced by people living in the SFBAAB. This would be a **significant** impact.

Mitigation Measures

Mitigation Measure 4.2-2: Ensure Truck-Generated Emissions of NO_X in the San Francisco Bay Area Air Basin Will Not Exceed BAAQMD-recommended Mass Emission Criteria

The applicant shall demonstrate compliance with one or a combination of the following mitigation options to ensure that the level of NO_X emissions in the SFBAAB associated with project-related truck trips does not exceed BAAQMD's recommended significance criteria of 54 lb/day and 10 tons/year. Within 60 days of use permit approval, the applicant shall submit to the Planning Services Division of the Department of Resource Management, a detailed action plan that demonstrates implementation of this measure.

Option A. Achieve Early Compliance with the Truck and Bus Regulation., the applicant shall retrofit and/or upgrade its fleet of trucks to fully comply with CARB's Truck and Bus Regulation prior to increasing average daily throughput at RHR landfill and before January 1, 2023, which is the date by which all trucks are required to comply with the emissions standards imposed by the Truck and Bus Regulation. The action plan submitted for this mitigation measure shall include an inventory of the vehicles to be retrofitted or upgraded and may include a phased approach. After January 1, 2023, Recology shall contract with haulers that are compliant and certified with CARB's Truck and Bus Regulations.

- Option B. Pay an Offset Fee to a Third-Party to Fund NO_x Emissions Offsets. The applicant shall purchase and retire NO_x offset credits sufficient to offset NO_x emissions in the SFBAAB at a rate of 57 lb/day and 10.3 tons/year from to a third-party non-profit (e.g., Bay Area Clean Air Foundation) or governmental entity prior to the receiving an increase in truck trips greater than the limits identified in Option B. The NO_x emission offset credits must be used to fund a NO_x reduction project in the SFBAAB. The cost of the credits, as well as any related administrative costs, shall be paid by the applicant. The applicant shall provide to the county the agreement that specifies the payment fee, timing of payment, and offset mechanism. This agreement must be signed by the applicant and the third-party entity. The specific emissions reduction project must result in emission reductions within the SFBAAB that are real, surplus, quantifiable, and enforceable and would not otherwise be achieved through compliance with existing regulatory requirements or any other legal requirement. The cost of implementing the selected measures shall be fully funded by the applicant. The NO_x project or program that would be implemented to offset NO_x must be approved by BAAQMD. The applicant shall provide proof to the county that the offsets are approved by BAAQMD and have been fully funded by the applicant. This option can only be implemented if NO_x offset credits are available at the time they are needed.
- Option C: Use Renewable Diesel Fuel in All Diesel Trucks Operated by the Applicant. The applicant shall use only renewable diesel (RD) fuels in all diesel-powered trucks uses to haul materials to the landfill and the Construction and Demolition Sorting Operation. This measure applies to diesel trucks operated or contracted by the applicant. RD fuel must meet the following criteria:
 - meet California's Low Carbon Fuel Standards and be certified by CARB Executive Officer;
 - be hydrogenation-derived (reaction with hydrogen at high temperatures) from 100 percent biomass material (i.e., non-petroleum sources), such as animal fats and vegetables;
 - contain no fatty acids or functionalized fatty acid esters; and
 - have a chemical structure that is identical to petroleum-based diesel and complies with American Society for Testing and Materials D975 requirements for diesel fuels to ensure compatibility with all existing diesel engines.

The use of RD in trucks is estimated to reduce NO_X emissions by approximately 14 percent compared to conventional diesel fuel (SMAQMD 2015:3).

Significance after Mitigation

Implementation of Mitigation Measure 4.2-2 would ensure that the project-related increase in truck-generated emissions of NO_X in the SFBAAB would not exceed BAAQMD's recommended threshold of 54 lb/day or 10 tons/year. This could be achieved through implementation of one or more of the options (i.e., Option A, B, and/or C) listed under Mitigation Measure 4.2-2. With implementation of the mitigation measure, this impact would be reduced to a less-than-significant level.

Impact 4.2-3: Exposure of Offsite Sensitive Receptors to Toxic Air Contaminants

Emissions of TACs associated with implementation of the project, including diesel PM emitted by heavy construction equipment, TACs contained in LFG, and diesel PM generated by haul trucks traveling on area roadways, would not result in an incremental increase in cancer risk greater than 10 in one million or a hazard index of 1.0 or greater at any offsite sensitive receptors. Therefore, this impact would be **less than significant**.

The exposure of offsite sensitive receptors to health risk associated with TACs generated during project construction, TACs contained in landfill gas, and diesel PM emitted by haul trucks traveling to and from the project site are discussed separately below.

Construction-Generated Emissions of Toxic Air Contaminants

Construction-related activities would result in temporary, intermittent emissions of diesel PM from the exhaust of heavy-duty off-road diesel equipment used for grading, excavation, and installation of the geomembrane and on-road trucks used for material delivery and equipment hauling. On-road, diesel-powered haul trucks traveling to and

from the construction area to deliver materials and equipment are less of a concern because they do not operate at a single location for extended periods and therefore would not expose a single receptor to excessive diesel PM emissions.

The potential cancer risk from inhaling diesel PM outweighs the potential for all other diesel PM–related health impacts (i.e., non-cancer chronic risk, short-term acute risk) (CARB 2003:K-1). As indicated by the CalEEMod run for project construction in Appendix D (i.e., Appendix A to the Air Quality Impact Assessment), maximum daily exhaust emissions of PM₁₀, which is considered a surrogate for diesel PM, could reach up to 6 lb./day during construction.

The dose of a TAC to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC levels that exceed applicable standards). Dose is a function of the concentration of a substance in the environment and the duration of exposure to the substance. It is positively correlated with time, meaning that a longer exposure period would result in a higher risk exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if the exposure occurs over a longer period. According to OEHHA, health risk assessments, which determine the exposure of sensitive receptors to TACs, should be based on a 70- or 30-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the project (OEHHA 2015:5-23, 5-24). For this reason, it is important to consider that the use of heavy-duty off-road diesel equipment would be limited to the summers of 2020 and 2021, when the expansion area would be constructed.

In addition, studies show that diesel PM is highly dispersive and that concentrations of diesel PM decline with distance from the source (e.g., 500 feet from a freeway, the concentration of diesel PM decreases by 70 percent) (Roorda-Knape et al. 1999; Zhu et al. 2002, cited in CARB 2005:9). As noted above, the nearest offsite sensitive receptor, a single-family residence, is located approximately 1.0 mile north of the landfill.

Therefore, considering the highly dispersive properties of diesel PM, the relatively low mass of diesel PM emissions that would be generated during project construction, and the relatively short period during which diesel PM–emitting construction activity would take place, construction-related TACs would not expose sensitive receptors to an incremental increase in cancer risk that exceeds 10 in one million or a hazard index of 1.0 or greater.

Landfill-Generated Emissions of Toxic Air Contaminants

TACs contained in LFG emitted by the landfill and LFG control devices include benzene, vinyl chloride, and heavy metals (such as mercury). With the expansion of the landfill and the increase in average daily throughput, the quantity of LFG emitted by the landfill may increase (SCS Engineers 2019:5). The increase in project-related TACs that would be contained in LFG is addressed in the Air Quality Impact Assessment prepared for the project (SCS Engineers 2019) and provided in Appendix D (See Appendices C and D of the Air Quality Impact Assessment located in Appendix D of this Draft SEIR) Under YSAQMD Rule 3.1, "General Permit Requirements," Rule 3.4, "New Source Review," and Rule 3.8, "Federal Operating Permit," all sources with the potential to emit TACs are required to obtain permits from YSAQMD. Permits may be granted to these operations if they are constructed and operated in accordance with applicable regulations, including New Source Review standards and air toxics control measures. YSAQMD will not permit the project, or construction of any stationary source or modification to an existing stationary source, if it would result in an incremental increase in cancer greater than 10 in one million or the or a hazard index equal to or greater than 1 at an offsite receptor.

Truck-Generated Emissions of Toxic Air Contaminants

The projected increase in average daily throughput associated with the project would result in approximately 195 additional round trips per day by haul trucks, as explained in the traffic impact analysis prepared for the project (KD Anderson 2018:13). YSAQMD has no permitting or other regulatory authority over on-road motor vehicle activity. The routes used by haul trucks traveling to and from the landfill are shown in Figure 3-5 of this Draft SEIR. These haul trips would be conducted by transfer trucks, packer trucks, and self-haul vehicles. All the transfer trucks and packer trucks would be powered by diesel engines and therefore emit diesel PM. It is assumed that all of the self-haul vehicles would also emit diesel PM. Cancer risk is the primary concern for exposure to diesel PM because it is substantially greater than non-cancer chronic and acute risk. Refer to Appendix F for detailed input assumptions used in AERMOD and HARP2 and output results.

The health risk analysis determined that the highest incremental increase in cancer risk at receptors along the landfill's haul routes resulting from project-related truck travel would be 7.8 in one million. This incremental increase in cancer risk exposure would occur approximately 70 feet north of the intersection of Midway Road and Lewis Road. Therefore, diesel PM emitted by project-related truck travel would not result in an incremental increase greater in cancer risk at any residences or other sensitive receptors greater than 10 in one million.

Summary

In summary, emissions of TACs associated with implementation of the project, including diesel PM emitted by heavy construction equipment, TACs contained in LFG, and diesel PM generated by haul trucks traveling on area roadways, would not result in an incremental increase in cancer risk greater than 10 in one million or a hazard index of 1.0 or greater at any offsite sensitive receptors. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.2-4: Exposure of Sensitive Receptors to Odors

The increase in municipal solid waste processed and landfilled at the project site as expansion occurs is not expected to result in additional sources or objectionable odors nor increased intensity of odors. Additionally, the area of landfill expansion is further away from the nearest offsite sensitive receptors than the portions of the landfill that are the currently being filled. Any odors associated with proposed storage of baled recyclables would be addressed with implementation of the nuisance and odor control measures described in the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018. Therefore, it is not anticipated that the project would result in odors adversely affecting a substantial number of people. This impact would be **less than significant**.

The occurrence and severity of odor impacts depend on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose a substantial number of people to objectionable odors would be deemed to have a significant impact.

Odor complaints associated with the existing RHR Landfill are infrequent and often unverified. As explained in Section 4.2.2, "Environmental Setting," the only verified complaints since 2015 have been attributed to operations at the JPO composting operation (Jepson Prairie Organics 2016).

As demonstrated by the project components listed in Chapter 3, "Project Description," the project would not affect operations at the JPO composting operation. Odors related to proposed baled recyclable storage at the site would be mitigated through the nuisance and odor control measures incorporated into the project (see Section 3.7.4 in Chapter 3, Project Description, of this SEIR) and described in the RHR Recyclable Material Bale Management Operations Plan (Appendix B of this SEIR). The project would include expansion of the existing landfill and allow for an increase in the rate at which the landfill receives municipal solid waste. Additionally, the area of landfill expansion, the Triangle, is further away from the nearest offsite sensitive receptors than the portions of the landfill that are currently being filled. Therefore, the project would not result in odors adversely affecting a substantial number of people. For these reasons, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.
4.3 ARCHAEOLOGICAL, HISTORICAL, AND TRIBAL CULTURAL RESOURCES

This section analyzes and evaluates the potential impacts associated with implementation of the proposed amendments (project) to the Land Use Permit (LUP) for the Recology Hay Road (RHR) Landfill on known and unknown cultural resources. Cultural resources include districts, sites, buildings, structures, or objects generally older than 50 years and considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. They include pre-historic resources, historic-era resources, and "tribal cultural resources" (the latter as defined by Assembly Bill (AB) 52, Statutes of 2014, in Public Resources Code [PRC] Section 21074).

Archaeological resources are locations where human activity has measurably altered the earth or left deposits of prehistoric or historic-era physical remains (e.g., stone tools, bottles, former roads, house foundations). Historical (or architectural) resources include standing buildings (e.g., houses, barns, outbuildings, cabins) and intact structures (e.g., dams, bridges, roads, districts), or landscapes. A cultural landscape is defined as a geographic area (including both cultural and natural resources and the wildlife therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values. Tribal cultural resources (TCRs) includes site features, places, cultural landscapes, sacred places or objects, which are of cultural value to a tribe.

One comment letter regarding cultural resources was received in response to the Notice of Preparation. The Native American Heritage Commission requested AB 52 and Senate Bill (SB) 18 compliance information. However, SB 18 does not apply to the project because there is not a General Plan amendment associated with the project (which is the trigger for SB 18 compliance). Further, SB 18 is not a CEQA requirement and, as a result, is not discussed in this section. AB 52 compliance is described below.

4.3.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

National Park Service

Federal protection of cultural resources is legislated by (a) the National Historic Preservation Act (NHPA) of 1966 as amended by 16 U.S. Code 470, (b) the Archaeological Resource Protection Act of 1979, and (c) the Advisory Council on Historical Preservation. These laws and organizations maintain processes for determination of the effects on historical properties eligible for listing in the National Register of Historic Places (NRHP).

Section 106 of the NHPA and accompanying regulations (36 Code of Federal Regulations [CFR] Part 800) constitute the main federal regulatory framework guiding cultural resources investigations and requires consideration of effects on properties that are listed in, or may be eligible for listing in the NRHP. The NRHP is the nation's master inventory of known historic resources. It is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, and cultural districts that are considered significant at the national, state, or local level.

The formal criteria (36 CFR 60.4) for determining NRHP eligibility are as follows:

- The property is at least 50 years old (however, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);
- > It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and
- ► It possesses at least one of the following characteristics:
 - Association with events that have made a significant contribution to the broad patterns of history (events).
 - Association with the lives of persons significant in the past (persons).

- Distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).
- Has yielded, or may be likely to yield, information important to prehistory or history (information potential).

Listing in the NRHP does not entail specific protection or assistance for a property but it does guarantee recognition in planning for federal or federally-assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in the NRHP must be evaluated under CEQA.

The National Register Bulletin also provides guidance in the evaluation of archaeological site significance. If a heritage property cannot be placed within a particular theme or time period, and thereby lacks "focus," it is considered not eligible for the NRHP. In further expanding upon the generalized National Register criteria, evaluation standards for linear features (such as roads, trails, fence lines, railroads, ditches, flumes, etc.) are considered in terms of four related criteria that account for specific elements that define engineering and construction methods of linear features: (1) size and length; (2) presence of distinctive engineering features and associated properties; (3) structural integrity; and (4) setting. The highest probability for NRHP eligibility exists within the intact, longer segments, where multiple criteria coincide.

STATE PLANS, POLICIES, AND REGULATIONS

California Register of Historical Resources

The California Register of Historical Resources established a list of those properties which are to be protected from substantial adverse change (Public Resource Code [PRC] Section 5024.1). A historical resource may be listed in the California Register if it meets any of the following criteria:

- It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
- ► It is associated with the lives of persons important in California's past.
- It embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual, or possesses high artistic value.
- ► It has yielded or is likely to yield information important in prehistory or history.

The Register includes properties that are listed or have been formally determined to be eligible for listing in the NRHP, State Historical Landmarks, and eligible Points of Historical Interest. Other resources require nomination for inclusion in the Register. These may include resources contributing to the significance of a local historic district, individual historical resources, historical resources identified in historic resource surveys conducted in accordance with State Historic Preservation Office (SHPO) procedures, historic resources or districts designated under a local ordinance consistent with Commission procedures, and local landmarks or historic properties designated under local ordinance.

California Environmental Quality Act

CEQA requires public agencies to consider the effects of their actions on both "historical resources," "unique archaeological resources," and "tribal cultural resources." Pursuant to PRC Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" and PRC Section 21084.2, a "project with an effect that may cause a substantial adverse change in the significance is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether projects would have effects on unique archaeological resources.

Historical Resources

"Historical resource" is a term with a defined statutory meaning (PRC, Section 21084.1; determining significant impacts to historical and archaeological resources is described in the State CEQA Guidelines, Sections 15064.5[a] and [b]). Under State CEQA Guidelines Section 15064.5(a), historical resources include the following:

- ► A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (PRC, Section 5024.1).
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
- ► Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the California Register of Historical Resources (PRC, Section 5024.1), including the following:
 - Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
 - Is associated with the lives of persons important in our past;
 - Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
 - Has yielded, or may be likely to yield, information important in prehistory or history.
- ► The fact that a resource is not listed in or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the PRC), or identified in a historical resources survey (meeting the criteria in Section 5024.1(g) of the PRC) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Section 5020.1(j) or 5024.1.

Unique Archaeological Resources

CEQA also requires lead agencies to consider whether projects will affect unique archaeological resources. PRC, Section 21083.2, subdivision (g), states that unique archaeological resource means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- ► Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- ► Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Tribal Cultural Resources

CEQA also requires lead agencies to consider whether projects will affect tribal cultural resources. PRC, Section 21074 states the following:

- ► Tribal cultural resources" are either of the following:
 - Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
 - Included or determined to be eligible for inclusion in the California Register of Historical Resources.

- Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.
- A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.
- ► A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Health and Safety Code, Section 7052 and 7050.5

Section 7052 of the Health and Safety Code states that the disturbance of Native American cemeteries is a felony. Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If determined to be Native American, the coroner must contact the California Native American Heritage Commission (NAHC).

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural and Sacred Sites Act applies to both State and private lands. The Act requires that upon discovery of human remains, that construction or excavation activity cease and that the county coroner be notified. If the remains are of a Native American, the coroner must notify the NAHC. The NAHC then notifies those persons most likely to be descended from the Native American's remains. The Act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

Public Resource Code, Section 5097

PRC, Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the NAHC. Section 5097.5 of the Code states the following:

No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate pale ontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Assembly Bill 52

Assembly Bill (AB) 52, signed by Governor Edmund G. Brown, Jr., in September of 2014, establishes a new class of resources under CEQA: "tribal cultural resources" (TCRs). AB 52, as codified in PRC Sections 21080.3.1, 21080.3.2, and 21082.3, requires that lead agencies undertaking CEQA review must, upon written request of a California Native American Tribe, begin consultation once the lead agency determines that the application for the project is complete, prior to the issuance of an NOP of an EIR or notice of intent to adopt a negative declaration or mitigated negative declaration. AB 52 also requires revision to CEQA Appendix G, the environmental checklist. This revision would create a new category for TCRs. As defined in PRC Section 21074, to be considered a TCR, a resource must be either:

- ► listed or determined to be eligible for listing, on the national, state, or local register of historic resources; or
- ► a resource that the lead agency determines, in its discretion and supported by substantial evidence, to treat as a tribal cultural resource pursuant to the criteria in PRC Section 50241(c). PRC Section 5024.1(c) provides that a resource meets criteria for listing as an historic resource in the California Register if any of the following apply:
 - It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

- It is associated with the lives of persons important in our past.
- It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
- It has yielded, or may be likely to yield, information important in prehistory or history.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County General Plan

The Solano County General Plan contains the following policies that are relevant to cultural, tribal, and archaeological resources:

- ► Policy RS.P-24: Protect the unique character and qualities of the Primary Zone by preserving the cultural heritage and the strong agricultural base.
- ▶ Policy RS.P-38: Identify and preserve important prehistoric and historic structures, features, and communities.
- Policy RS.P-40: Consult with Native American governments to identify and consider Native American placed in land use planning.

4.3.2 Environmental Setting

Information related to the environmental setting within the project area is based on the Recology Hay Road Project Cultural Resources Study, prepared in 2018 (ESA 2018).

REGIONAL PREHISTORY

Categorizing the prehistoric period into cultural stages allows researchers to describe a broad range of archaeological resources with similar cultural patterns and components during a given timeframe, thereby creating a regional chronology. Framework has been provided for the interpretation of the southern Sacramento Valley/ San Francisco Bay Area, dividing human history in the region into four periods: the Paleoindian Period (11,500 to 8000 B.C.E [Before Common Era]), the Early Period (8000 to 500 B.C.E), the Middle Period (500 B.C.E to A.D. [anno Domini] 1050), and the Late Period (A.D. 1050 to 1550). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

The Paleoindian Period was characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during Paleoindian Period has not yet been discovered in the lower Sacramento Valley. During the Early Period (Lower Archaic; 8000 to 3500 B.C.E), geographic mobility continued from the Paleoindian Period and is characterized by the millingslab and handstone as well as large wide-stemmed and leaf-shaped projectile points. The first cut shell beads and the mortar and pestle are documented in burials during the Early Period (Middle Archaic; 3500 to 500 B.C.E), indicating the beginning of a shift to sedentism. During the Middle Period, which includes the Lower Middle Period (Initial Upper Archaic; 500 B.C.E to A.D. 430), and Upper Middle Period (Late Upper Archaic; A.D. 430 to 1050), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The first rich black middens are recorded from this period. The addition of milling tools, obsidian and chert concave-base projectile points, and the occurrence of sites in a wider range of environments suggest that the economic base was more diverse. By the Upper Middle Period, mobility was being replaced by the development of numerous small villages. Around A.D. 430 a "dramatic cultural disruption" occurred evidenced by the sudden collapse of the Olivella saucer bead trade network. During the Initial Late Period (Lower Emergent; A.D. 1050 to 1550), social complexity developed toward lifeways of large, central villages with resident political leaders and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched projectile points, and a diversity of beads and ornaments (Golder Associates 2018:15).

ETHNOGRAPHY

Based on a compilation of ethnographic, historic, and archaeological data, there was a group known as the Patwin, who once occupied the general vicinity of the project area. "Patwin" refers to speakers of one of three languages in the Wintuan family, which also includes Wintu and Nomlaki languages. While traditional anthropological literature portrayed the Patwin peoples as having a static culture, today it is better understood that many variations of culture and ideology existed within and between villages. While these "static" descriptions of separations between native cultures of California make it an easier task for ethnographers to describe past behaviors, this masks Native adaptability and self-identity. California's Native Americans never saw themselves as members of larger "cultural groups," as described by anthropologists. Instead, they saw themselves as members of specific villages, perhaps related to others by marriage or kinship ties, but viewing the village as the primary identifier of their origins.

As with most of the hunting-gathering groups of California, the Patwin "tribelet" represented the basic social and political unit. Typically, a tribelet chief would reside in a major village where ceremonial events were also typically held. The status of such individuals was patrilineally inherited among the Patwin, although village elders had considerable power in determining who actually succeeded to particular positions. The chief's main responsibilities involved administration of ceremonial and economic activities. Such individuals decided when and where various fishing, hunting or gathering expeditions would occur, and similarly made critical decisions concerning the more elaborate ceremonial activities. The chief also played a central role in resolving conflicts within the community or during wars which occasionally broke out with neighboring groups. Allegedly, Patwin chiefs had more authority than his counterparts among many of the other central California groups.

Economically, the Patwin engaged in hunting and gathering in a territory that encompassed riverine corridors, open valley environments, and delta wetlands. These diverse environments contained a wide variety of resources available for exploitation, including grass seeds, acorns, bulbs and tubers, bear, deer, elk, antelope, a variety of bird species, and rabbit and other small mammals.

After European contact, Patwin society was severely disrupted by missionization, disease, and displacement. European American influences within Patwin territory increased dramatically as ranching and farming became popular in the area. European American settlers, especially within the Sacramento Valley, quickly made inroads into lands occupied by Native Americans. Conflicts grew in number, and Patwin populations continued to decline from military skirmishes, vigilante raids, and other causes. In 1972, the Bureau of Indian Affairs listed only 11 remaining Patwin descendants. Despite the massive decline in population, the Patwin still reside in Solano County and many intermarried with the Wintu (ESA 2018:15-16).

HISTORIC SETTING

In 1772, Pedro Fages became the first European to lead an expedition to the general area of what is today known as Carquinez Strait. Gabriel Moraga crossed the Strait in 1810 during a raid against the Suisun tribe. In 1823, Mission San Francisco Solano was established, and baptized 67 local Patwins over the next ten years.

Following the end of Spanish rule in California around 1832, the Mexican government began dividing formally Spanish held land into large tracts of land called "ranchos." In 1835, the Mexican government ordered General Mariano Guadalupe Vallejo to colonize the area around today's Fairfield/Suisun City to prevent the Russians from Fort Ross moving into the interior. The land grants from the Mexican government allowed the rapid settling of the ranchos within lower Sacramento Valley and Delta. These ranchos were used primarily for cattle grazing as well as farming of vineyards, fruits, and vegetables.

After an epoch of exploration and colonization by the Spanish, Russians, and, later, Mexicans, the missionization of the indigenous population and the development of presidios and civilian ranchos and pueblos throughout California created unprecedented landscape and social change. Later more secular influence on the political affairs of California in the nineteenth century led to the sale of lands to non-Hispanics by the early 1830s. Among these early settlers were Pena and Manuel Cabeza Vaca. In 1843, they acquired a grant of 44,380 acres from the Mexican government.

Known as Rancho Los Putos, it was on the west side of the Sacramento Valley in what is now part of Solano and Yuba Counties. Like their compatriots, they erected adobe ranchos on their land and ran huge herds of cattle and sheep.

Following the Treaty of Guadalupe Hidalgo in 1848, Mexico ceded California to the United States. John Marshall found gold days before the treaty signing, and while it was not the first gold discovery in California, it had the greatest effect. The allure of gold caused a massive influx of settlers from the rest of the country and around the world. This demographic change had a detrimental effect on aboriginal populations, including the groups in the Central Valley.

State legislature established Solano County as one of the original counties when California entered the United States in 1850. During the Gold Rush, the migration influx did not enter Yolo County, as the Sacramento River was a difficult barrier to cross and there was little reason to cross the river. When Solano County was formed, General Mariano Vallejo suggested the County be named after both the missionary Francis Solano of Peru and Chief Sem Yeto (baptized Francis Solano) of the Suisun Patwin Indians. During the early 1850s, both Vallejo and Benicia acted as the state capitol before the capitol's permanent move to Sacramento in 1854.

During the Gold Rush, Solano County ranchers and farmers quickly realized they could make a profit selling crops and livestock to miners. The largest towns were close to the San Pablo and Suisun bays, and convenient for shipping out goods. Similarly, the Sacramento Valley remained relatively isolated and sparsely populated until the advent of the Gold Rush period. Sacramento's proximity to mining areas, and its accessibility, quickly made the area a trading and economic center. As a result, Solano County became a major thoroughfare for would be miners heading from San Francisco to Sacramento and the mines further east.

The first few decades of ranching in American California was an open range affair, with ranchers taking advantage of the dense growth of naturally occurring grasses that covered the valley and foothill areas. As more and more people sought to till the soil the open range situation became increasingly problematic. This culminated in the Trespass Law of 1870, which essentially mandated that ranchers were required to keep their cattle off of land they did not own. It did not sound a death knell for the cattle industry, but forced some major changes. Ranchers began running more cattle on less land, requiring irrigation, and the raising of more feed. This dovetailed well with the pursuit of the farmers who were now producing more and more grain.

Historically, the vicinity of the Project area has been used for grazing and agriculture. During the Spanish and Mexican periods, the lands were likely used for cattle grazing, as part of the Rancho Los Putos. The land remained in use as such until 1960s, when the RHR landfill began operations (ESA 2018:16-18).

RECORDS SEARCH, SURVEYS, AND CONSULTATION

Records Search and Survey

As described in the 2018 Cultural Resources Report prepared for Recology (ESA 2018), a records search was conducted at the Northwest Information Center (NWIC) of California Historical Resources Information System at Sonoma State University on May 16, 2017. Archival research included a review of cultural resources and investigations within 0.5 miles of the project site. In addition to NWIC base maps and site record forms, other sources that were reviewed included historic maps, the Directory of Properties in the Historic Property Data File for Solano County, the National Register of Historic Places, the California Register of Historical Resources, the *California Inventory of Historic Resources* (1976), the *California Historical Landmarks* (1996), and the *California Points of Historical Interest* (1992).

Results of the records search revealed that the project site has been previously surveyed in part or in its entirety as part of two cultural resources studies, and that an additional cultural resource study has been conducted within 0.5 miles of the project site. The review of information revealed that no previously recorded cultural resources have been identified within 0.5 miles of the project site.

An intensive pedestrian survey of the 16-acre lateral landfill expansion area was conducted on June 1, 2017 and an additional survey of the borrow pit expansion area was conducted on July 17, 2017. The surveys were conducted using 20-meter-wide and 10-meter-wide parallel transects, respectively. Results of the two cultural resources surveys did not identify any archaeological or architectural resources greater than 45 years of age within the project site (ESA 2018:22).

Tribal Cultural Resources

On February 28, 2018, Solano County mailed letters inviting local Native American tribes who had previously requested notification regarding projects within the County's jurisdiction to consult on the project pursuant to AB 52. Letters were sent to the following tribes and included the location of the project, background information about the project, and project objectives:

- ► Yocha Dehe Wintun Nation, Marilyn Delgado, Director of Cultural Resources;
- ► Cortina Band of Indians, Charlie Wright, Chairperson

No response was received on behalf of the Cortina Band of Indians. Yocha Dehe Wintun Nations responded to the consultation letter on April 5, 2018, indicating no known cultural resources near the RHR Landfill. However, Yocha Dehe requested consultation should project implementation result in the finding of any cultural resources.

In addition, the Native American Heritage Commission (NAHC) on May 1, 2017 to request a database search for sacred lands or other cultural properties of significance within or adjacent to the project site. ESA received a response on May 5, 2017. The sacred lands survey did not identify the presence of cultural resources within or adjacent to the project site.

4.3.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

The impact analysis for archaeological and historical resources is based on the findings and recommendations of the 2018 Cultural Resources Study. Additionally, information related to TCRs is based on findings reported in the NAHC database search as well as Native American consultation under AB 52. The analysis is also informed by the provisions and requirements of federal, state, and local laws and regulations that apply to cultural resources.

SIGNIFICANCE CRITERIA

Based on Appendix G of the State CEQA Guidelines, the project would result in a potentially new significant impact, or substantial increase in a previously identified significant impact, on cultural resources if it would:

- cause a substantial adverse change in the significance of a historical resource pursuant to 15064.5;
- cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5; or
- disturb any human remains, including those interred outside of dedicated cemeteries.

ISSUES NOT DISCUSSED FURTHER

Historical Resources

As described above, no potential or designated historical resources/sites were identified at the project site, either during the records search or during the pedestrian survey. Therefore, project construction and operation would have no impact on historical resources. This issue is not analyzed further.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.3-1: Potential Impacts to Unique Archaeological Resources

Results of the records search and pedestrian survey did not indicate any known archaeological sites within the project site. However, project-related ground-disturbing activities could result in discovery or damage of yet undiscovered subsurface unique archaeological resources. This would be a **potentially significant** impact.

As indicated through the records search and pedestrian surveys, no known prehistoric or historic-period archaeological sites are present within the project site. Because cultural resources surveys and archival review did not result in the identification of any potentially significant prehistoric or historic-period archaeological resources within the project site or a half-mile radius, the archaeological sensitivity of the project site is considered low. No archaeological monitoring or research is recommended before project implementation.

Implementation of the project would involve expansion of the existing landfill, which would include preconstruction or construction-related ground disturbing activities and could result in encountering previously undiscovered or unrecorded archaeological sites and materials. These activities could damage or destroy previously undiscovered unique archaeological resources. This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.3-1: Halt Ground-Disturbing Activity Upon Discovery of Subsurface Archaeological Features

In the event that any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits, are discovered during construction, all ground-disturbing activity within 100 feet of the resources shall be halted and a professional archaeologist, qualified under the Secretary of the Interior's Professional Qualification Standards, shall be retained to assess the significance of the find. Specifically, the archaeologist shall determine whether the find qualifies as an historical resource, a unique archaeological resource, or a tribal cultural resource. If the find does fall within one of these three categories, the qualified archaeologist shall then make recommendations to Solano County regarding appropriate procedures that could be used to protect the integrity of the resource and to ensure that no additional resources are affected. Procedures could include but would not necessarily be limited to, preservation in place, archival research, subsurface testing, or contiguous block unit excavation and data recovery, with preservation in place being the preferred option if feasible. If the find is a tribal cultural resource, Solano County shall provide a reasonable opportunity for input from representatives of any tribe or tribes the professional archaeologist believes may be associated with the resource. Solano County shall implement such recommended measures if it determines that they are feasible in light of project design, logistics, and cost considerations.

Significance after Mitigation

The certified 1993 EIR for the landfill included similar mitigation (Recommendation 11.a.) to halt construction activities in the event of discover. Mitigation Measure 4.3-1 would replace the previously adopted mitigation measure. Implementation of Mitigation Measure 4.3-1 would reduce impacts associated with archaeological resources to a **less-than-significant** level because it would require the performance of feasible, professionally accepted, and legally compliant procedures for the discovery of any previously undocumented archaeological resources.

Impact 4.3-2: Impacts to Unknown Tribal Cultural Resources

Consultation with the Yocha Dehe Wintun Nation has resulted in no resources identified within the project boundaries as tribal cultural resources per AB 52. However, it is possible that tribal cultural resources could be encountered during construction within the Triangle. Due to the potential for unknown resources within the Triangle that may be discovered through project construction activities, potential impacts to tribal cultural resources could be **potentially significant**.

As part of the 2013/2014 legislative session, AB 52 established a new class of resources under CEQA, TCRs, and requires that lead agencies undertaking CEQA review must, upon written request of a California Native American Tribe, begin consultation once the lead agency determines that the application for the project is complete. As detailed above, the County sent letters to tribal representatives at Yocha Dehe Wintun Nation and Cortina Band of Indians.

A response was received on April 5, 2018 from Yoche Dehe Wintun Nation acknowledging that no known cultural resources are present near the Hay Road project site and that a cultural monitor would not be necessary as part of project construction activities. However, the correspondence included a recommendation for cultural sensitivity training before project initiation. Although the NAHC Sacred Lands database search was negative and the project site was determined to have a low sensitivity for cultural materials, in the event that tribal cultural resources are encountered during construction activity, this could result in a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.3-2: Pre-Construction Cultural Sensitivity Training

Prior to ground disturbance activities for the borrow pit and lateral expansion (Triangle), the project applicant shall provide evidence to Solano County to demonstrate compliance with Mitigation Measure 4.3-2. The project applicant shall arrange for a qualified archaeologist to conduct a cultural resources sensitivity training for all construction personnel who will be active on the project site during project-related construction activities. The training will be provided before the initiation of construction activities and will be developed and conducted in coordination with a representative from Yocha Dehe Wintun Nation. The training will include relevant information regarding sensitive cultural resources, including applicable regulations, protocols for avoidance, and consequences of violating State laws and regulations. The cultural sensitivity training will also describe appropriate avoidance and minimization measures for resources that have the potential to be located on the project site and will outline what to do and whom to contact if any potential tribal cultural resources are discovered.

Significance after Mitigation

Implementation of Mitigation Measure 4.3-2 would reduce impacts to a **less-than-significant** level by requiring preconstruction training for construction personnel and ensuring that proper care and protocol of potentially undiscovered tribal cultural resources be taken.

Impact 4.3-3: Discovery of Human Remains

Based on documentary research, no evidence suggests that any prehistoric or historic-era marked or un-marked human interments are present within or in the immediate vicinity of the project site. However, ground-disturbing construction activities could uncover previously unknown human remains. Compliance with California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code Section 5097 would make this impact **less than significant**.

Based on documentary research, no evidence suggests that any prehistoric or historic-era marked or un-marked human interments are present within or in the immediate vicinity of the project site. However, the location of grave sites and Native American remains can occur outside of identified cemeteries or burial sites. Therefore, there is a possibility that unmarked, previously unknown Native American or other graves could be present within the project site and could be uncovered by project-related construction activities.

California law recognizes the need to protect Native American human burials, skeletal remains, and items associated with Native American burials from vandalism and inadvertent destruction. The procedures for the treatment of Native American human remains are contained in California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097.

These statutes require that, if human remains are discovered during any construction activities, potentially damaging ground-disturbing activities in the area of the remains shall be halted immediately, and the Solano County coroner and NAHC shall be notified immediately, in accordance with to PRC Section 5097.98 and Section 7050.5 of

California's Health and Safety Code. If the remains are determined by NAHC to be Native American, the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. Following the coroner's findings, the archaeologist, the NAHC-designated Most Likely Descendant, and the landowner shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities for acting upon notification of a discovery of Native American human remains are identified in PRC Section 5097.94.

Compliance with California Health and Safety Code Sections 7050.5 and 7052 and PRC Section 5097 would provide an opportunity to avoid or minimize the disturbance of human remains, and to appropriately treat any remains that are discovered. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

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4.4 BIOLOGICAL RESOURCES

This section describes the potential effects of the project on biological resources. This section also addresses biological resources known or with potential to occur in the project vicinity, including common vegetation and habitat types, sensitive plant communities, and special-status plant and animal species. The analysis includes a description of the existing environmental conditions, the methods used for assessment, the potential direct and indirect impacts of project implementation not included in the 2005 Subsequent Environmental Impact Report (SEIR) for the Hay Road Landfill Project (Solano County 2005), and mitigation measures recommended to address impacts determined to be significant or potentially significant. The data and documents reviewed in preparation of this analysis included:

- ▶ 2005 SEIR for the Hay Road Landfill Project (Solano County 2005);
- Burrowing Owl Habitat Assessment (ESA 2016a);
- California Tiger Salamander Habitat Assessment (ESA 2016b);
- ▶ Branchiopod Survey Report (ESA 2016c);
- ► Special-status Plant Survey Report (ESA 2016d);
- Organics Transload Facility Habitat Assessment (ESA 2017a);
- ► Hydro Flow Analysis (ESA 2017b);
- Contra Costa Goldfields Survey Report (ESA 2017c);
- Delta Green Ground Beetle Survey Report and Supplemental Habitat Assessment Report (Entomological Consulting Services, Ltd. 2016, 2018);
- ▶ reconnaissance-level survey of the project site conducted on August 7, 2017;
- records search and GIS query of the California Natural Diversity Database (CNDDB) within 5 miles of the project site (2018);
- California Native Plant Society (CNPS), Rare Plant Program database search of the Allendale, Dixon, Saxon, Elmira, Dozier, Liberty Island, Denverton, Birds Landing, and Rio Vista U.S. Geological Service 7.5-minute quadrangles (CNPS 2018);
- eBird online database of bird observations (eBird 2017); and
- aerial photographs of the project site and surrounding area.

Comments received on the NOP regarding biological resources that could be adversely affected by the project included comments from California Department of Fish & Wildlife (CDFW). Comments from CDFW generally pertain to regulatory requirements under their jurisdiction (i.e., California Endangered Species Act and Lake and Streambed Alteration Agreements) and a request that the SEIR include measures to ensure complete take avoidance of California tiger salamander, Swainson's hawk, burrowing owl, and tricolored blackbird. The NOP and written comments received regarding the NOP are included in Appendix A of this Draft SEIR.

4.4.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

Federal Endangered Species Act

Section 9 of the federal Endangered Species Act (ESA) prohibits "take" of federally listed threatened and endangered species. The ESA defines "take" as any action that would harass, harm, pursue, hunt, shoot, wound, kill, injure, trap, capture, or collect any listed species. "Harm" includes significant habitat modification that could result in injury or

death to a species. Federal projects, federally funded projects, or projects requiring a federal permit must comply with the ESA through consultation with USFWS or the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-Fisheries), or both. If a proposed non-federal project may result in take of a listed species, and there is no nexus with any federal agency (e.g., no federal funding or other authority), an Incidental Take Permit under Section 10(a)(1)(B) of the ESA is required; a Habitat Conservation Plan (HCP) must accompany the permit application.

Clean Water Act Section 404

Areas meeting the regulatory definition of *waters of the United States* are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE). These waters may include all waters "used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (e.g., intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, and natural ponds), all impoundments of waters otherwise defined as waters of the United States, tributaries of waters otherwise defined as waters of the United States, tributaries of waters otherwise defined as waters of the United States, the territorial seas, and wetlands adjacent to waters of the United States" (33 Code of Federal Regulations [CFR], Part 328, Section 328.3). The USACE, under provisions of Section 404 of the Clean Water Act (1972) (CWA) and Section 10 of the Rivers and Harbors Act (1899), has jurisdiction over waters of the United States. Waters thus regulated are termed "jurisdictional waters." Impacts to jurisdictional waters, including wetlands (a special category of water of the United States), require a permit from the USACE and typically require mitigation. Impacts to wetlands often require compensation in-kind to ensure no net loss of extent and function of wetlands.

Bald Eagle and Golden Eagle Protection Act

The Bald Eagle and Golden Eagle Protection Act prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. Under the Act, it is a violation to "...take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time or in any manner, any bald eagle commonly known as the American eagle, or golden eagle, alive or dead, or any part, nest, or egg, thereof..." *Take* is defined to include pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, and disturb.

STATE PLANS, POLICIES, AND REGULATIONS

California Endangered Species Act

Section 2080 of the California Endangered Species Act (CESA) prohibits "take" of state-listed threatened and endangered species. The CESA defines take as any action or attempt to hunt, pursue, catch, capture, or kill any listed species. If a proposed project may result in "take" of a listed species, a permit pursuant to Section 2080 of CESA is required from the California Department of Fish and Wildlife (CDFW). Take of state-listed species is authorized through Section 2081 through a permit process. Take can also be authorized through Section 2835 with an approved Natural Community Conservation Plan.

Porter-Cologne Water Quality Control Act

Areas meeting the regulatory definition of *waters of the state* are subject to the jurisdiction of the California Regional Water Quality Control Board (RWQCB). *Waters of the state* means any surface water or groundwater, including saline waters, within the boundaries of the state (California Water Code, Chapter 2, 13050(e)). Any person discharging waste, or proposing to discharge waste, within any region that could affect the quality of the waters of the state, other than into a community sewer system, must file a report of waste discharge with the appropriate regional board (California Water Code, Article 4, 13260(a)(1)).

California Fully Protected Species

In the 1960s, before CESA was enacted, the California Legislature identified species for specific protection under the California Fish and Game Code. These *fully protected* species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research, and relocation of the bird species for the protection of livestock. Fully protected species are described in Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code.

These protections state that "...no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected [bird], [mammal], [reptile or amphibian], or [fish]."

California Fish and Game Code Section 1602

Activities that result in the diversion or obstruction of the natural flow of a stream, substantially change its bed, channel or bank, or utilize any materials (including vegetation) from the streambed, require that the project applicant enter into a Streambed Alteration Agreement with CDFW pursuant to Section 1602 of the California Fish and Game Code. The definition of streams includes "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams, and watercourses with subsurface flows." Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife.

California Fish and Game Code Section 3503, Bird Nests and Birds of Prey

Bird nests are protected in California under Section 3503 of the California Fish and Game Code. Section 3503 states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Disturbance during the breeding season can result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by CDFW. CDFW may issue permits authorizing take.

Section 3503.5 of the Code specifies that it "is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano Multispecies Habitat Conservation Plan

The Solano Multispecies Habitat Conservation Plan (MSHCP) has not yet been adopted. A final draft EIR was released in October 2012. The purpose of the Solano HCP is to: promote the conservation of biological diversity and the preservation of endangered species and their habitats consistent with the recognition of private property rights; provide for a healthy economic environment for the citizens, agriculture, and industries; and allow for the ongoing maintenance and operation of public and private facilities in Solano County. The plan provides coverage for 36 plant and animal species. The MSHCP includes three covered activity zones:

- > Zone 1: Urban Zone (cities of Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, and Vallejo),
- Zone 2: Solano County Water Agency and Irrigation and Reclamation District Zones (land within boundaries of various local water and irrigation districts), and
- Zone 3: Remainder of the County.

The project site is within Zone 3 of the Solano MSHCP plan area. However, Solano County is not a participant in the MSHCP. The project site contains several proposed designated conservation areas, including for burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), California tiger salamander (*Ambystoma californiense*), grasslands and vernal pools. Covered activities described in the Solano MSCHP include: proposed development projects; construction of new public facilities; operation and maintenance of public facilities; work associated with Solano Irrigation District service area inclusions, expansions, and annexations; habitat management, enhancement, restoration, and construction work; monitoring, scientific data collection, and related activities in designated reserves, mitigation sites/banks, and open space lands; and relocation of covered species.

Solano County General Plan

Chapter 4, Resources, of the Solano County General Plan (Solano County 2008) contains the following biologicalresource-related goals and policies that are relevant to the proposed project:

GOAL RS.G-1: Manage and preserve the diverse land, water, and air resources of the county for the use and enrichment of the lives of present and future generations.

GOAL RS.G-2: Ensure continued presence and viability of the county's various natural resources.

GOAL RS.G-3: Repair environmental degradation that has occurred, and seek an optimum balance between the economic and social benefits of the county's natural resources.

GOAL RS.G-4: Preserve, conserve, and enhance valuable open space lands that provide wildlife habitat; conserve natural and visual resources; convey cultural identity; and improve public safety.

- Policy RS.P-1: Protect and enhance the county's natural habitats and diverse plant and animal communities, particularly occurrences of special-status species, wetlands, sensitive natural communities, and habitat connections.
- ► Policy RS.P-2: Manage the habitat found in natural areas and ensure its ecological health and ability to sustain diverse flora and fauna.
- Policy RS.P-3: Focus conservation and protection efforts on high-priority habitat areas depicted in Figure RS-1 (Priority Habitat Areas identified in Chapter 4 of the County General Plan.
- Policy RS.P-5: Protect and enhance wildlife movement corridors to ensure the health and long-term survival of local animal and plant populations. Preserve contiguous habitat areas to increase habitat value and to lower land management costs.

The Solano County Resource conservation overlay is depicted in Chapter 4, 'Resources', Figure RS-1 and RS-2, of the Solano County General Plan (2008) and includes the following resources:

- California red-legged frog critical habitat and core recovery areas
- ► Callippe butterfly priority conservation areas
- Giant garter snake priority conservation areas
- Priority habitat corridors
- Vernal pool conservation areas
- ► Suisun Marsh Protection Plan primary management zone

4.4.2 Environmental Setting

REGIONAL SETTING

The Recology Hay Road (RHR) Landfill is located west of SR 113 and south of Hay Road in unincorporated Solano County. The project site is approximately 12 to 20 feet in elevation and contains mostly disturbed/ruderal and developed land (approximately 389.5 acres), including the landfill, several buildings, roads, and parking areas (Table 4.4-1, Figure 4.4-1). Landfill expansion would occur within the approximately 24-acre Triangle within the eastern portion of the project site. An 18-acre Bird Sanctuary Pond is located adjacent to the Triangle, the Western Mitigation Area is located on the western edge of the project site, and the Eastern Mitigation Area is located south of the Triangle (Figure 4.4-1).



Figure 4.4-1 Land Cover

VEGETATION AND WILDLIFE

Grassland

The project site contains approximately 155 acres of grassland habitat within the Triangle and the Western and Eastern Mitigation Areas (Table 4.4-1, Figure 4.4-1). The grassland habitat contains many species of annual grasses and forbs, and bromes (*Bromus hordeaceaus*, *B. diandrus*), Italian rye grass (*Festuca perennis*), and bur clover (*Medicago polymorpha*) are dominant (ESA 2016d).

Wetlands and Vernal Pools

The project site contains approximately 75 acres of northern claypan vernal pool/vernal swale habitat within the Triangle and Eastern Mitigation Area, and 26 acres of open water habitat within the Bird Sanctuary and within a pond near the existing soil borrow pit (Table 4.4-1, Figure 4.4-1, ICF 2017). The project site includes a large playa pool that extends north to south and the northern portion of this playa pool is within the Triangle. An approximately 1-mile drainage ditch runs along the northeast corner of the project site (Table 4.4-1, Figure 4.4-1). Vernal pool-associated species are present within the project site, including alkali heath (*Frankenia salina*), Fremont's goldfields (*Lasthenia fremontii*), salt grass (*Distichlis spicata*), California eryngo (*Eryngium aristulatum*), butter 'n' eggs (*Triphysaria eriantha* ssp. *eriantha*), hogwallow starfish (*Hesperevax caulescens*), and stalked popcorn flower (*Plagiobothrys stipitatus*; ESA 2016d).

Trees

Trees are present within the northwest corner of the project site and along the southern border of the Eastern Mitigation Area; mostly non-native eucalyptus. During the 2017 reconnaissance-level survey, a large nest was observed within one of the large eucalyptus trees and owl pellets were observed beneath the nest. No trees within the project site are planned for removal.

Habitat Type	Size (acres)
Developed	49.3
Disturbed/Ruderal	340.2
Grassland	153.9
Drainage Ditch	3.1
Vegetated Ditch	0.8
Detention Basin	0.04
Open Water	25.8
Vernal Pool	72.5
Vernal Pool Swale	2.3

Table 4.4-1 Habitat Types within the Project Site

Source: Data compiled by Ascent Environmental in 2017 and 2018

SPECIAL-STATUS SPECIES

Special-status species are plants and animals that are legally protected under the California Endangered Species Act (CESA; Fish and Game Code, Section 2050 et seq.), the federal Endangered Species Act (ESA), or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. For this SEIR, special-status species are defined as:

- species listed or proposed for listing as threatened or endangered under the ESA (50 Code Fed. Regs., Section 17.12) for listed plants, (50 Code Fed. Regs., Section 17.11) for listed animals, and various notices in the Federal Register for proposed species;
- species that are candidates for possible future listing as threatened or endangered under the ESA (75 Code Fed. Regs., Section 69222);

- species that are listed or proposed for listing by the State of California as threatened or endangered under the CESA of 1984 (14 Cal. Code Regs., Section 670.5);
- plants considered by California Department of Fish and Wildlife (CDFW) and CNPS to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1A, 1B, 2A, and 2B; CNDDB 2018; CNPS 2017);
- species that meet the definition of rare or endangered under the California Environmental Quality Act (CEQA) Guidelines, Section 15380;
- animals fully protected in California (Fish and Game Code, Section 3511 for birds, Section 4700 for mammals, and Section 5050 for reptiles and amphibians); or
- animal species of special concern to CDFW.

A list of special-status species that could potentially occur on the project site or immediate vicinity was developed primarily through review of the CNDDB (CNDDB 2018) and the CNPS Inventory (CNPS 2018) records of previously documented occurrences of special-status species in the Allendale, Dixon, Saxon, Elmira, Dozier, Liberty Island, Denverton, Birds Landing, and Rio Vista U.S. Geological Survey 7.5-minute quadrangles.

Special-Status Plants

Table 4.4-2 provides a list of the special-status plant species that have been documented on the project site or the CNDDB five-mile search area, and describes their regulatory status, habitat, and potential for occurrence in the project site. A total of 23 special-status plant species have potential to occur within the project site (Table 4.4-2). These species include Ferris' milk-vetch (*Astragalus tener* var. *ferrisiae*), alkali milk-vetch (*Astragalus tener* var. *tener*), heartscale (*Atriplex cordulata* var. *cordulata*), brittlescale (*Atriplex depressa*), vernal pool smallscale (*Atriplex persistens*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), pappose tarplant (*Centromadia parryi* ssp. *parryi*), hispid salty bird's-beak (*Chloropyron molle* ssp. *hispidum*), recurved larkspur (*Delphinium recurvatum*), dwarf downingia (*Downingia pusilla*), Jepson's coyote-thistle (*Eryngium jepsonii*), San Joaquin spearscale (*Extriplex joaquinana*), fragrant fritillary (*Fritillaria liliacea*), Bogg's Lake hedge-hyssop (*Gratiola heterosepala*), Carquinez goldenbush (*Isocoma arguta*), legenere (*Legenere limosa*), Heckard's pepper-grass (*Lepidium latipes* var. *heckardii*), marsh microseris (*Microseris paludosa*), Baker's navarretia (*Navarretia leucocephala* ssp. *baker*), bearded popcornflower (*Plagiobothrys hystriculus*), California alkali grass (*Puccinellia simplex*), Sanford's arrowhead (*Sagittaria sanfordii*), and saline clover (*Trifolium hydrophilum*).

Creation	Listing Status ¹			l labitat	Detecticities Occurrence?			
species	Federal	State	CRPR		Potential for Occurrence-			
Ferris' milk-vetch Astragalus tener var. ferrisiae			1B.1	Wetland. Meadows and seeps, valley and foothill grassland. Subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil. 16 to 246 ft in elevation. Blooms April-May.	Could occur. The nearest known occurrence of this species is approximately 5 miles northeast of the project site (CNDDB 2018). The project site contains potentially suitable grassland habitat.			
alkali milk-vetch Astragalus tener var. tener			1B.2	Wetland. Alkali playa, valley and foothill grassland, vernal pools. Low ground, alkali flats, and flooded lands; in annual grassland or in playas or vernal pools. 0 to 551 ft in elevation. Blooms March-June.	Likely to occur. This species was observed within the project site during focused special- status plant surveys (ESA 2016d).			
heartscale Atriplex cordulata var. cordulata			1B.2	Chenopod scrub, valley and foothill grassland, meadows and seeps. Alkaline flats and scalds in the Central Valley, sandy soils. 10 to 902 ft in elevation. Blooms April- October.	Likely to occur. This species was observed within the project site during focused special- status plant surveys (ESA 2016d).			
brittlescale Atriplex depressa			1B.2	Alkali playa, wetland. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, vernal pools. Usually in	Could occur. The nearest known occurrence of this species is approximately 2.5 miles south of the project site (CNDDB 2018). Suitable vernal			

Table 4.4-2Special-Status Plant Species Known to Occur in the Project Region and their Potential for
Occurrence in the Project Site

Canadian	Listi	ng Stati	us ¹	11-bit-st	Detertial for One man or?
Species	Federal	State	CRPR	Haditat	Potential for Occurrence-
				alkali scalds or alkaline clay in meadows or annual grassland; rarely associated with riparian, marshes, or vernal pools. 3 to 1,066 ft in elevation. Blooms April-October.	pool and grassland habitat is present within the project site.
vernal pool smallscale Atriplex persistens			1B.2	Vernal pools, wetland. Alkaline vernal pools. 10 to 377 ft in elevation. Blooms June- October.	Could occur. The nearest known occurrence of this species is approximately 3 miles south of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool habitat for this species.
round-leaved filaree California macrophylla			1B.2	Cismontane woodland, valley and foothill grassland. Clay soils. 49 to 3,937 ft in elevation. Blooms March-May.	Not expected to occur. The project site is outside of the elevation range of this species.
Congdon's tarplant Centromadia parryi ssp. congdonii			1B.1	Valley and foothill grassland. Alkaline soils, sometimes described as heavy white clay. 0 to 755 ft in elevation. Blooms May- November.	Could occur. The nearest known occurrence of Congdon's tarplant is approximately 9.7 miles southwest of the project site (CNPS 2018). The project site contains potentially suitable grassland habitat for this species.
pappose tarplant Centromadia parryi ssp. parryi			1B.2	Chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley and foothill grassland. Vernally mesic, often alkaline sites. 7 to 1,378 ft in elevation. Blooms May- November.	Could occur. The nearest known occurrence of pappose tarplant is approximately 7.8 miles south of the project site (CNPS 2018). The project site contains potentially suitable grassland and vernal pool habitat for this species.
hispid salty bird's-beak Chloropyron molle ssp. hispidum			1B.1	Alkali playa, wetland. Meadows and seeps, playas, valley and foothill grassland. In damp alkaline soils, especially in alkaline meadows and alkali sinks with <i>Distichlis</i> . 3 to 509 ft in elevation. Blooms June-September.	Could occur. The nearest known occurrence of hispid salty bird's beak is approximately 3.5 miles south of the project site (CNPS 2018). The project site contains potentially suitable grassland habitat for this species.
soft salty bird's-beak Chloropyron molle ssp. molle	FE		1B.2	Wetland. Coastal salt marsh. In coastal salt marsh with <i>Distichlis, Salicornia, Frankenia,</i> etc. 0 to 16 ft in elevation. Blooms July- November.	Not expected to occur. The project site does not contain salt marsh habitat.
Bolander's water- hemlock <i>Cicuta maculata</i> var. <i>bolanderi</i>			2B.1	Salt marsh, Wetland. Marshes and swamps, fresh or brackish water. 0 to 656 ft in elevation. Blooms July-September.	Not expected to occur. Suitable salt marsh habitat is not present within the project site.
Suisun thistle Cirsium hydrophilum var. hydrophilum	FE		1B.1	Salt marsh, Wetland. Marshes and swamps. Grows with <i>Scirpus</i> , <i>Distichlis</i> near small watercourses within saltmarsh. 0 to 3 ft in elevation. Blooms June-September.	Not expected to occur. Suitable salt marsh habitat is not present within the project site.
recurved larkspur Delphinium recurvatum			1B.2	Chenopod scrub, valley and foothill grassland, cismontane woodland. On alkaline soils; often in valley saltbush or valley chenopod scrub. 10 to 2,592 ft in elevation. Blooms March-June.	Could occur. The nearest known occurrence of recurved larkspur is approximately 4.7 miles west of the project site. The project site contains potentially suitable grassland habitat for this species.
dwarf downingia Downingia pusilla			2B.2	Wetland. Valley and foothill grassland (mesic sites), vernal pools. Vernal lake and pool margins with a variety of associates. In several types of vernal pools. 3 to 1,608 ft in elevation. Blooms March-May.	Could occur. The nearest known occurrence of this species is approximately 1.8 miles southwest of the project site (CNDDB 2018). Suitable vernal pool and grassland habitat is present within the project site.
Jepson's coyote-thistle Eryngium jepsonii			1B.2	Vernal pools, valley and foothill grassland. Clay. 10 to 984 ft in elevation. Blooms April- August.	Could occur. The nearest known occurrence of Jepson's coyote-thistle is less than one mile east of the project site (CNPS 2018). The project site contains potentially suitable vernal pool and grassland habitat for this species.

Canadian	Listi	ng Statu	ıs ¹	Linking	Deterrial for Operation of
Species	Federal	State	CRPR	Habitat	
San Joaquin spearscale Extriplex joaquinana			1B.2	Alkali playa. Chenopod scrub, alkali meadow, playas, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with <i>Distichlis spicata</i> , <i>Frankenia</i> , etc. 3 to 2,740 ft in elevation. Blooms April-October.	Could occur. The nearest know occurrence of this species is approximately 3.8 miles east of the project site (CNDDB 2018). The project site contains potentially suitable grassland habitat for this species.
fragrant fritillary Fritillaria liliacea			1B.2	Coastal scrub, valley and foothill grassland, coastal prairie, cismontane woodland. Often on serpentine; various soils reported though usually on clay, in grassland. 10 to 1,312 ft in elevation. Blooms February-April.	Could occur. The nearest known occurrence of this species is approximately 1.8 miles south of the project site (CNDDB 2018). The project site contains potentially suitable grassland habitat for this species.
adobe-lily Fritillaria pluriflora			1B.2	Ultramafic. Chaparral, cismontane woodland, foothill grassland. Usually on clay soils; sometimes serpentine. 148 to 3,100 ft in elevation. Blooms February-April.	Not expected to occur. The project site is outside of the elevation range of this species and does not contain suitable habitat.
Boggs Lake hedge- hyssop Gratiola heterosepala		SE	1B.2	Wetland. Marshes and swamps (freshwater), vernal pools. Clay soils; usually in vernal pools, sometimes on lake margins. 33 to 7,792 ft in elevation. Blooms April-August.	Could occur. The nearest known occurrence of this species is approximately 1.8 miles southeast of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool habitat.
woolly rose-mallow Hibiscus lasiocarpos var. occidentalis			1B.2	Wetland. Marshes and swamps (freshwater). Moist, freshwater-soaked river banks and low peat islands in sloughs; can also occur on riprap and levees. In California, known from the delta watershed. 0 to 509 ft in elevation. Blooms June-September.	Not expected to occur. The project site does not contain suitable river bank or marsh habitat for this species.
Carquinez goldenbush Isocoma arguta			1B.1	Valley and foothill grassland. Alkaline soils, flats, lower hills. On low benches near drainages and on tops and sides of mounds in swale habitat. 3 to 164 ft in elevation. Blooms August-December.	Could occur. The nearest known occurrence is approximately 2 miles north of the project site (CNDDB 2018). Potentially suitable grassland habitat is present within the project site.
Northern California black walnut <i>Juglans hindsii</i>			1B.1	Riparian forest, riparian woodland. Few extant native stands remain; widely naturalized. Deep alluvial soil, associated with a creek or stream. 0 to 2,100 ft in elevation. Blooms April-May.	Not expected to occur. The project site does not contain riparian forest or woodland habitat. Norther California black walnut has not been observed on the project site during site surveys.
Contra Costa goldfields Lasthenia conjugens	FE		1B.1	Alkali playa, wetland. Valley and foothill grassland, vernal pools, alkaline playas, cismontane woodland. Vernal pools, swales, low depressions, in open grassy areas. 3 to 1,476 ft in elevation. Blooms March-June.	Not expected to occur. The nearest known occurrence of Contra Costa goldfields is approximately 4.7 miles west of the project site (CNPS 2018). The project site contains potentially suitable grassland and vernal pool habitat for this species. However, a focused survey of the project site for Contra Costa goldfields was conducted in 2017, and the species was not observed (ESA 2017c).
Delta tule pea Lathyrus jepsonii var. jepsonii			1B.2	Wetland. Freshwater and brackish marshes. Often found with <i>Typha</i> , <i>Aster lentus</i> , <i>Rosa californica</i> , <i>Juncus</i> sp., <i>Scirpus</i> , etc. Usually on marsh and slough edges. 0 to 16 ft in elevation. Blooms May-September.	Not expected to occur. The project site does not contain suitable marsh habitat for this species.
legenere Legenere limosa			1B.1	Vernal pools, wetland. In beds of vernal pools. 3 to 2,887 ft in elevation. Blooms April-June.	Could occur. The nearest known occurrence of this species is approximately 2.2 miles south of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool habitat for this species.

Creation	Listi	ng Statu	JS ¹	Linking	Datastic for Occurrence ²
species	Federal	State	CRPR	Habitat	Potential for Occurrence-
Heckard's pepper-grass Lepidium latipes var. heckardii			1B.2	Valley and foothill grassland, vernal pools. Grassland, and sometimes vernal pool edges. Alkaline soils. 3 to 98 ft in elevation. Blooms March-May.	Could occur. The nearest known occurrence of this species is approximately 3.4 miles southwest of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool and grassland habitat.
Mason's lilaeopsis Lilaeopsis masonii			1B.1	Wetland. Freshwater and brackish marshes, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. 0 to 33 ft in elevation. Blooms April-November.	Not expected to occur. The project site does not contain suitable marsh or river bank habitat for this species.
Delta mudwort Limosella australis			2B.1	Wetland. Riparian scrub, marshes and swamps. Usually on mud banks of the Delta in marshy or scrubby riparian associations; often with <i>Lilaeopsis masonii</i> . 0 to 16 ft in elevation. Blooms May-August.	Not expected to occur. The project site does not contain suitable riparian or marsh habitat for this species.
marsh microseris Microseris paludosa			1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. 16 to 984 ft in elevation. Blooms April-July.	Could occur. The nearest known occurrence of marsh microseris is approximately 9 miles southwest of the project site (CNPS 2018). The project site contains potentially suitable grassland habitat for this species.
Baker's navarretia Navarretia leucocephala ssp. bakeri			1B.1	Wetland. Cismontane woodland, meadows and seeps, vernal pools, valley and foothill grassland, lower montane coniferous forest. Vernal pools and swales; adobe or alkaline soils. 16 to 5,709 ft in elevation. Blooms April-July.	Could occur. The nearest known occurrence of this species is approximately 1.8 miles southeast of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool and grassland habitat.
Colusa grass Neostapfia colusana	FT	SE	1B.1	Vernal pools, wetland. Usually in the bottoms of large, or deep vernal pools; adobe soils. 16 to 410 ft in elevation. Blooms May-August.	Not expected to occur. The project site does not contain large, deep, adobe vernal pool habitat.
San Joaquin Valley Orcutt grass Orcuttia inaequalis	FT	SE	1B.1	Vernal pools, wetland. 33 to 2,477 ft in elevation. Blooms April-September.	Not expected to occur. This species requires deep vernal pools with a long period of inundation. The vernal pools within the project site are shallow and have a relatively short hydroperiod, and thus are not suitable for this species.
bearded popcornflower Plagiobothrys hystriculus			1B.1	Wetland. Vernal pools, valley and foothill grassland. Wet sites. 0 to 902 ft in elevation. Blooms April-May.	Could occur. The nearest known occurrence of this species is approximately 1.5 miles southeast of the project site (CNDDB 2018). Suitable vernal pool and grassland habitat is present within the project site.
California alkali grass Puccinellia simplex			1B.2	Meadows and seeps, chenopod scrub, valley and foothill grasslands, vernal pools. Alkaline, vernally mesic. Sinks, flats, and lake margins. 3 to 3,002 ft in elevation. Blooms March-May.	Could occur. The nearest known occurrence of this species is approximately 1.5 miles south of the project site (CNDDB 2018). The project site contains potentially suitable vernal pool and grassland habitat for this species.
Sanford's arrowhead Sagittaria sanfordii			1B.2	Wetland. Marshes and swamps. In standing or slow-moving freshwater ponds, marshes, and ditches. 0 to 2,133 ft in elevation. Blooms May-November.	Could occur. The nearest known occurrence of Sanford's arrowhead is approximately 9.7 miles southeast of the project site (CNPS 2018). The project site contains potentially suitable habitat within ditches for this species.

Cardina	Listi	ng Stati	us ¹	11.1.9.4	
Species	Federal	State	CRPR	Habitat	Potential for Occurrence ²
Keck's checkerbloom Sidalcea keckii	FE		1B.1	Ultramafic. Cismontane woodland, valley and foothill grassland. Grassy slopes in blue oak woodland. On serpentine-derived, clay soils, at least sometimes. 279 to 1,657 ft in elevation. Blooms April-June.	Not expected to occur. The project site is outside of the elevation range of this species.
Suisun Marsh aster Symphyotrichum lentum			1B.2	Wetland. Marshes and swamps (brackish and freshwater). Most often seen along sloughs with <i>Phragmites</i> , <i>Scirpus</i> , blackberry, <i>Typha</i> , etc. 0 to 98 ft in elevation. Blooms April-November.	Not expected to occur. The project site does not contain suitable marsh or swamp habitat for this species.
two-fork clover Trifolium amoenum	FE		1B.1	Valley and foothill grassland, coastal bluff scrub. Sometimes on serpentine soil, open sunny sites, swales. Most recently sighted on a roadside and eroding cliff face. 16 to 1,017 ft in elevation. Blooms April-June.	Not expected to occur. The nearest known historic occurrence (from 1909) of this species is approximately 5 miles northwest of the project site, in an area that is now urbanized (CNDDB 2018). This occurrence is presumed to be extirpated. There is otherwise no known population of this species within 5 miles of the project site.
saline clover Trifolium hydrophilum			1B.2	Wetland. Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. 0 to 984 ft in elevation. Blooms April-June.	Could occur. The nearest known occurrence of saline clover is approximately 5 miles northeast of the project site (CNPS 2018). The project site contains potentially suitable grassland and vernal pool habitat for this species.
Crampton's tuctoria or Solano grass <i>Tuctoria mucronata</i>	FE	SE	1B.1	Wetland. Vernal pools, valley and foothill grassland. Clay bottoms of drying vernal pools and lakes in valley grassland. 16 to 49 ft in elevation. Blooms April-August.	Not expected to occur. The nearest known occurrence of this species is approximately 2.5 miles south of the project site (CNDDB 2018). This species requires long periods of inundation within vernal pool habitats. The vernal pools within the project site have a relatively short hydroperiod, and are not suitable for this species.

Notes: CRPR = California Rare Plant Rank; CNDDB = California Natural Diversity Database

^{1.} Legal Status Definitions

Federal:

- E Endangered (legally protected by ESA)
- T Threatened (legally protected by ESA)
- C Candidate (legally protected by ESA)
- USFS-S US Forest Service Sensitive Species

State:

- E Endangered (legally protected by CESA)
- R Rare (legally protected by CNPPA)

California Rare Plant Ranks:

1B Plant species considered rare or endangered in California and elsewhere (protected under CEQA, but not legally protected under ESA or CESA) 2B Plant species considered rare or endangered in California but more common elsewhere (protected under CEQA, but not legally protected

under ESA or CESA)

Threat Ranks

0.1 Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)

0.2 Moderately threatened in California (20-80% occurrences threatened; moderate degree and immediacy of threat)

^{2.} Potential for Occurrence Definitions

Not expected to occur: Species is unlikely to be present on the project site due to poor habitat quality, lack of suitable habitat features, or restricted current distribution of the species.

Could occur: Suitable habitat is available at the project site; however, there are little to no other indicators that the species might be present. Likely to occur: The species, or evidence of its presence, was observed at the project site during reconnaissance surveys, or was reported by others. Sources: CNDDB 2018; CNPS 2018; Calflora 2018; ESA (2016d, 2017c)

Special-Status Wildlife

Table 4.4-3 provides a list of the special-status wildlife species that have been documented on the project site or the CNDDB 5-mile search area, and describes their regulatory status, habitat, and potential for occurrence in the project site. A total of 11 special-status wildlife species have potential to occur within the project site (Table 4.4-3). These species include California tiger salamander, burrowing owl, California black rail (*Laterallus jamaicensis coturniculus*), mountain plover (*Charadrius montanus*), northern harrier (*Circus cyaneus*), Swainson's hawk, tricolored blackbird (*Agelaius tricolor*), white-tailed kite (*Elanus leucurus*), conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), and giant garter snake (*Thamnophis gigas*).

Spacies	Listing S	Status ¹	Habitat	Potential for Occurrence ²
Species	Federal	State	Habitat	
Amphibians				
California tiger salamander <i>Ambystoma</i> <i>californiense</i>	FT	ST	Cismontane woodland, meadow and seep, riparian woodland, valley and foothill grassland, vernal pool, and wetlands. Central Valley DPS federally listed as threatened. Santa Barbara and Sonoma counties DPS federally listed as endangered. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.	Could occur. The nearest known occurrence of this species is approximately 1.5 miles southeast of the project site (CNDDB 2018). California tiger salamanders were not observed during a focused survey within the vernal pools on the project site (ESA 2016b, 2016c). However, suitable habitat is present within the project site, and California tiger salamanders could be present onsite seasonally (ESA 2016b).
giant garter snake <i>Thamnophis gigas</i>	FT	ST	Marsh and swamp, riparian scrub, wetland. Prefers freshwater marsh and low gradient streams. Has adapted to drainage canals and irrigation ditches. This is the most aquatic of the garter snakes in California.	Could occur. The nearest known occurrence of this species is approximately 5.5 miles northeast of the project site (CNDDB 2018). This most recent observation at this location took place in 1987, and the species has not been observed there since. A more recent observation (2017) of a dead giant garter snake occurred approximately 7.1 miles east of the project site (CNDDB 2018). The project site is within the historic range of this species, is hydrologically-connected to waters where giant garter snake have been observed and contains potentially suitable habitat for giant garter snake within drainage ditches that are hydrologically connected to other irrigation ditches in the area and the borrow pit.
Birds	<u> </u>			· · · · · · · · · · · · · · · · · · ·
burrowing owl Athene cunicularia		SSC	Coastal prairie, coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, and valley and foothill grassland. Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Could occur. The nearest known occurrence of this species is approximately 1.6 miles southwest of the project site (CNDDB 2018). While the project site does not contain many suitable burrows or populations of California ground squirrels, burrowing owls could colonize the site in the future.
California black rail Laterallus jamaicensis coturniculus		ST FP	Brackish marsh, freshwater marsh, marsh and swamp, salt marsh, wetland. Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Could occur. The nearest known occurrences of this species are approximately 3 to 4 miles southeast of the project site within sloughs near the Sacramento River Delta (CNDDB 2018). The Bird Sanctuary area adjacent to the project site contains potentially suitable nesting habitat for black rail within the thick tule and cattails.

Table 4.4-3Special-Status Wildlife Species Known to Occur in the Project Region and their Potential for
Occurrence in the Project Site

Species	Listing S	Status ¹	Habitat	Potential for Occurrence ²				
mountain plover Charadrius montanus	receral	SSC	Chenopod scrub, valley and foothill grassland. Short grasslands, freshly plowed	Could occur. The nearest known occurrence of this species is approximately 4.5 miles south of the project site				
			fields, newly sprouting grain fields, and sometimes sod farms. Short vegetation, bare ground and flat topography. Prefers grazed	(CNDDB 2018). The project site contains potentially suitable grassland habitat for this species.				
northorn barriar		550	areas and areas with burrowing rodents.	Could accur There have been many recent accurrences of				
Circus cyaneus		330	and swamp, riparian scrub, valley and foothill grassland, and wetlands. Coastal salt and fresh- water marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	this species within approximately 1 mile of the project site (eBird 2017). Potentially suitable grassland nesting habitat is present within and adjacent to the project site.				
Swainson's hawk Buteo swainsoni		ST	Great Basin grassland, riparian forest, riparian woodland, valley and foothill grassland. Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands with groves or lines of trees. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	Could occur. There have been several recent occurrences within one mile of the project site (eBird 2017). The project site does not contain any suitable trees for Swainson's hawk nesting; however, there are several suitable, large trees approximately 0.5 mile south of the project site. Swainson's hawks have historically (2005) nested within these trees (CNDDB 2018). This species could use the habitat within the project site for foraging.				
tricolored blackbird Agelaius tricolor		CE SSC	Freshwater marsh, marsh and swamp, swamp, wetland. Highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Likely to occur. This species has been observed nesting within the Bird Sanctuary area adjacent to the project site, as well as within another aquatic area on Recology property approximately 0.5 mile west of the project site (CNDDB 2018).				
white-tailed kite Elanus leucurus		FP	Cismontane woodland, marsh and swamp, riparian woodland, valley and foothill grassland, and wetlands. Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense- topped trees for nesting and perching.	Could occur. There have been several recent occurrences of this species within approximately 1 mile of the project site (eBird 2017). Potentially suitable nest trees are present approximately 0.5 mile south of the project site.				
Fish			-					
longfin smelt Spirinchus thaleichthys	FC	SSC	Aquatic, estuary. Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt but can be found in completely freshwater to almost pure seawater.	Not expected to occur. The nearest known occurrence of this species is approximately 4.6 miles southeast of the project site within a tributary to the Sacramento River Delta. The project site does not contain any aquatic habitat that feeds into the Sacramento River Delta.				
Invertebrates								
conservancy fairy shrimp Branchinecta conservatio	FE		Valley and toothill grassland, vernal pool, wetland. Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	Could occur. While the species has not been observed within the project site, a focused survey could not rule out the presence of conservancy fairy shrimp (ESA 2016c). The species has been observed within the property adjacent to the project site approximately 1.4 miles to the south (CNDDB 2018). Suitable habitat within the project site includes the large playa pool.				

Creation	Listing S	Status ¹	11-1-2-4	Detertial for Occurrence ²
Species	Federal	State	Haditat	
Delta green ground beetle <i>Elaphrus viridis</i>	FT		Vernal pool, wetland. Restricted to the margins of vernal pools in the grassland area between Jepson Prairie and Travis Air Force Base. Prefers the sandy mud substrate where it slopes gently into the water, with low-growing vegetation, 25-100 percent cover.	Not expected to occur. This species has been observed during focused surveys within the project site (Entomological Consulting Services, Ltd. 2016). However, the beetles that were observed were adjacent to the southern end of the large playa pool on the project site, which represents typical suitable habitat for the species (i.e., large, deep pools with patches of bare ground). The vernal pools present within the Triangle did not provide suitable habitat for Delta green ground beetle, because these vernal pools are shallow with short hydroperiods and dense vegetative growth (Entomological Consulting Services, Ltd. 2018).
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	FT		Valley and foothill grassland, vernal pool, wetland. Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain- filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	Likely to occur. This species has been observed within vernal pools on the project site (ESA 2016c).
vernal pool tadpole shrimp Lepidurus packardi	FE		Valley and foothill grassland, vernal pool, wetland. Inhabits vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. Po01ols commonly found in grass bottomed swales of unplowed grasslands. Some pools are mud- bottomed and highly turbid.	Likely to occur. This species has bene observed within vernal pools on the project site (ESA 2016c).

Note: CNDDB = California Natural Diversity Database

^{1.} Legal Status Definitions

Federal:

- E Endangered (legally protected)
- T Threatened (legally protected)
- D Delisted
- C Candidate

State:

- D Delisted
- FP Fully protected (legally protected)
- SSC Species of special concern (no formal protection other than CEQA consideration)
- E Endangered (legally protected)
- T Threatened (legally protected)
- C Candidate
- ^{2.} Potential for Occurrence Definitions

Not expected to occur: Species is unlikely to be present in the project area due to poor habitat quality, lack of suitable habitat features, or restricted current distribution of the species.

Could occur: Suitable habitat is available in the project area; however, there are little to no other indicators that the species might be present.

Likely to occur: The species, or evidence of its presence, was observed in the project area during reconnaissance surveys, or was reported by others.

Source: CNDDB 2018; eBird 2017; ESA (2016a, 2016b, 2016c, 2017b); Entomological Consulting Services Ltd. (2016, 2018)

SENSITIVE HABITATS

Sensitive Natural Communities

Sensitive natural communities include those that are of special concern to resource agencies or are afforded specific consideration through CEQA or other federal or State laws. Sensitive natural communities may be of special concern to regulatory agencies and conservation organizations for a variety of reasons, including their locally or regionally declining status, or because they provide important habitat to common and special-status species. Many of these communities are tracked in CDFW's CNDDB. There are three sensitive natural communities within five miles of the project site, which have potential to occur within the project site.

Coastal and Valley Freshwater Marsh

Coastal and valley freshwater marsh are typically areas with permanent flooding dominated by tall, perennial vegetation such as tule (*Scirpus* sp.) and cattail (*Typha* sp.). approximately 4 miles south of the project site adjacent to a tributary to the Sacramento River Delta (CNDDB 2018). The bird sanctuary area within the project site may be considered marsh habitat, because it contains water year-round and contains marsh vegetation including tule and cattail.

Northern Claypan Vernal Pool

Northern claypan vernal pools are shallow, ephemeral waterbodies found in depressions among grasslands and open woodlands in the northern Central Valley of California. These pools include a clay hardpan that retains water throughout some portion of the spring and typically dry down completely in the early summer months. Northern claypan vernal pools are often alkaline and slightly saline, and contain characteristic plant species, including endemic species or state and federally-listed species. The project site contains approximately 75 acres of northern claypan vernal pool habitat within the Triangle and Eastern Mitigation Areas, and there are several other occurrences within a 5-mile radius of the project site (CNDDB 2018).

Valley Needlegrass Grassland

Valley needlegrass grassland is associated with two needlegrass species: purple needle grass (*Stipa pulchra*) and nodding needle grass (*Stipa cernua*). There are several occurrences of valley needlegrass grassland within approximately 1 mile of the project site (CNDDB 2018); however, needle grass was not observed during the 2016 special-status plant survey during which a full inventory of plant species was conducted (ESA 2016d).

WILDLIFE MOVEMENT CORRIDORS

The California Essential Habitat Connectivity Project is an effort to identify large remaining blocks of intact habitat or natural landscape blocks in California, and to model linkages between them; primarily for wildlife movement (Spencer et al. 2010). The project site contains portions of larger surrounding natural landscape blocks, primarily within the Triangle and Western and Eastern Mitigation Areas (Figure 4.4-2). The project site is not located within any defined Essential Connectivity Area (Figure 4.4-2).

FEDERAL DESIGNATED CRITICAL HABITAT

The project site is not within but is adjacent to critical habitat for the Delta green ground beetle, vernal pool tadpole shrimp, and vernal pool fairy shrimp (Figure 4.4-3).





Figure 4.4-3 Critical Habitat



4.4.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

The following standards of significance are based on Appendix G of the CEQA Guidelines. For purposes of this SEIR, the proposed project would result in a potentially new significant impact, or substantial increase in a previously identified significant impact, with regard to biological resources if it would:

- result in a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species (as defined above) in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- result in a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;
- result in a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- conflict with any local applicable policies protecting biological resources; or
- conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan (NCCP), or other applicable HCP.

METHODOLOGY

The analysis of potential impacts to biological resources resulting from project implementation is based on review of existing databases and reports regarding natural resources in the project site described previously in Section 4.4.2, "Environmental Setting."

ISSUES NOT DISCUSSED FURTHER

Certain Special-status Species

Mountain plovers do not nest in California; however, wintering plovers are considered species of special concern in California by CDFW. There have been several observations of mountain plover within 5 miles of the project site; however, the project site does not contain suitable habitat for this species (e.g., recently burned fields, alkali flats, grasslands heavily grazed by domestic livestock), and it is unlikely that mountain plovers would winter on the site. This issue is not analyzed further in this SEIR.

Consistency with Solano MSHCP

The project site is within Zone 3 of the Solano MSHCP area. Solano County is not a participant in the MSHCP, and thus projects within unincorporated Solano County are not subject to the MSHCP provisions. Additionally, while a final draft of the MSHCP and its EIS/EIR has been released, the MSHCP has not yet been adopted. Because the MSHCP is not an approved plan and Solano County is not a participant in the plan, no conflicts with adopted plans would occur and there would be no impact. This issue is not analyzed further in this SEIR.

IMPACTS AND MITIGATION MEASURES

Impact 4.4-1: Potential Impacts to Special-Status Plants

Project construction activities, including ground disturbance and vegetation removal, could result in disturbance to or loss of special-status plants if present on the project site. Because the loss of special-status plants could substantially affect the abundance, distribution, and viability of local and regional populations of these species, this would be a **significant** impact.

A total of 23 special-status plant species have the potential to occur within the project site (Table 4.4-2). These species include Ferris' milk-vetch, alkali milk-vetch, heartscale, brittlescale, vernal pool smallscale, Congdon's tarplant, pappose tarplant, hispid salty bird's-beak, recurved larkspur, dwarf downingia, Jepson's coyote-thistle, San Joaquin spearscale, fragrant fritillary, Bogg's Lake hedge-hyssop, Carquinez goldenbush, legenere, Heckard's pepper-grass, marsh microseris, Baker's navarretia, bearded popcornflower, California alkali grass, Sanford's arrowhead, and saline clover. Bogg's Lake hedge-hyssop is listed as endangered under CESA. The remaining 22 special-status plant species have California Rare Plant Rankings ranging from 1B.1 to 2B.2. Project construction activities, including vegetation removal and ground disturbance, could result in disturbance or removal of special-status plants if present. The loss of special-status plants and their habitat associated with the lateral expansion of the landfill's disposal area could substantially affect the abundance, distribution, and viability of local and regional populations of these species. This would be a **significant** impact.

Mitigation Measures

Mitigation Measure 4.4-1a: Special-Status Plant Surveys

Prior to commencement of ground disturbance within habitats in the Triangle where special-status plants may occur (i.e., grassland habitat, vernal pool habitat), and during the blooming period for the special-status plants with potential to occur on the sites (Table 4.4-4), a qualified botanist will conduct protocol-level surveys for the potentially occurring special-status plants that could be removed or disturbed by project activities. Protocol-level surveys will be conducted in accordance with Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFW 2009). If special-status plants are not found, the botanist will document the findings in a letter report to CDFW and further mitigation will not be required.

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Ferris' milk-vetch Astragalus tener var. ferrisiae												
alkali milk-vetch Astragalus tener var. tener												
heartscale Atriplex cordulata var. cordulata												
brittlescale Atriplex depressa												
vernal pool smallscale Atriplex persistens												
Congdon's tarplant Centromadia parryi ssp. congdonii												
pappose tarplant Centromadia parryi ssp. parryi												
hispid salty bird's-beak Chloropyron molle ssp. hispidum												

Table 4.4-4	Normal Blooming	Period for Special	-Status Plants with	Potential to Occu	r Within the Triangle

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
recurved larkspur Delphinium recurvatum												
dwarf downingia <i>Downingia pusilla</i>												
Jepson's coyote-thistle Eryngium jepsonii												
San Joaquin spearscale Extriplex joaquinana												
Fragrant fritillary <i>Fritillaria liliacea</i>												
Bogg's Lake hedge-hyssop Gratiola heterosepala												
Carquinez goldenbush Isocoma arguta												
Legenere Legenere limosa												
Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>												
marsh microseris <i>Microseris paludosa</i>												
Baker's navarretia <i>Navarretia leucocephala</i> ssp. <i>bakeri</i>												
Bearded popcornflower Plagiobothrys hystriculus												
California alkali grass Puccinellia simplex												
Sanford's arrowhead Sagittaria sanfordii												
saline clover Trifolium hydrophilum												

Source: Data compiled by Ascent Environmental in 2018, Calflora 2018

Mitigation Measure 4.4-1b: Special-Status Plant Avoidance

If special-status plant species are found on the project site and are located outside of the permanent footprint of any proposed structures/site features and can be avoided, the project applicant will establish and maintain a protective buffer around special-status plants to be retained.

Mitigation Measure 4.4-1c: Special-Status Plant Impact Minimization Measures

If special-status plants are found during rare plant surveys and cannot be avoided, the project applicant will consult with CDFW and USFWS, as appropriate depending on species status, to determine the appropriate compensation to achieve no net loss of occupied habitat or individuals. Mitigation measures may include, but are not limited to, preserving and enhancing existing populations, creating offsite populations on mitigation sites through seed collection or transplantation at a 1:1 ratio, and restoring or creating suitable habitat in sufficient quantities to achieve no net loss of occupied habitat or individuals. Potential mitigation sites could include suitable locations within or outside of the campus. The project applicant will develop and implement a site-specific mitigation strategy describing how unavoidable losses of special-status plants will be compensated. Success criteria for preserved and compensatory populations will include:

- The extent of occupied area and plant density (number of plants per unit area) in compensatory populations will be equal to or greater than the affected occupied habitat. Compensatory and preserved populations will be self-producing. Populations will be considered self-producing when:
 - plants reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and
 - reestablished and preserved habitats contain an occupied area and flower density comparable to existing
 occupied habitat areas in similar habitat types in the project vicinity.

If offsite mitigation includes dedication of conservation easements, purchase of mitigation credits, or other offsite conservation measures, the details of these measures will be included in the mitigation plan, including information on responsible parties for long-term management, conservation easement holders, long-term management requirements, success criteria such as those listed above and other details, as appropriate to target the preservation of long term viable populations.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-1a through 4.4-1c would reduce significant impacts on special-status plants to a **less-than-significant** level because it would require identification and avoidance of special-status plants or provide compensation for loss of special-status plants through enhancement of existing populations, creation and management of offsite populations, conservation easements, or other appropriate measures.

Impact 4.4-2: Potential impacts to Special-status Wildlife

Construction activities, such as ground disturbance, grading, and vegetation removal could result in the disturbance to several special-status wildlife species, including California tiger salamander, giant garter snake, burrowing owl, California black rail, northern harrier, Swainson's hawk, tricolored blackbird, white-tailed kite, special-status branchiopods, and Delta green ground beetle. The loss of special-status wildlife species and their habitat would be a **potentially significant** impact.

A total of 11 special-status wildlife species have potential to occur within the project site and to be adversely affected by project implementation (Table 4.4-3). These species include California tiger salamander, giant garter snake, burrowing owl, California black rail, northern harrier, Swainson's hawk, tricolored blackbird, white-tailed kite, conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp.

Project activities including ground disturbance, grading, vegetation removal, and presence of construction vehicles, trucks, and personnel could result in disturbance or direct loss of these special-status species. Potential effects of project implementation on special-status wildlife species known of with potential to occur within the project site are discussed below.

California Tiger Salamander

California tiger salamander is listed as threatened under ESA and CESA. A habitat assessment for California tiger salamander was conducted within the project site in 2016, and it was determined that the project site contains potentially suitable aquatic breeding and upland habitat for this species (ESA 2016b). No California tiger salamanders were observed incidentally in the project site during focused branchiopod surveys (ESA 2016c). However, because potentially suitable habitat is present within the site, it is possible that the species could be present. Project activities, including ground disturbance, vegetation removal, grading, and permanent conversion of vernal pool and grassland habitat could result in disturbance or direct loss of California tiger salamander if present, and reduction of suitable habitat for the species in the region. This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-2a: California Tiger Salamander Avoidance and Compensatory Mitigation for Habitat Loss

Prior to deepening and widening of the borrow pit and commencement of ground-disturbing activities within suitable habitat for California tiger salamander (i.e., grassland, vernal pools), the project applicant will implement the following measures to avoid direct loss of California tiger salamanders if present within the project site.

- A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.
- ► A USFWS-approved biologist will conduct a pre-construction survey of the project site no more than two weeks before commencement of project construction activities.
- When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for California tiger salamander. Burrows considered suitable for California tiger salamander will be determined by a qualified biologist, approved by USFWS.
- All suitable burrows directly impacted by construction will be hand excavated under the supervision of a qualified wildlife biologist. If California tiger salamanders are found, the biologist will relocate the organism to the nearest burrow that is outside of the construction impact area.
- ► For work conducted during the California tiger salamander migration season (November 1 to May 31), exclusionary fencing will be erected around the construction site during ground-disturbing activities after hand excavation of burrows has been completed. A qualified biologist will visit the site weekly to ensure that the fencing is in good working condition. Fencing material and design will be subject to the approval of the USFWS. If exclusionary fencing is not used, a qualified biological monitor will be onsite during all ground disturbance activities. Exclusion fencing will also be placed around all spoils and stockpiles.
- For work conducted during the California tiger salamander migration season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the biologist has confirmed that no California tiger salamander are in the work area.
- Prior to beginning work each day, underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter will be inspected for California tiger salamander. If any are found, they will be allowed to move out of the construction area under their own accord.
- Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than 1 foot will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.
- ► All food and food-related trash will be enclosed in sealed trash containers at the end of each workday and removed completely from the construction site once every three days to avoid attracting wildlife.
- A speed limit of 15 mph will be maintained on dirt roads.
- All equipment will be maintained such that there are no leaks of automotive fluids such as fuels, oils, and solvents. Any fuel or oil leaks will be cleaned up immediately and disposed of properly.
- Plastic monofilament netting (erosion control matting) or similar material will not be used at the Project site because California tiger salamander may become entangled or trapped. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.
- ► Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 100 feet from aquatic habitat. If it is not feasible to store hazardous materials 100 feet from wetlands and the river channel, then spill containment measures will be implemented to prevent the possibility of accidental discharges to wetlands and waters.

• The applicant shall secure any necessary take authorization prior to project construction through formal consultation with USFWS pursuant to Section 7 of the ESA.

Prior to commencement of ground-disturbing activities within suitable habitat for California tiger salamander in the Triangle (i.e., grassland and vernal pools within the landfill expansion area), the project applicant will implement the following measures to compensate for loss of California tiger salamander habitat.

- The project applicant will provide suitable in-kind habitat that will be created, restored, and/ or set aside in perpetuity at a ratio of 3:1. Alternatively, credits will be purchased at a USFWS-approved conservation bank. Compensation plans will be subject to review and approval by USFWS. All compensation will be acquired or secured prior to the beginning of ground disturbance.
- ► In-kind habitat compensation will occur prior to initiation of ground or vegetation disturbance activities. Aquatic habitat will be provided for damage or loss of aquatic habitat and upland habitat will be provided for damage or loss of upland habitat. Compensation will be accomplished through the following options: 1) acquire land, by itself, or possibly in conjunction with a conservation organization, State park, State Wildlife Area, National Wildlife Refuge, or local regional park that provides occupied habitat; 2) purchase the appropriate credit units at a USFWS-approved conservation bank; 3) restore habitat to support the Central California tiger salamander; or 4) other method as determined by USFWS including participation within a HCP permit area.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2a would reduce impacts on California tiger salamander to a **less-than-significant** level because California tiger salamanders and their habitat would be avoided and protected from construction activities, and the project applicant would compensate for loss of suitable occupied habitat because of construction activities.

Giant Garter Snake

Giant garter snake is listed as threatened under ESA and CESA. There has been one recent (2017) observation of a dead giant garter snake approximately 7 miles east of the project site (CNDDB 2018). The project site contains potentially suitable habitat for giant garter snake within a drainage ditch that is potentially hydrologically connected to other irrigation ditches within the vicinity of the recent sighting, and within the borrow pit. Project activities, including removal and re-routing of the drainage ditch, ground disturbance, vegetation removal, and grading could result in disturbance or direct loss of giant garter snake if present. This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-2b: Protection of Giant Garter Snake

Prior to deepening and widening of the borrow pit and commencement of ground-disturbing activities within suitable aquatic (i.e., irrigation ditches) or upland habitat (i.e., grassland habitat) for giant garter snake in the Triangle, the project applicant will implement the following measures to avoid direct loss of giant garter snake if present within the project site.

For projects or ground-disturbing activities with potential to disturb suitable aquatic or adjacent upland habitat for giant garter snake, the following measures will be implemented.

- ► The applicant shall retain a qualified biologist to conduct a field investigation to delineate giant garter snake aquatic habitat within the project footprint and adjacent areas within 300 feet of the project footprint. Giant garter snake aquatic habitat includes agricultural ditches. A report summarizing the results of the delineation shall be submitted to the Solano County Department of Resource Management within 10 days of the delineation.
- During construction, an approved biologist experienced with giant garter snake identification and behavior shall be onsite daily when construction activities within aquatic habitat or within 300 feet of aquatic habitat are taking place. The biologist shall inspect the project site daily for giant garter snake prior to construction activities. The biologist

will also conduct environmental awareness training for all construction personnel working on the project site on required avoidance procedures and protocols if a giant garter snake enters an active construction zone.

- All construction activity within giant garter snake aquatic and upland habitat in and around the site shall be conducted between May 1 and September 15, the active period for giant garter snakes. This would reduce direct impacts on the species because the snakes would be active and respond to construction activities by moving out of the way.
- If construction activities occur in giant garter snake aquatic habitat (i.e., irrigation ditches, the borrow pit, other habitat identified during the delineation of habitat), aquatic habitat shall be dewatered and then remain dry and absent of aquatic prey (e.g., fish and tadpoles) for 15 days prior to initiation of construction activities. If complete dewatering is not possible, the project applicant shall consult with CDFW and USFWS to determine what additional measures may be necessary to minimize effects to giant garter snake. After aquatic habitat has been dewatered 15 days prior to construction activities, exclusion fencing shall be installed extending a minimum of 300 feet into adjacent uplands to isolate both the aquatic and adjacent upland habitat. Exclusionary fencing shall be erected 36 inches above ground and buried at least 6 inches below the ground to prevent snakes from attempting to move under the fence into the construction area. In addition, high-visibility fencing shall be erected to identify the construction limits and to protect adjacent habitat from encroachment of personnel and equipment. Giant garter snake habitat outside construction fencing shall be avoided by all construction personnel. The fencing and the work area shall be inspected by the approved biologist to ensure that the fencing is intact and that no snakes have entered the work area before the start of each work day. The fencing shall be maintained by the contractor until completion of the project.
- ► If a giant garter snake is observed, the biologist shall notify CDFW and USFWS immediately. Construction activities will be suspended in a 100-foot radius of the garter snake until the snake leaves the site on its own volition. If necessary, the biologist shall consult with CDFW and USFWS regarding appropriate procedures for relocation. If the animal is handled, a report shall be submitted, including date(s), location(s), habitat description, and any corrective measures taken to protect giant garter snake within 1 business day to CDFW and USFWS. The biologist shall report any take of listed species to USFWS immediately. Any worker who inadvertently injures or kills a giant garter snake or who finds one dead, injured, or entrapped must immediately report the incident to the approved biologist.
- All excavated steep-walled holes and trenches more than 6 inches deep shall be covered with plywood (or similar material) or provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each work day or 30 minutes prior to sunset, whichever occurs first. All steep-walled holes and trenches shall be inspected by the approved biologist each morning to ensure that no wildlife has become entrapped. All construction pipes, culverts, similar structures, construction equipment, and construction debris left overnight within giant garter snake modeled habitat shall be inspected for giant garter snake by the approved biologist prior to being moved.
- ► If erosion control is implemented on the project site, non-entangling erosion control material shall be used to reduce the potential for entrapment. Tightly woven fiber netting (mesh size less than 0.25 inch) or similar material will be used to ensure snakes are not trapped (no monofilament). Coconut coir matting and fiber rolls containing burlap are examples of acceptable erosion control materials.
- The applicant shall ensure that there is no-net-loss of giant garter snake habitat by compensating for loss of habitat at a ratio of 1:1, by purchasing credits from a USFWS-approved conservation bank.
- Prior to construction, USFWS shall be consulted pursuant to Section 7 of the ESA. The activities may qualify to use the "Programmatic Formal Consultation for U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California" (USFWS 1997). The Habitat Replacement & Restoration Guidelines (Appendix A), Items Necessary for Formal Consultation (Appendix B), Avoidance & Minimization Measures During Construction (Appendix C), and Monitoring Requirements (Appendix D) shall be followed.
Significance after Mitigation

Implementation of Mitigation Measure 4.4-2b would reduce impacts on giant garter snake to a **less-than-significant** level because giant garter snakes and habitat would be avoided and protected from construction activities, and the project applicant would compensate for loss of suitable occupied habitat because of construction activities.

Special-status Branchiopods

Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

Vernal pool fairy shrimp is listed as threatened under ESA, and vernal pool tadpole shrimp is listed as endangered under ESA. A branchiopod survey of the project site was conducted in 2016, and vernal pool fairy shrimp and vernal pool tadpole shrimp were detected within vernal pools on the project site (ESA 2016c). Project construction activities, including conversion of vernal pool habitat, ground disturbance, and vegetation removal, could result in disturbance or removal of vernal pool fairy shrimp and vernal pool tadpole shrimp and their habitat. This would be a **potentially significant** impact.

Conservancy fairy shrimp

Conservancy fairy shrimp is listed as endangered under ESA. Conservancy fairy shrimp was not detected during wet season surveys of the vernal pools, including the playa pool, on the project site; however, the species could not be ruled out due to the presence of *Branchinecta* cysts observed during the wet and dry seasons that could not be identified to the species level and therefore may be attributed to Conservancy fairy shrimp (ESA 2016c). Conservancy fairy shrimp prefer large, turbid playa-like vernal pools rather than small pools with short hydroperiods. Suitable habitat on the project site for this species includes the large playa pool, and likely does not include the smaller vernal pools on the project site. Project implementation would include conversion of the northern end of the large playa pool within the triangle. The northern end of the playa pool is shallower than the remaining majority of the pool, and likely does not exhibit the preferred conditions for Conservancy fairy shrimp (ESA 2017b). However, conversion of the large playa pool could result in indirect impacts to the playa pool, including introduction of sediments or changes in hydrology. This would be a **potentially significant** impact.

Guidance has been described in the *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans Within the Jurisdiction of the Sacramento Field Office, California* (USFWS 1996) (Programmatic Biological Opinion [BO]) for estimating impacts to vernal pool crustaceans and suitable habitat. In assessing impacts, both direct and indirect, to vernal pool crustaceans, the guidelines outlined in the Programmatic BO were used, even though the proposed action does not qualify for approval under the Programmatic BO because it would result in impacts greater than 1 acre.

Mitigation Measures

Mitigation Measure 4.4-2c: Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp Habitat Compensation for Direct Effects

The project applicant shall implement the following measures to minimize and compensate for loss of vernal pool fairy shrimp and vernal pool tadpole shrimp and suitable habitat prior to ground-disturbing activities.

The following mitigation shall occur prior to ground-disturbing activities and approval of improvement plans for the lateral expansion and any project phase that would allow work within 250 feet of such habitat, and before any ground-disturbing activity within 250 feet of the habitat.

► Habitat Preservation: The applicant, in consultation with USFWS, shall compensate for direct effects of the project on potential habitat for vernal pool fairy shrimp, conservancy fairy shrimp, and vernal pool tadpole shrimp at a ratio of 2:1, by purchasing vernal pool preservation credits from a USFWS-approved conservation bank. Compensation credits shall be purchased prior to any ground-disturbing activities.

- Habitat Creation: The applicant shall compensate for the direct effects of the project on potential habitat for vernal pool fairy shrimp, conservancy fairy shrimp, and vernal pool tadpole shrimp at a ratio of 1:1, by purchasing vernal pool creation credits from a USFWS-approved conservation bank.
- For seasonal wetlands and drainages that shall be retained on the site (i.e., those not proposed to be filled), a minimum setback of at least 50 feet from these features will be avoided on the project site. The buffer area shall be fenced with high visibility construction fencing prior to commencement of ground-disturbing activities and shall be maintained for the duration of construction activities.
- A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.
- ► The applicant shall secure any necessary take authorization prior to project construction through consultation with USFWS pursuant to Section 7 of the ESA.
- Documentation of habitat preservation, habitat creation, and take authorization shall be provided to the County following approval by USFWS.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2c would reduce significant impacts on vernal pool fairy shrimp, and vernal pool tadpole shrimp and suitable habitat to a **less-than-significant** level because it would offset the impact through preserving vernal pool habitat at a ratio of 2:1 and the creation of vernal pool habitat at a ratio of 1:1 within a USFWS-approved mitigation bank or onsite habitat enhancement and protection subject to USFWS approval.

Mitigation Measure 4.4-2d: Protection of Conservancy Fairy Shrimp Habitat From Indirect Effects

The project applicant shall implement the following measures to minimize indirect effects to Conservancy fairy shrimp habitat prior to any ground-disturbing activities within or adjacent to the playa pool on the project site.

- ► During the dry season, when the playa pool is completely devoid of water, the project applicant shall construct a permanent, impermeable barrier along the southern boundary of the new disposal area within the Triangle that overlaps the playa pool. The barrier will be designed to prevent stormwater runoff or sediment discharge between the project site and the playa pool and will remain in place after construction to prevent operation-related discharge into the playa pool. The barrier shall be constructed of material that prevents discharge into the playa pool, including but not limited to: an earthen levee, steel sheet piles, or concrete riprap. Final design plans shall be reviewed and approved by a qualified biologist and the County.
- The project site will be graded in a manner that prevents surface water flow from the project site into the playa pool.
- A worker environmental awareness training shall be conducted to inform onsite construction personnel regarding the potential presence of listed species and the importance of avoiding impacts to these species and their habitat.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2d would reduce significant impacts on conservancy fairy shrimp habitat to a **less-than-significant** level because it would prevent indirect effects to suitable habitat for this species within the playa pool by preventing sediment discharge from the project site.

Burrowing Owl

Burrowing owl is a California species of special concern. Potentially suitable breeding habitat is present within the grassland on the project site. Suitable burrows and ground squirrel activity were not observed during the 2017 reconnaissance-level survey; however, there are known occurrences of burrowing owl within less than 2 miles of the project site. It is feasible that nearby burrowing owls could prospect and breed within the project site. Project activities, such as ground disturbance, grading, and vegetation removal could result in disturbance to burrowing owls, as well as direct loss of owls (i.e., adults, chicks, eggs) and burrows if present. This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-2e: Protection of Burrowing Owl

Prior to ground disturbance, grading, or vegetation removal activities for the lateral expansion (Triangle), the project applicant will implement the following measures:

- ► The applicant shall retain a qualified biologist to conduct focused breeding and nonbreeding season surveys for burrowing owls in areas of suitable habitat on and within 1,500 feet of the project site. Surveys shall be conducted prior to the start of construction activities and in accordance with Appendix D of CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFW 2012).
- If no occupied burrows are found, a letter report documenting the survey methods and results shall be submitted to CDFW and no further mitigation will be required.
- If an active burrow is found during the nonbreeding season (September 1 through January 31), the applicant shall consult with CDFW regarding protection buffers to be established around the occupied burrow and maintained throughout construction. If occupied burrows are present that cannot be avoided or adequately protected with a no-disturbance buffer, a burrowing owl exclusion plan shall be developed, as described in Appendix E of CDFW's 2012 Staff Report. Burrowing owls shall not be excluded from occupied burrows until the project's burrowing owl exclusion plan shall include a plan for creation, maintenance, and monitoring of artificial burrows in suitable habitat proximate to the burrows to be destroyed, that provide substitute burrows for displaced owls.
- ► If an active burrow is found during the breeding season (February 1 through August 31), occupied burrows shall not be disturbed and will be provided with a 150- to 1,500-foot protective buffer unless a qualified biologist verifies through noninvasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. The size of the buffer shall depend on the time of year and level disturbance as outlined in the CDFW Staff Report (CDFW 2012). The size of the buffer may be reduced if a broad-scale, long-term, monitoring program acceptable to CDFW is implemented to ensure burrowing owls are not detrimentally affected. Once the fledglings are capable of independent survival, the owls can be evicted and the burrow can be destroyed per the terms of a CDFW-approved burrowing owl exclusion plan developed in accordance with Appendix E of CDFW's 2012 Staff Report.
- ► If active burrowing owl nests are found on the site and are destroyed by project implementation, the project applicant shall mitigate the loss of occupied habitat in accordance with guidance provided in the CDFW 2012 Staff Report, which states that permanent impacts to nesting, occupied and satellite burrows, and burrowing owl habitat shall be mitigated such that habitat acreage, number of burrows, and burrowing owls impacted are replaced through permanent conservation of comparable or better habitat with similar vegetation communities and burrowing mammals (e.g., ground squirrels) present to provide for nesting, foraging, wintering, and dispersal. The applicant shall retain a qualified biologist to develop a burrowing owl mitigation and management plan that incorporates the following goals and standards:
 - Mitigation lands shall be selected based on comparison of the habitat lost to the compensatory habitat, including type and structure of habitat, disturbance levels, potential for conflicts with humans, pets, and other wildlife, density of burrowing owls, and relative importance of the habitat to the species range wide.
 - If feasible, mitigation lands shall be provided adjacent or proximate to the site so that displaced owls can relocate with reduced risk of take. Feasibility of providing mitigation adjacent or proximate to the project site depends on availability of sufficient suitable habitat to support displaced owls that may be preserved in perpetuity.
 - If suitable habitat is not available for conservation adjacent or proximate to the project site, mitigation lands shall be focused on consolidating and enlarging conservation areas outside of urban and planned growth areas and within foraging distance of other conservation lands. Mitigation may be accomplished through purchase of mitigation credits at a CDFW-approved mitigation bank, if available. If mitigation credits are not

available from an approved bank and mitigation lands are not available adjacent to other conservation lands, alternative mitigation sites and acreage shall be determined in consultation with CDFW.

If mitigation is not available through an approved mitigation bank and will be completed through permittee-responsible conservation lands, the mitigation plan shall include mitigation objectives, site selection factors, site management roles and responsibilities, vegetation management goals, financial assurances and funding mechanisms, performance standards and success criteria, monitoring and reporting protocols, and adaptive management measures. Success shall be based on the number of adult burrowing owls and pairs using the site and if the numbers are maintained over time. Measures of success, as suggested in the 2012 Staff Report, shall include site tenacity, number of adult owls present and reproducing, colonization by burrowing owls from elsewhere, changes in distribution, and trends in stressors.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2e would reduce potential impacts on burrowing owl to a **less-than-significant** level because burrowing owls would be avoided and protected from construction activities, or the project applicant would compensate for project-related loss of suitable occupied habitat.

Swainson's Hawk, White-Tailed Kite, Tricolored Blackbird, Northern Harrier, California Black Rail

California black rail and Swainson's hawk are listed as threatened under CESA and California black rail is also a fully protected species under California Fish and Game Code. White-tailed kite is also fully protected under Fish and Game Code. Tricolored blackbird is a candidate for listing under CESA and is currently a California species of special concern. Northern harrier is a California species of special concern. Potentially suitable nesting habitat for tricolored blackbird and California black rail is present within the Bird Sanctuary area adjacent to the Triangle, and within vegetation along drainage ditches on and adjacent to the project site. Northern harrier could nest within the grassland habitat within the project site, and Swainson's hawk and white-tailed kite could nest within trees within and adjacent to the project site. Additionally, project plans include the conversion of approximately 17 acres of potentially suitable grassland Swainson's hawk foraging habitat within the Triangle.

Project activities, such as ground disturbance, vegetation removal, and presence of construction equipment, vehicles, and personnel could result in disturbance to special-status bird species or direct loss of adults, chicks, or eggs, if present within the project site. This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-2f: Special-status and Other Nesting Bird Surveys and Avoidance

Prior to any ground disturbances for the lateral expansion (Triangle), the applicant will implement the following measures to reduce impacts on special-status bird species:

- To minimize the potential for disturbance or loss of tricolored blackbird, northern harrier, California black rail, or other bird nests, vegetation removal activities will only occur during the nonbreeding season (September 1-January 31). If all suitable nesting habitat (e.g., trees, grassland) is removed during the nonbreeding season, no further mitigation would be required.
- Prior to removal of any vegetation or any ground disturbance between February 1 and August 31, a qualified biologist will conduct preconstruction surveys for nests within 0.5 mile of the project site for Swainson's hawks, 500 feet for other nesting raptors, and 100 feet for all other birds. The surveys will be conducted no more than 30 days before construction commences.
- ► If no active nests are found during focused surveys, no further action under this measure will be required.
- ► If active nests are located during the preconstruction surveys, the biologist will notify CDFW. Impacts to nesting Swainson's hawks, other raptors, or other nesting birds shall be avoided by establishing appropriate buffers around active nest sites identified during preconstruction raptor surveys. Project activity shall not commence within the

buffer areas until a qualified biologist has determined, in coordination with CDFW, that the young have fledged, the nest is no longer active, or reducing the buffer would not likely result in nest abandonment. CDFW guidelines recommend implementation of 0.5-mile-wide buffer for Swainson's hawk, 500 feet for other raptors, and 100 feet for other nesting birds, but the size of the buffer may be adjusted if a qualified biologist and the project applicant, in consultation with CDFW, determine that such an adjustment would not be likely to adversely affect the nest. Monitoring of the nest by a qualified biologist during and after construction activities shall be required if the activity has potential to adversely affect the nest.

Mitigation Measure 4.4-2g: Swainson's Hawk Foraging Habitat Mitigation

To mitigate for the loss of approximately 17 acres of suitable Swainson's hawk foraging habitat, the project applicant shall implement a Swainson's hawk mitigation plan consistent with the following but not limited to the requirements described below:

- Prior to site disturbance associated with the landfill expansion, such as clearing or grubbing within the Triangle, building, or other site improvements, or recordation of a final map, whichever occurs first, the project applicant shall acquire suitable Swainson's hawk foraging habitat as determined by CDFW.
- ► The project applicant shall preserve through conservation easement(s) or fee title one acre of similar habitat for each acre affected or shall purchase credits from a CDFW-approved mitigation bank in Solano County at the same ratio.
- ► The project applicant may transfer said easement(s) or title to CDFW and a third-party conservation organization as acceptable to CDFW. Such third-party conservation organizations shall be characterized by non-profit 5019(c)(3) status with the Internal Revenue Service.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2f would minimize impacts on nesting special-status birds, raptors, and other migratory birds by requiring pre-construction surveys and protection of active nests within and adjacent to the project site. Implementation of Mitigation Measure 4.4-2g would reduce impacts to Swainson's hawk foraging habitat by requiring compensation for habitat loss. With implementation of these mitigation measures and for the aforementioned reasons, impacts would be **less than significant**.

Impact 4.4-3: Potential impacts to Wetlands, Vernal Pools, and Other Waters of the United States and State

Potentially jurisdictional vernal pools, vernal pool swales, open water, detention basins, and drainage ditches are present within the project site. Future land use changes and development would result in conversion of these wetlands and vernal pools to urban uses. Loss or degradation of wetland or vernal pool habitat would be a **potentially significant** impact.

The project site contains wetland habitat within vernal pools, vernal pool swales, a detention basin, open water within the Bird Sanctuary and borrow pit area, and drainage ditches. An aquatic resources delineation of the project site concluded that approximately 5.7 acres of potentially jurisdictional wetland habitat, located primarily within the Triangle, would be adversely affected by project construction activities, including 4.8 acres of vernal pool habitat, 0.8 acres of drainage ditch habitat, and a 0.04-acre detention basin (Figure 4.4-1, ICF 2017). This would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-3: Wetland Delineation Verification, Permitting, and Compensatory Mitigation

Prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches) the project applicant will implement the following measures:

- Wetlands and vernal pools are of special concern to resource agencies and are afforded specific consideration, based on Section 404 of the CWA and other applicable regulations. An updated delineation of waters of the United States or state, including wetlands that would be affected by the project, was completed by ICF in 2017 (ICF 2017). This delineation shall be submitted to and verified by USACE. If, based on the verified delineation, it is determined that fill of waters of the United States or state would result from implementation of the project, authorization for such fill shall be secured from USACE through the 404 permitting process.
- Any waters of the United States that would be affected by project development shall be replaced or restored on a "no-net-loss" basis in accordance with USACE mitigation guidelines (or the applicable USACE guidelines in place at the time of construction). In association with the Section 404 permit (if applicable) and prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches), Section 401 Water Quality Certification from the RWQCB shall be obtained.
- ► If it is determined that waters subject to jurisdiction by CDFW are present within the project site following the delineation of waters of the United States and state, and that site development would affect the bed, bank, or channel, a Streambed Alteration Notification will be submitted to CDFW, pursuant to Section 1600 et seq. of the California Fish and Game Code. If proposed activities are determined to be subject to CDFW jurisdiction, the project proponent will abide by the conditions of any executed agreement prior to ground disturbance, grading, or vegetation removal activities within undeveloped areas of the project site (including ditches). Several aquatic features onsite, including intermittent streams, would likely fall under the jurisdiction of CDFW.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-3 would reduce impacts to wetlands, other waters of the United States, and waters of the state to a **less-than-significant** level because it would result in no net loss of functions and acreage of wetlands, vernal pools, and other waters through implementation of USACE mitigation guidelines.

Impact 4.4-4: Impacts to Wildlife Migratory Corridors

Future land use changes and development within the project site would result in loss of grassland and vernal pool habitats but would not substantially impede wildlife movement because the project site is relatively small, mostly developed, and is surrounded by roads and agricultural development. The project site does not contain any native wildlife nursery sites. Impacts to movement corridors and habitat connectivity for these species would be **less than significant**.

While the project site is mostly developed, the Triangle contains vernal pool grassland habitat that is contiguous with the same habitat in the Eastern Mitigation Area and the Burke Ranch conservation bank to the southwest (Figure 4.4-1). The Triangle and portions of the Western and Eastern Mitigation Areas are located within natural landscape blocks, but the project site does not contain any portion of an Essential Connectivity Area (Figure 4.4-2). The project site itself is mostly developed and is bordered by Hay Road to the north and SR 113 to the east. The project site is otherwise surrounded by extensive agricultural development; especially to the north, east, and west. The project site contain any nursery sites. Because of the relatively small size of the project site and its proximity to existing agricultural and urban development and roads, the project site is not expected to provide significant connectivity for wildlife movement between important habitats or core areas within the region or contain any portion of a major or local wildlife corridor. Therefore, impacts to wildlife corridors or nursery sites would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.4-5: Conflict with the Solano County General Plan

Project implementation could result in impacts to natural resources and conversion of vernal pool habitat within an area identified as a high-priority habitat area in the Solano County General Plan, potentially resulting in a conflict with the Plan. This would be a **potentially significant** impact.

The Solano County General Plan contains resource goals to preserve wildlife habitat and natural resources, including special-status species, wetlands, sensitive natural communities, oak woodlands, and heritage oak trees (Solano County 2008). The project site is located within the Solano County General Plan "resource conservation overlay" (Solano County 2008: Figure RS-1 and RS-2) which includes an area identified as a containing high-priority habitat. Project implementation could result in adverse effects to special-status plants, special-status wildlife, and vernal pool grassland habitat. However, all significant impacts would be reduced to a less-than-significant level with implementation of previously discussed mitigation measures (i.e., Mitigation Measures 4.4-1a, 4.4-1b, 4.4-1c, 4.4-2a, 4.4-2b, 4.4-2c, 4.4-2d, 4.4-2e, 4.4-2f, 4.4-2g, and 4.4-3 of this SEIR). Additionally, the project site does not contain any native oak trees, and no trees on the site are planned for removal.

Mitigation Measures

Implement Mitigation Measures 4.4-1a, 4.4-1b, 4.4-1c, 4.4-2a, 4.4-2b, 4.4-2c, 4.4-2d, 4.4-2e, 4.4-2f, 4.4-2g, and 4.4-3 as described in this section.

Significance after Mitigation

Implementation of the above previously-described mitigation measures would result in consistency with the Solano County General Plan. Impacts would be **less than significant**.

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4.5 ENERGY

This section was prepared pursuant to State CEQA Guidelines Section 15126 and Appendix F of the State CEQA Guidelines, which require that EIRs include a discussion of the potential energy impacts of projects. The analysis considers whether the project would result in inefficient, wasteful, and unnecessary consumption of energy.

Energy related to the project would include energy directly consumed for space heating and cooling, and electric facilities and lighting at residential units. Indirect energy consumption would be associated with the generation of electricity at power plants. Transportation-related energy consumption includes the use of fuels and electricity to power cars, trucks, and public transportation. Energy would also be consumed by equipment and vehicles used during project construction and routine maintenance activities.

4.5.1 Regulatory Setting

Energy conservation is embodied in many federal, state, and local statutes and policies. At the federal level, energy standards apply to numerous products (e.g., the U.S. Environmental Protection Agency's [EPA] EnergyStar™ program) and transportation (e.g., fuel efficiency standards). At the state level, Title 24 of the California Code of Regulations sets forth energy standards for buildings. Further, the State provides rebates/tax credits for installation of renewable energy systems, and offers the Flex Your Power program promotes conservation in multiple areas. At the local level, individual cities and counties establish policies in their general plans and climate action plans (CAPs) related to the energy efficiency of new development and land use planning and to the use of renewable energy sources.

FEDERAL

Energy Policy and Conservation Act, and CAFE Standards

The Energy Policy and Conservation Act of 1975 established nationwide fuel economy standards to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration (NHTSA), part of the U.S. Department of Transportation (DOT), is responsible for revising existing fuel economy standards and establishing new vehicle economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with the CAFE standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the country. EPA calculates a CAFE value for each manufacturer based on the city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, DOT is authorized to assess penalties for noncompliance. Under the Energy Independence and Security Act of 2007 (described below), the CAFE standards were revised for the first time in 30 years.

Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally-fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAct. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by EPAct to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 is designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. It represents a major step forward in expanding the production of renewable fuels, reducing dependence on oil, and confronting global climate change. The Energy Independence and Security Act of 2007 increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and reduces U.S. demand for oil by setting a national fuel economy standard of 35 miles per gallon by 2020— an increase in fuel economy standards of 40 percent.

By addressing renewable fuels and the CAFE standards, the Energy Independence and Security Act of 2007 builds on progress made by the Energy Policy Act of 2005 in setting out a comprehensive national energy strategy for the 21st century.

STATE

State of California Energy Plan

CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The current plan is the 1997 California Energy Plan. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban design that reduces vehicle miles traveled (VMT) and accommodates pedestrian and bicycle access.

Integrated Energy Policy Report

Senate Bill (SB) 1389 (Chapter 568, Statutes of 2002) required CEC to: "conduct assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery and distribution, demand, and prices. The Energy Commission shall use these assessments and forecasts to develop energy policies that conserve resources, protect the environment, ensure energy reliability, enhance the state's economy, and protect public health and safety" (Public Resources Code Section 25301(a)). This work culminated in the Integrated Energy Policy Report (IEPR).

CEC adopts an IEPR every two years and an update every other year. The 2017 IEPR is the most recent IEPR, which was adopted March 16, 2018. The 2017 IEPR provides a summary of priority energy issues currently facing the State, outlining strategies and recommendations to further the State's goal of ensuring reliable, affordable, and environmentally-responsible energy sources. Energy topics covered in the report include progress toward statewide renewable energy targets and issues facing future renewable development; efforts to increase energy efficiency in existing and new buildings; progress by utilities in achieving energy efficiency targets and potential; improving coordination among the State's energy agencies; streamlining power plant licensing processes; results of preliminary forecasts of electricity, natural gas, and transportation fuel supply and demand; future energy infrastructure needs; the need for research and development efforts to statewide energy policies; and issues facing California's nuclear power plants.

Senate Bill 1078: California Renewables Portfolio Standard Program

SB 1078 (Chapter 516, Statutes of 2002) establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year. The outcome of this legislation will impact regional transportation powered by electricity. As of 2017, the State has reported that 32 percent of retail electricity sales were served by renewable energy facilities (CEC 2018a).

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California. SB X1-2 mandates that renewables from these sources make up at least 50 percent of the total renewable energy for the 2011-2013 compliance period, at least 65 percent for the 2014-2016 compliance period, and at least 75 percent for 2016 and beyond.

Senate Bill 100: California Renewables Portfolio Standard Program

SB 100 requires that all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, supply 44 percent of retail sales from renewable resources by December 31, 2024, 50 percent by December 31, 2026, 52 percent by December 31, 2027, and 60 percent by December 31, 2030. The law requires that eligible renewable energy resources and zero-carbon resources supply 100 percent of retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045.

Senate Bill 350: Clean Energy and Pollution Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California's energy markets. The State's three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California's electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California's future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 *Energy Action Plan II*, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues and research and development activities. CEC recently adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State's ongoing actions in the context of global climate change.

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statues of 2005) required CEC to prepare a state plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels Plan (SAF Plan) in partnership with the California Air Resources Board (CARB) and in consultation with other State, federal, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce greenhouse gas (GHG) emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Assembly Bill 32, Senate Bill 32, and Climate Change Scoping Plan and Update

Reducing GHG emissions in California has been the focus of the state government for approximately two decades (State of California 2018). GHG emission targets established by the state legislature include reducing statewide GHG emissions to 1990 levels by 2020 (AB 32 of 2006) and reducing them to 40 percent below 1990 levels by 2030 (SB 32 of 2016). Executive Order S-3-05 calls for statewide GHG emissions to be reduced to 80 percent below 1990 levels by 2050. These targets are in line with the scientifically established levels needed in the United States to limit the rise in

global temperature to no more than 2 degrees Celsius, the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected (United Nations 2015).

California's 2017 Climate Change Scoping Plan (2017 Scoping Plan), prepared by CARB, outlines the main strategies California will implement to achieve the legislated GHG emission target for 2030 and "substantially advance toward our 2050 climate goals" (CARB 2017:1, 3, 5, 20, 25–26). It identifies the reductions needed by each GHG emission sector (e.g., transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential, and recycling and waste). In 2015, electricity generation accounted for 11 percent of the State's GHG emissions. California plans to significantly reduce GHG emissions from the energy through the development of renewable electricity generation in the form of solar, wind, geothermal, hydraulic, and biomass generation. The State is on target meet the SB X1-2-33 percent renewable energy target by 2020 and will continue to increase statewide renewable energy to 50 percent by 2030, as directed by SB 350. Additionally, the State will further its climate goals through improving the energy efficiency of residential and non-residential buildings by continual updates (i.e., every three years) to the Energy Code, which contains mandatory and prescriptive energy efficiency standards for all new construction.

LOCAL

Solano County General Plan

The Solano County General Plan includes various policies and implementation programs related to the conservation and efficient use of energy (Solano County 2008). Policies and implementation programs relevant to the project include:

- ► **RS.P-49:** Ensure energy conservation and reduced energy demand in the county through required use of energy-efficient technologies.
- ► **RS.P-53:** Enable renewable energy sources to be produced from resources available in Solano County, such as solar, water, wind, and biofuels to reduce the reliance on energy resources from outside the county.
- ► RS.P-54: Reduce Solano County's reliance on fossil fuels for transportation and other energy-consuming activities.
- ► RS.P-59: Encourage on-site renewable energy production and use and energy conservation measures.
- ► **RS.I-49**: Require all off-road diesel powered vehicles used for construction to be newer model, low-emission vehicles, or use retrofit emission control devices, such as diesel oxidization catalyst and diesel particulate filters verified by the California Air Resources Board.
- HS.I-56: Comply with the California Air Resources Board and Bay Area or Yolo-Solano Air Quality Management District rules, regulations, and recommendations for Solano County facilities and operations. Such operations shall comply with mandated measures to reduce emissions from fuel consumption, energy consumption, surface coating operations, and solvent usage.

Solano County Climate Action Plan

Solano County adopted its Climate Action Plan (CAP) in June 2011 (Solano County 2011). The CAP sets forth measures for reducing countywide GHG emissions to 20 percent below 2005 levels by 2020. The CAP includes a series of measures related to reducing energy use and increasing the supply of renewable energy. CAP measures relevant to the project include:

- ► E-5: Work with CalRecycle, Bay Area waste agencies, other jurisdictions, and interested private sector parties to develop an agricultural and food waste-to-energy biomass facility in Solano County.
- ► E-6: Partner with Solano Economic Development Corporation, Pacific Gas & Electric, and agricultural processing and industry energy businesses to increase building and process energy efficiency.
- ► W-4: Facilitate CalRecycle and the State Air Resources Board's implementation of the Landfill Methane Capture Strategy by requiring landfills to capture methane to the greatest extent possible.

4.5.2 Environmental Setting

ELECTRICITY SERVICE

Electric service to the landfill is provided via infrastructure built and maintained by Pacific Gas & Electric (PG&E). In addition, and for renewable energy purposes, a portion of the landfill gas (LFG) produced at the RHR Landfill is routed to an internal combustion engine located in a building (adjacent to the landfill) that converts the methane in the LFG to electric power. The internal combustion engine is rated to an output of 1.6 megawatts of renewable energy and generates approximately 12,900 megawatt hours per year. The generated electricity is then sold via a power purchase agreement to PG&E (Golder 2018).

NATURAL GAS SERVICE

PG&E supplies natural gas service throughout Solano County. However, the RHR Landfill does not have an active connection to or use natural gas currently at the RHR Landfill.

ALTERNATIVE FUELS

A variety of alternative fuels are used to reduce demand for petroleum-based fuel. The use of these fuels is encouraged through various statewide regulations and plans (e.g., Low Carbon Fuel Standard, AB 32 Scoping Plan). Conventional gasoline and diesel may be replaced (depending on the capability of the vehicle) with many transportation fuels, including:

- biodiesel,
- electricity,
- ethanol (E-10 and E-85),
- hydrogen,
- natural gas (methane in the form of compressed and liquefied natural gas),
- propane,
- ► renewable diesel (including biomass-to-liquid),
- synthetic fuels, and
- gas-to-liquid and coal-to-liquid fuels.

California has a growing number of alternative fuel vehicles through the joint efforts of CEC, CARB, local air districts, federal government, transit agencies, utilities, and other public and private entities. As of November 2019, California contained more than 26,500 alternative fueling stations (U.S. Department of Energy 2019).

ENERGY USE FOR TRANSPORTATION

Transportation is the second largest energy consumer nationwide, accounting for 27 percent of the total national energy use. On-road vehicles are estimated to consume approximately 80 percent of California's transportation energy demand, with cars, trucks, and buses accounting for nearly all of the on-road fuel consumption. Petroleum products (e.g., gasoline, diesel, jet fuel) account for almost 99 percent of the energy used in California by the transportation sector, with the rest provided by ethanol, natural gas, and electricity (Bureau of Transportation Statistics [BTS] 2017).

On-road vehicles use about 90 percent of the petroleum consumed in California. The California Department of Transportation (Caltrans) projected 19,427 million gallons of gasoline and diesel were consumed in Santa Clara County in 2015, an increase of approximately 2,342 million gallons of fuel from 2010 levels (Caltrans 2008).

Vehicle Miles Traveled and Gasoline Consumption

Though California's population and economy are expected to grow, gasoline demand is projected to decline from roughly 15.8 billion gallons in 2017 to less than 12.7 billion gallons in 2030. This decline comes in response to both increasing vehicle electrification and higher fuel economy for new vehicles (CEC 2017). Between 2008 and 2013, the total vehicle miles traveled (VMT) in California increased; however, during the same period of time VMT per capita decreased (BTS 2017). As noted in Section 3.2, "Air Quality," the project would result in a VMT increase over the existing operations. This increase is attributable to the projected increase in volume of solid waste accepted at the landfill and the increased distance traveled by haulers serving the project.

Total gasoline consumption in California varies from year to year because of a variety of factors such as gas prices, periods of economic growth and decline, and fuel economy of vehicles. Between January 2007 and May 2016, an average of approximately 672 billion gallons of gasoline were purchased in California. During this time, the volume of gasoline purchased ranged from a minimum of approximately 1.1 billion gallons in February 2013 to a maximum of approximately 1.37 billion gallons in August 2007 (California State Board of Equalization 2016).

Energy Used by Private and Commercial Vehicles

Commercial vehicles, generally composed of light-, medium-, and heavy-duty trucks, are typically fueled by diesel or gasoline and are part of the general fleet mix of vehicles present within the Solano County region transportation system.

Average fuel economy is expected to increase for automobiles and all types of trucks. The federal CAFE is the required average fuel economy for a vehicle manufacturer's entire fleet of passenger cars and light-duty trucks for each model year. Beyond improving average fuel economy for vehicle fleets, these standards are also intended to reduce petroleum consumption, increase the availability of alternative fuel vehicles, promote the advancement of innovative technologies, and reduce vehicle related greenhouse gas emissions. CAFE standards are regulated by DOT's NHTSA with the assistance of EPA (DOT 2018).

4.5.3 Environmental Impacts and Mitigation Measures

ANALYSIS METHODOLOGY

Levels of construction- and operation-related energy consumption by the project, are measured in megawatt-hours (MWh) of electricity, million Btu (MMBtu) of natural gas, and gallons of gasoline and diesel fuel. Energy consumption estimates were calculated using the California Emissions Estimator Model (CalEEMod) version 2016.3.2 computer program (California Air Pollution Control Officers Association 2017). Construction fuel consumption was calculated in CalEEMod using a heavy-duty construction equipment list provided by the project applicant and based on CalEEMod default anticipated hourly daily usage, days used, and worker commute trip VMT. Table 4.5-1 summarizes the levels of energy consumption for each phase of construction.

Phase	Diesel (Gallons)	Gasoline (Gallons)
Grading	164,138	1,868
Geomembrane Installation	10,596	0
Total	174,735	1,868

Table 4.5-1	Construction	Energy	Consumption

Notes: Gasoline gallons include on-road gallons from worker trips. Diesel gallons include off-road equipment and on-road gallons from worker and vendor trips.

Source: Calculations by Ascent Environmental in 2019. See Appendix H for more calculations and assumptions.

Operational diesel and gasoline consumption was calculated using CARB's 2014 Emissions Factor model (CARB 2014), estimated daily project-generated traffic and average trip lengths (SCS Engineers 2019). Where project-specific information was not known, CalEEMod default values based on the project's location were used. Table 4.5-2 summarizes the levels of energy consumption for the existing operations and the estimated project operations. A detailed discussion of the assumptions for daily trips and trip lengths is provided in Appendix G of this SEIR and a detailed breakdown of the gasoline and diesel consumption is provided in Appendix H of this SEIR.

Operational Phase	Gasoline (gal/year)	Diesel (gal/year)
Existing Operations	6,976	1,786,274
With Project	19,043	2,273,690
Net Change in Fuel Consumption	+12,067	+487,416

Table 4.5-2 Net Change in Gasoline and Diesel Consumption

Notes: gal/year = gallons per year.

Source: Calculations by Ascent Environmental in 2019. See Appendix H for more calculations and assumptions.

THRESHOLDS OF SIGNIFICANCE

The following significance criteria are based on CEQA Guidelines Appendix G, which state that implementation of the project would have a potentially significant adverse impact if it would:

- result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation; or
- conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

IMPACT ANALYSIS

Impact 4.5-1: Result in Inefficient and Wasteful Consumption of Energy

The project would not increase electricity and natural gas consumption at the project site relative to existing conditions; no new structures requiring energy supplies would be required. However, construction and operation of the project would result in additional fuel consumption, associated with the use of construction equipment and vehicles travelling to and from the landfill. However, as part of the project and on an ongoing basis, Recology would use modern, more fuel-efficient equipment, and as part of the project, the increase in transfer trucks under the project reflects a consolidation and overall reduction in the number of potential vehicles travelling to and from the landfill. For these reasons, the project would not result in wasteful, inefficient, or unnecessary consumption of energy. This impact would be **less than significant**.

The CEQA Guidelines requires the consideration of the energy implications of a project. CEQA requires mitigation measures to reduce "wasteful, inefficient, and unnecessary" energy use (Public Resources Code Section 21100, subdivision (b)(3)). Neither the law nor the State CEQA Guidelines establish criteria that define wasteful, inefficient, or unnecessary use. Compliance with the California Energy Code would result in energy-efficient buildings. However, compliance with the California Energy Code does not address all energy impacts that could potentially be associated with construction and operation of landfill activities. For example, energy would be required to transport solid waste to the project site. Energy use is discussed by project component below.

Construction Energy Consumption

Energy would be required to construct the proposed landfill expansion, operate and maintain construction equipment, and transport construction materials. The one-time energy expenditure required to expand the landfill would be nonrecoverable. Most energy consumption would result from the use of construction equipment and vehicle trips associated with commutes by construction workers and haul trucks supplying materials. The energy

needs for the project construction would be temporary and would not require additional capacity or increase peak or base period demands for electricity or other forms of energy. Furthermore, construction equipment use and associated energy consumption would be typical of that associated with general construction activities and would not necessitate the use of construction equipment in a manner that would be less energy efficient than those used at comparable construction sites in other parts of the State. Idling of onsite equipment during construction would be limited to no more than five minutes in accordance with YSAQMD requirements. Further, onsite construction equipment may include alternative-fueled vehicles where feasible. Finally, construction activities would employ best available engineering techniques, construction and design practices, and equipment operating procedures, thereby ensuring that the wasteful consumption of fuels and use of energy would not occur.

Operational Energy Consumption

Under the project, no new structures or onsite uses requiring additional electricity or natural gas supplies would be required onsite. However, operational activities as a result of the project could result in the consumption of additional fuel by haul trucks transporting solid waste to the site. More specifically, the increase in allowable tonnage at the landfill as part of the project could result in more deliveries of solid waste to the project site and higher fuel consumption, on a daily basis. However, the majority of new vehicles that are anticipated to travel to the project site would be transfer trucks, which reflect a consolidation of solid waste haul vehicles, and an associated reduction in fuel consumption (2 or more vehicles compared to one transfer truck). Furthermore, the RHR Landfill site represents one of the closest landfills that receives Bay Area solid waste supplies to the Bay Area. Continued and increased disposal of solid waste from the Bay Area at the RHR Landfill would reduce the need to utilize facilities located farther away, thereby reducing potential fuel consumption. As a result, the projected increase in solid waste haul vehicles traveling to and from the RHR Landfill as part of the project would not be considered inefficient, wasteful, or unnecessary. In addition, as noted in Section 4.7, "Greenhouse Gas Emissions and Climate Change," Recology regularly updates and modernizes its existing equipment and fleet, thereby providing more fuel- and energy-efficient equipment on an ongoing basis.

Therefore, the project's energy consumption through construction, building operation, and transportation would not be considered wasteful, inefficient, or unnecessary. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.5-2: Consistency with Plans for Renewable Energy and Energy Efficiency

The project would be required to comply with federal and State energy standards regulations for reducing fuel consumption through construction and landfilling activities. Thus, this impact is **less than significant**.

As noted above, implementation of the project would not require the consumption of natural gas and/or additional electricity supplies. Furthermore, RHR Landfill and Recology would comply with current and future federal and State energy efficiency programs and regulations, including the Low Carbon Fuel Standard, CAFE Standards, and Low Emission Vehicle Program, would reduce the transportation fuel demand associated with the project. Adherence to the increasingly stringent vehicle efficiency standards, as well as Recology's consistent modernization of its existing fleet, would reduce energy demands associated with the project, consistent with applicable plans, policies, and regulations adopted for the purposes of avoiding or mitigating environmental effects related to energy. Further, the project would not remove or reduce the energy generated onsite via the existing LFG-to-energy facility that utilizes methane supplies from decomposing waste, which is consistent with the State's energy efficiency and renewable energy goals. Therefore, impacts would be **less than significant**.

Mitigation Measures

No mitigation is required.

4.6 GEOLOGY, SOILS, MINERAL, AND PALEONTOLOGICAL RESOURCES

This section describes the federal and state regulations and local policies related to geologic hazards and seismic conditions; existing geologic and soil conditions in the region and at the project site; potential geologic hazards and soils impacts associated with project construction and implementation; mineral resources; and paleontological resources. Due to changes to the State CEQA Guidelines in December 2018, the threshold related to paleontological resources, which was often addressed (including within the August 2018 NOP for the project) as part of the cultural resources issue area of Appendix G, was moved to the CEQA issue area for geology and soils. As a result of the recent changes to the CEQA Guidelines, the analysis of potential impacts to paleontological resources is addressed as part of this section of the Draft Subsequent Environmental Impact Report (SEIR). Potential environmental effects related to water quality resulting from soil erosion and other stormwater issues are addressed in Section 4.9, "Hydrology and Water Quality."

No comments pertaining to geology, soils, mineral, or paleontological resources were received during public review of the Notice of Preparation for the proposed project.

4.6.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

National Earthquake Hazards Reduction Act

The National Earthquake Hazards Reduction Act was passed to reduce the risks to life and property resulting from earthquakes. To accomplish this, the act established the National Earthquake Hazards Reduction Program (NEHRP). The mission of NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. NEHRP designates the Federal Emergency Management Agency as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities. Other NEHRP agencies include the National Institute of Standards and Technology, National Science Foundation, and the U.S. Geological Survey.

STATE PLANS, POLICIES, AND REGULATIONS

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) (Public Resources Code Sections 2621–2630) was passed in 1972 to mitigate the hazard of surface faulting to structures designed for human occupancy. The primary purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace, the intersection of a fault with the ground surface, of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as "Earthquake Fault Zones" around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code Sections 2690–2699.6), addresses earthquake hazards other than surface rupture, including liquefaction and seismically induced landslides. The act established a

mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. The Act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

Guidelines for Evaluation and Mitigation of Seismic Hazards in California

Originally adopted March 13, 1997 by the State Mining and Geology Board in accordance with the Seismic Hazards Mapping Act of 1990, and revised in 2008, Special Publication 117A constitutes the guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures.

California Building Standards Code

The State of California provides minimum standards for building design through the California Building Standards Code (CBC) (Title 24 of the California Code of Regulations [CCR]). Where no other building codes apply, Chapter 29 regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with more detailed and/or more stringent regulations.

The state earthquake protection law (California Health and Safety Code Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Chapter 33 regulates grading activities, including drainage and erosion control and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

Title 27 of California Code of Regulations

Title 27 of the CCR, Division 2, Solid Waste provides criteria for all waste management units, facilities, and disposal sites. Article 4 of Chapter 3 addresses waste management unit construction standards and states that Class III landfills shall have containment structures which are capable of preventing degradation of waters of the state as a result of waste discharges to the landfills if site characteristics are inadequate. Liners shall be designed and constructed to contain the fluid, including landfill gas, waste, and leachate, as required by Article 3 of Subchapter 2 (Section 20240 et seq., and Section 20310). Leachate collection and removal systems (LCRS) are required for Class II landfills and surface impoundments, and for Class III landfills which have a liner or which accept sewage or water treatment sludge. The LCRS shall be installed directly above underlying containment features for landfills and waste piles, and installed between the liners for surface impoundments. Article 4 of Chapter 4 of Title 27 also states that a stability analysis, including a determination of expected peak acceleration, must be conducted) for Class III landfills (Section 21750(f)(5)).

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

The County is responsible for implementation of state- and federally-mandated laws and regulations related to geology and soils before permitting projects. In addition, portions of the County General Plan and County Code relate to geology, soils, and other geologic hazards.

Solano County General Plan-Chapter 5, Public Health and Safety

The following policies of the County General Plan are considered applicable to the project, with respect to geology and soils.

• **Policy HS.P-12**: Require new development proposals in moderate or high seismic hazard areas to consider risks caused by seismic activity and to include project features that minimize these risks.

- Policy HS.P-14: Identify and minimize potential hazards to life and property caused by fault displacement and its impact on facilities that attract large numbers of people, are open to the general public, or provide essential community services and that are located within identified earthquake fault zones.
- Policy HS.P-15: Reduce risk of failure and reduce potential effects of failure during seismic events through standards for the construction and placement of utilities, pipelines, or other public facilities located on or crossing active fault zones.
- ► Policy HS.P-18: Make information about soils with a high shrink-swell potential readily available. Require proper foundation designs in these areas.

4.6.2 Environmental Setting

The primary sources of information for this section are the *Joint Technical Document, Recology Hay Road* report prepared by Golder Associates Inc. (Golder 2018), The Solano County General Plan (Solano County 2008a), and the *Solano County General Plan EIR* (Solano County 2008b).

GEOLOGY AND TOPOGRAPHY

Western Solano County consists of hilly to very steep mountainous uplands of the Coast Ranges that grade down to the low elevation, flatter areas of the Sacramento Valley in the eastern part of the county. These flatter areas are comprised of low alluvial plains and fans, as well as flooded basins. Low hills and dissected uplands lie north of Vacaville to Putah Creek with the Suisun Bay Tidal Flats and the San Pablo Bay to the south.

The project site is located in the southern portion of the Putah Plain, a relatively flat, broad area that stretches from the Coast Range, northwest of the City of Vacaville, to the Sacramento River Delta to the southeast. The Putah Plain is comprised of relatively flat Holocene alluvial fan deposits that consist of fine-grained silts and clays characteristic of floodplain deposits, inter-bedded with sand and gravel lenses attributed to stream channel deposition. Over time, the Putah Plain has been developed for farming and ranching. Drainages have been modified and controlled, minimizing flooding and new sediment deposition. The upper soils have been tilled and disturbed, breaking the clay-rich hardpan in some areas.

Topography within the permitted landfill boundary has been substantially altered and is dominated by the landfill mounds within the central and eastern portion of the permitted landfill. The Recology Hay Road (RHR) Property has little natural relief other than small drainage swales and small mounds and slight depressions. The ground surface was originally between 18 to 30 feet above mean sea level (Golder 2018).

Geologic maps published by U.S. Geological Survey within Williamson et al. (1989) show the geology of site and surrounding area as containing continental rocks and deposits (Pliocene to Holocene) that include younger alluvium, older alluvium and pre-Quaternary to Quaternary (<2.6 million years old) surficial deposits (Golder 2015: 2). A hydrogeological investigation of the site prepared by Einarson Geoscience, Inc. (1995; cited in Golder 2015: 2) identified three primary geologic units beneath the RHR Property (in order from youngest to oldest):

- Younger alluvium: Holocene; from ground surface to between 5 and 10 feet below ground surface (bgs) and located primarily within the northeastern portion of the Landfill and underlain by older alluvium;
- Older Alluvium: Pleistocene to Holocene; from 5 to 10 feet bgs to between 60 and 130 feet bgs (dominant geologic unit at the project site); and
- ► Tehama Formation: Pliocene to Pleistocene; below 60 to 130 feet bgs within the site.

These geologic units are relatively flat-lying alluvial sediments. They are often similar in lithology, and the subsurface contacts between the units are not well defined and may be gradational (Einarson 1995; cited in Golder 2018: 3-4). In general, the upper alluvial units are unconsolidated, but increase in density with depth. The Tehama Formation is similar in composition to the older alluvium at the site such that Einarson (1995; cited in Golder 2015) could not differentiate them in boring logs. The Tehama Formation, however, is typically more cemented by calcium carbonate

than the overlying older alluvium and is characteristically more consolidated (Einarson 1995; cited in Golder 2015: 2-3), A detailed description of these units is provided below.

Younger Alluvium (Holocene, Recent-10,000 years old)

The younger alluvium is generally comprised of pale brown to gray-brown sandy silts typically ranging from 0 to 20 feet thick and unconformably overlies the older alluvium. These deposits have been primarily mapped as fine-grained Holocene-age alluvium and occur at the ground surface over the northeastern portion of the site near Alamo Creek (Golder 2018: 3-4, 3-5).

Older Alluvium (Pleistocene: 10,000-1.8 million years old)

The older alluvium occurs at the ground surface over much of the Putah Plain. These sediments are typically orange-brown, loose to moderately compacted sandy silts and clays, with lenses and tongues of sand and gravel. The thickness of the older alluvium throughout the Putah Plain ranges from 60 to 130 feet. The older alluvium is distinguished from the younger alluvium by the presence of a mature soil profile containing a dense, clay-rich B-horizon (Golder 2018: 3-5).

Tehama Formation

The Tehama formation has no surface exposure at the RHR Property. The presence of the formation at depth is based on regional geologic relationships and the sediments encountered in the deepest site borings. The Tehama formation consists of alluvial sediments lithologically similar to older alluvial, with some calcium carbonate cementation and greater compaction. The Tehama Formation generally consists of moderately compacted silt, clay and silty fine sand with lenses of sand and gravel. The formation exhibits some degree of calcium carbonate cementation and greater compaction than the overlying older alluvium. The formation varies significantly in thickness, ranging from a thickness of 2,500 feet east of the site to 98 feet west of the site. However, the considerable thinning of the formation is likely due to tectonic faulting by the Vaca fault, which has been mapped approximately 6 miles west of the site (Golder 2018: 3-5).

SOILS

Soil conditions for the portion of Solano County where the project site is located are provided in Thomasson et al. (1960; cited in Golder 2015: 10), which indicates that, in general, the western two-thirds of the RHR Property is underlain by older alluvial deposits consisting of loose to moderately compacted silt, silty clay, sand and gravel. The eastern one-third of the RHR Property was constructed in an area containing young alluvial deposits (up to 20 feet thick) composed mostly of loose silt and fine sand with clay and gravel (Golder 2015: 10).

Erosion Potential and Hazard Rating

Erosion is the process by which surface soils are detached and transported by water and/or wind. Erosion has a detrimental effect on soil productivity because erosion begins with the upper horizons of a soil profile, which contain organic matter and microbial communities vital to supporting plant growth. Factors that influence the erosion potential of a soil include: vegetative cover; soil properties such as soil texture, structure, rock fragments and depth; steepness and slope length; and climatic factors such as the amount and intensity of precipitation.

The Natural Resources Conservation Service (NRCS) rates erosion hazards of disturbed soil into one of the following four categories:

- ► Slight erosion is unlikely under ordinary climatic conditions;
- Moderate some erosion is likely and erosion control measures may be needed;
- Severe erosion is very likely and erosion control measures such as revegetation of bare areas may be needed; or
- Very Severe significant erosion is expected, loss of soil productivity and offsite damage are likely and erosion control measures may be costly and generally impractical. (Solano County 2008b:4.7-34)

Per the 2008 Solano County General Plan, the project site is located in an area with slight erosion potential (Solano County 2008b: 4.7-20,-25,-34).

Expansive Soils

Expansive soils contain shrink-swell clays that are capable of absorbing water. As water is absorbed the clays increase in volume. This change in volume is capable of exerting enough force on buildings and other structures to damage foundations and walls. Damage can also occur as these soils dry out and contract. The Solano County General Plan indicates that the RHR Property is located within an area of high shrink-swell potential area (Solano County 2015: Figure HS-10, HS-39).

SEISMICITY AND FAULT ZONES

An earthquake is classified by the amount of energy released, which traditionally has been quantified using the Richter scale. Recently, seismologists have begun using a moment magnitude (M) scale because it provides a more accurate measurement of the size of large earthquakes. For earthquakes of less than M 7.0, the moment and Richter magnitude scales are nearly identical. For earthquakes greater than M 7.0, readings on the moment magnitude scale are slightly higher than the corresponding Richter magnitude.

The intensity of seismic shaking, or strong ground motion, during an earthquake is dependent on the distance and direction from the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions of the surrounding area. Ground shaking could potentially result in the damage or collapse of buildings and other structures. Most earthquakes occur along faults, which are fractures or geological areas of weakness, along which rocks on one side have been displaced with respect to those on the other side. Most faults are the result of repeated displacement that may have taken place suddenly and/or by slow creep.

A seismic hazard assessment for the RHR Property was prepared by Golder Associates in March 2015 (Golder 2015). According to the report, there are 22 active faults located within 100 kilometers (62 miles) of the project site. Major earthquake events within 62 miles of the site that produced a M 4 or greater, are shown in Table 4.6-1. The closest recorded earthquake to the site greater than M 4.0 was the M 6.4 earthquake that occurred on April 19, 1892 (Golder 2015: 4-6).

Date	Latitude ([°] N)	Longitude ([°] W)	Distance From RHR Site (miles)	Reported Moment Magnitude (M)
April 18, 1906	37.750	122.550	55	7.7
October 21, 1868	37.700	122.100	45	6.8
April 19, 1892	38.414	121.961	10	6.4
January 24, 1980	37.743	121.825	39	5.8
October 2, 1969	38.296	122.755	50	5.7
March 31, 1986	37.512	121.649	56	5.6
October 31, 2007	37.426	121.810	61	5.6
Sept. 3, 2000	38.379	122.413	32	5.0
May 8, 2005	38.378	122.166	30	4.1

Table 4.6-1	Recorded Earthquakes	Within 100 km	(62 mi) of the RHR	Landfill, Solano	County, California
			(

Source: Golder 2015:4-5

Figure 4.6-1 shows major fault zones and historic earthquake epicenters within about 62 miles (100 km) of the project site. The northern segment of Midland Fault is located about 4.3 miles northeast of the E Property and is considered the most significant fault that can control the maximum peak ground acceleration (PGA) value at the RHR Property (Golder 2015: 8). The results of Golder's assessment indicate that a PGA value of 0.58 g can be expected at the site from a maximum credible earthquake (MCE) generated by movement along the northern segment of the Midland Fault (Golder 2015: 15).

Liquefaction and Ground Failure

Soil liquefaction occurs when ground shaking from an earthquake causes a sediment layer saturated with groundwater to lose strength and take on the characteristics of a fluid. Factors determining the liquefaction potential are soil type, the level and duration of seismic ground motions, the type and consistency of soils, and the depth to groundwater. Loose sands and peat deposits are susceptible to liquefaction, while clayey silts, and silty clays are generally stable under the influence of seismic ground shaking (California Geological Survey 2008:35-37). Liquefaction poses a hazard to engineered structures. The loss of soil strength can result in bearing capacity insufficient to support foundation loads, increased lateral pressure on retaining or basement walls, and slope instability. Sites underlain by relatively loose sandy soils and saturated deposits of fill combined with a shallow groundwater table, which typically are located in alluvial river valleys/basins and floodplains, are susceptible to liquefaction.

The site is not located within a liquefaction hazard zone, as mapped by the California Geological Survey (CGS) (CGS 2019). The Solano County General Plan (Chapter 5, Public Health and Safety), identifies the majority of the RHR Property as containing low liquefaction potential and an area along the western boundary of the RHR Property as having high liquefaction potential (Solano County 2015: HS-37).

Loose saturated sandy soils are typically associated with liquefaction hazards (Golder 2018: 3-10). As described in the Recology Hay Road Permit Revision Initial Study (Douglas Environmental 2012: 2-28, 2-29), the soils underlying the landfill site consist of silty clay and clayey sand that typically are not susceptible to liquefaction.

SUBSIDENCE AND EXPANSION

Land surface subsidence can be induced by both natural and human phenomena. Natural phenomena include: tectonic deformations and seismically induced settlements; consolidation, hydrocompaction, or rapid sedimentation; oxidation or dewatering of organic rich soils; subsurface cavities. Subsidence related to human activity includes subsurface fluid or sediment withdrawal. Pumping of water for residential, commercial, and agricultural uses from subsurface water tables causes more than 80 percent of the identified subsidence in the United States (Galloway et al. 1999:1). Lateral spreading is the horizontal movement or spreading of soil toward an open face, such as a stream bank, the open side of fill embankments, or the sides of levees. The potential for failure from subsidence and lateral spreading is highest in areas where there is a high groundwater table, where there are relatively soft and recent alluvial deposits, and where creek banks are relatively high.

The native materials underlying the RHR Property consist of silty clay and clayey sand that typically are not susceptible to landsliding, lateral spreading, subsidence, liquefaction, or collapse (Douglas Environmental 2012: 2-29).

SLOPE STABILITY

A landslide is the downhill movement of masses of earth material under the force of gravity. The factors contributing to landslide potential are steep slopes, unstable terrain, and proximity to earthquake faults. This process typically involves the surface soil and an upper portion of the underlying bedrock. Expansive soil on slopes tends to shrink and swell in response to moisture content changes. During this shrinking and swelling process, gravity tends to work the soil downslope. Movement may be very rapid, or so slow that a change of position can be noted only over a period of weeks or years (creep). The size of a landslide can range from several square feet to several square miles.

Although the project site is located in an area where natural topography is generally flat, slope stability of engineered landfill slopes must be evaluated for compliance with Title 27 of the CCR. Article 4 of Chapter 4 of Title 27 also states that a stability analysis, including a determination of expected peak acceleration, must be conducted) for Class III landfills (Section 21750(f)(5)).



MINERAL RESOURCES

Mineral resources mined or produced within Solano County include mercury, sand and gravel, clay, stone products, calcium, and sulfur. Known mineral resource zones in Solano County consist of an area located northeast of Vallejo, south and southeast of Green Valley, areas south and east of Travis Air Force Base, and pockets located within both Vacaville and Fairfield (Solano County 2008b). Solano County falls within Mineral Resources Zones described in California Surface Mining and Reclamation Act (SMARA) Mineral Land Classification Reports SR 146 Parts I and III, and SR 156 (DOC 2013). Based on a review of these maps, there are no known mineral resources zones associated with the project site (Stinson, Manson, and Plappert 1983 Plate 3.2, Dupras 1988).

PALEONTOLOGICAL RESOURCES

Known Paleontological Resources within Solano County

To identify known fossil locations in the county, an online fossil locality search was conducted on June 20, 2018, using the Berkeley Natural History Museums' online database; specifically, data from the University of California Museum of Paleontology, Berkeley (UCMP 2018). Relevant paleontological and geological literature for Solano County and its vicinity was reviewed for a characterization of the county's geology and paleontological sensitivity. The locality search identified 297 known fossil sites within the county. Of this total, 69 sites consist of vertebrate specimens and 169 contain invertebrate specimens. The localities occur in 12 distinguishable geologic formations, all of which are known to contain fossils. Within the county, most sedimentary geological units and some of the igneous geological units of Solano County are paleontologically sensitive (Solano County 2008b:4.10-22).

Solano County's diverse geological setting spans 144 million years, from the early Jurassic Period through today. Geologically, the western portion of the county is made up of the north-south trending Sacramento and San Joaquin Valleys, as well as a small portion of the Northern California Coast Ranges. The Northern California Coast Range in Solano County, known as the Vaca Mountains, consists of Cretaceous and Tertiary strata that has been uplifted and tilted eastward. A large predominantly Quaternary plain lies to the east of the Vaca Mountains. In the southwestern portion of the county, Pliocene and late Miocene volcanic deposits are commonly found. The Pleistocene Montezuma Hills lie just north of the confluence of the Sacramento and San Joaquin Rivers, where they drain to Suisun Bay. Suisun and Montezuma Sloughs mark a large tidal wetland that enters Grizzly Bay along the southern border of the county.

Onsite Potential

A review of the geologic map for Solano County indicates that the project site is comprised of younger (Holocene) alluvium, older (Pleistocene) alluvium, and Tehama Formation. These geologic units are described as follows.

Younger Alluvium (Holocene: Recent-10,000 years old)

These Late Holocene alluvial deposits overlie older Pleistocene alluvium and/or the upper Tertiary bedrock formations in the. This alluvium consists of sand, silt, and gravel deposited in fan, valley fill, terrace, or basin environments. This unit is typically in smooth, flat valley bottoms, in medium-sized drainages and other areas where terrain allows a thin veneer of this alluvium to deposit, generally in shallowly sloping or flat environments (Graymer et al. 2002; cited in Solano County 2008b: 4.7-1). These alluvial deposits contain vertebrate and invertebrate fossils of extant, modern taxa (Helley et al. 1979; cited in Solano County 2008b: 4.7-1), which are generally not considered paleontologically significant (Solano County 2008b: 4.10-19).

Older Alluvium (Pleistocene: 10,000-1.8 million years old)

The majority of alluvium in the central and eastern portion of the county consists of sedimentary deposits that are Plio-Pleistocene in age. These less permeable sediments are basin, landslide intertidal, terrace, or riverbank deposit. Vertebrate fossils found in Late Pleistocene alluvium are representative of the Rancholabrean land mammal age from which many taxa are now extinct (Bell et al. 2004; cited in Solano County 2008b: 4.7-1) and include but are not limited to bison, mammoth, ground sloths, saber-toothed cats, dire wolves, cave bears, rodents, birds, reptiles and amphibians (Bell et al. 2004, Helley et al. 1979, Hertlein 1951, Savage 1951, Stirton 1951; cited in Solano County 2008b: 4.7-1). These alluvial deposits are highly sensitive for paleontological resources (Solano County 2008b: 4.10-19).

The Tehama Formation (Pliocene: 1.8-5.3 million years old)

The Tehama Formation occurs at the ground surface in the low hills lying west of the site and underlies most of the remainder of the Putah Plain (Golder 2018:3-5). The Tehama Formation generally consists of moderately compacted silt, clay and silty fine sand with lenses of sand and gravel. The formation exhibits some degree of calcium carbonate cementation and greater compaction than the overlying older alluvium. The formation varies significantly in thickness, ranging from a thickness of 2,500 feet east of the site to 98 feet west of the site. However, the considerable thinning of the formation is likely due to tectonic faulting by the Vaca fault, which has been mapped approximately 6 miles west of the site (Einarson Geoscience 1995; cited in Golder 2018:3-5). This series of fluvial deposits is 2,000 feet thick on average and contains fragmentary vertebrate bones (Russell 1927; cited in Solano County 2008b:4.10-19). Although only one vertebrate fossil locality is recorded from this formation within the county, the Tehama Formation contains significant fossils (Graymer, Jones, and Brabb 2002; cited in Solano County 2008b:4.10-19) and has high paleontological sensitivity (Solano County 2008b:4.10-19).

4.6.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Based on Appendix G of the State CEQA Guidelines, the project could have a significant adverse effect related to geology and soils resources if it would:

- directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
 - strong seismic ground shaking;
 - seismic-related ground failure, including liquefaction; or
 - landslides;
- be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or offsite landslide, lateral spreading, subsidence, liquefaction or collapse;
- ► be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
- have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- result in the loss of availability of a known mineral resource that would be of value to the Region and the residents of the state; or
- result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan; and
- > Directly or indirectly destroy a unique paleontological site or unique geological feature.

METHODOLOGY

Information describing regional and site-specific geologic and soil conditions was reviewed and the potential risks associated with development of the proposed project were assessed in the context of potential risks and constraints. This analysis relies on review of the JTD prepared for the project site as well as published geologic maps and literature.

It is assumed that structural design and construction techniques must comply with applicable CBC requirements and that recommendations contained in site specific geotechnical investigations will be implemented.

ISSUES NOT DISCUSSED FURTHER

Mineral Resources

A review of the Solano County General Plan (2008a: RS-33) and applicable SMARA mineral land classification reports (Stinson, Manson, and Plappert 1983 Plate 3.2, Dupras 1988) indicate that there are no known mineral resources zones associated with the RHR Property. Thus, the project would not affect the availability of a known mineral resources and there would be no impacts. This issue is not discussed further in this SEIR.

Septic Tank

The potential for onsite soils to be incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems was identified as a potentially significant impact requiring mitigation in the RHR Landfill Draft SEIR (EDAW 2005: 4-57). The 2005 SEIR also identified the potential for significant groundwater and surface water contamination if the onsite sewage disposal system was not properly installed. Mitigation Measure GEO-1 required the facility operator to implement all necessary design measures to prevent impacts to surface or groundwater to reduce the impact to less than significant (EDAW 2005: 4-57). A new septic system is not proposed as part of this project. Existing wastewater supplies are collected via an onsite septic system and because no expansion of administrative or other use that would require septic service would occur under the project, no expansion of septic is proposed. Therefore, the issue is not discussed further in this SEIR.

Liquefaction

The site does not lie in a State of California Liquefaction Hazard Zone, as mapped by the California Geological Survey (CGS). The Solano County General Plan (Chapter 5, Public Health and Safety) identifies the majority of the RHR Property as containing low liquefaction potential and an area along the western boundary of the RHR Property as having high liquefaction potential (Solano County 2015: HS-37). However, loose saturated sandy soils are typically associated with liquefaction hazards and the native materials underlying the RHR Property consist of silty clay and clayey sand (Douglas Environmental 2012: 2-29). Thus, no impacts related to liquefaction are anticipated. This issue is not discussed further in this SEIR.

Subsidence

As noted above, subsidence occurs when large amounts of groundwater have been withdrawn from certain types of soils, such as fine-grained sediments, and the soil loses support and collapses upon itself. The native materials underlying the RHR Property consist of silty clay and clayey sand that typically are not susceptible to landsliding, lateral spreading, subsidence, or collapse (Douglas Environmental 2012: 2-29). Because unstable soil conditions were not identified at the project site, this issue is not discussed further in this SEIR.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.6-1: Exposure of People or Structures to Potential Increases in Seismic Hazards

Project facilities would be constructed on a site that may be subject to strong seismic ground shaking from active earthquake faults and the site is located within an area of high shrink-swell potential area. Seismic ground shaking, though infrequent, could cause structural failure of proposed facilities. Because the project would be designed, engineered, and constructed in conformance with applicable codes and standard engineering practices, which consider the characteristics of materials and forces, and are designed to result in adequate strength and safety requirements, the potential for structural damage and associated hazards to people during a seismic event would be substantially reduced, and this impact would be **less than significant**.

Solano County is an area of relatively high seismicity and will be subject to earthquake shaking in the future. Earthquake triggered landslides are a potential major problem that can be induced by moderate ground shaking. In addition, ground failure in the form of liquefaction, lurching, and settlement could also result from shaking. The RHR facility and the project site is not located within an Alquist-Priolo Special Studies Zone. The RHR facility is located approximately 4 miles from the Midland Fault north segment, but there is insufficient data to confirm that the north segment is an active seismogenic source. However, this absence of data is predominately due to the lack of detailed studies on the north segment. In addition, The active Concord-Green Valley Fault is located approximately 20 miles from the project site. A characteristic earthquake (maximum moment magnitude of 6.9) on this fault would cause strong to moderate ground shaking. Because of the potential for major earthquake activity in the region, ground shaking would be a potential hazard associated with the proposed project. Ground shaking intensity would depend on the magnitude of the earthquake, the distance from the epicenter, and the duration of shaking.

The shrinking and swelling of expansive soils as a result of moisture changes can damage building foundations, underground utilities, and other subsurface facilities if these facilities are not designed and constructed to resist the changing soil conditions. As discussed above, The Solano County General Plan indicates that the RHR Property is located within an area of high shrink-swell potential (Solano County 2015: Figure HS-10, HS-39).

The RHR Property is located in an area with natural slopes of 4 percent or less (Solano County 2015: HS-33).The proposed project would involve a lateral expansion of the landfill disposal area by approximately 24-acres and deepening and widening of the borrow pit. State regulations require that landfills comply with specific slope stability criteria that include both seismic and static conditions. CCR Title 27, Section 21090 specifies maximum final slopes and minimum design requirements. A slope or foundation stability report is required for final slopes that exceed a horizontal to vertical ratio of 3:1 or for slopes in areas subject to liquefaction or unstable areas with poor foundation conditions. The slopes of the landfill would be consistent with state requirements and would be required to remain stable under both static and seismic loading conditions. All proposed improvements would be designed, engineered, and constructed in conformance with applicable codes and standard engineering practices to minimize potential damage from seismic hazards and expansive soils.

Upon completion of disposal activities associated with the proposed project, a final cover would be installed over the waste disposal area that would meet or exceed appropriate regulatory standards and would be planted with native and non-native grasses to reduce runoff velocities and prevent erosion. In addition, the final cover would be designed to accommodate anticipated settlement and subsidence and to withstand the effects of seismic events throughout the minimum 30-year post-closure maintenance period and beyond. Final cover would be placed in accordance with a closure schedule to be included in a final closure and post-closure maintenance plan, which would be subject to approval by the Central Valley Regional Water Quality Control Board (RWQCB), California's Department of Resources Recycling and Recovery (CalRecycle), and the Local Enforcement Agency.

The proposed project includes deepening and widening of the existing borrow pit. Excavation and reclamation activities at the borrow pit would occur concurrently. This includes cultivation, gradation, and revegetation of bare sides, as necessary to minimize erosion potential and provide interim slope stabilization. These activities would comply with Chapter 33 of the CBC, which regulates grading activities, including drainage and erosion control and construction on unstable soils, such as expansive soils and areas subject to liquefaction. Grading and erosion control would also be consistent with applicable regulations related to grading and erosion control in Chapter 31 of the Solano County Code. Reclamation activities and compliance with required regulations would minimize the potential for landsliding and other potentially adverse seismic related impacts.

The Triangle area would be developed consistent with CCR Title 27 requirements. The borrow pit would be expanded consistent with applicable regulations and would continue to be managed to minimize the potential for landsliding and other potentially adverse seismic-related impacts. Thus, because the proposed project would be designed, engineered, and constructed in conformance with standard engineering practices to minimize potential structural damage during a seismic event, this impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

Impact 4.6-2: Destruction of a Unique Paleontological Resource

Portions of the Recology Hay Road (RHR) Property are underlain by older(Pleistocene) alluvium and the Tehama Formation, two geologic units known to be highly sensitive for paleontological resources. Thus, the project could have a **potentially significant** impact on paleontological resources.

According to the UC Berkeley Museum of Paleontology database, there are 297 localities in which fossil remains have been found in Solano County (UCMP 2018). The geological formations identified do not include formations at the site, younger (Holocene) alluvium, older (Pleistocene) alluvium, or the Tehama Formation. However, portions of the project site underlain by older (Pleistocene) alluvium and the Tehama Formation are considered highly sensitive for paleontological resources. Therefore, ground-disturbing construction activities could uncover previously unknown paleontological resources. This impact would be potentially significant.

Mitigation Measures

Mitigation Measure 4.6-1: Paleontological Resources

Prior to initiation of earthmoving activities associated with the Triangle or deepening and widening of the borrow pit, Recology shall retain a qualified paleontologist to alert all construction personnel involved with earthmoving activities, including the site superintendent, about the possibility of encountering fossils. The appearance and types of fossils likely to be seen during construction will be described. Construction personnel will be trained about the proper notification procedures should fossils be encountered.

If paleontological resources are discovered during earthmoving activities, the construction crew will be directed to immediately cease work in the vicinity of the find and notify the County. Recology will retain a qualified paleontologist that will be readily available for quick identification and salvage of fossils so that construction delays can be minimized. If large specimens are discovered, the paleontologist will have the authority to halt or divert grading and construction equipment while the finds are removed. The paleontologist will be responsible for implementing the following measures.

- ► In the event of discovery, salvage of unearthed fossil remains, typically involving simple excavation of the exposed specimen but possibly also plaster-jacketing of large and/or fragile specimens, or more elaborate quarry excavations of richly fossiliferous deposits
- Recovery of stratigraphic and geologic data to provide a context for the recovered fossil remains, typically including description of lithologies of fossil-bearing strata, measurement and description of the overall stratigraphic section, and photographic documentation of the geologic setting
- Laboratory preparation (cleaning and repair) of collected fossil remains to a point of curation, generally involving removal of enclosing rock material, stabilization of fragile specimens (using glues and other hardeners), and repair of broken specimens
- Cataloging and identification of prepared fossil remains, typically involving scientific identification of specimens, inventory of specimens, assignment of catalog numbers, and entry of data into an inventory database
- Transferal, for storage, of cataloged fossil remains to an appropriate repository
- Preparation of a final report summarizing the field and laboratory methods used, the stratigraphic units inspected, the types of fossils recovered, and the significance of the curated collection.

Significance after Mitigation

Implementation of Mitigation Measure 4.6-1 would reduce significant impacts on previously-unknown paleontological resources to a **less-than-significant** level because construction workers would be alerted to the possibility of encountering paleontological resources and, if resources were encountered, fossil specimens would be appropriately recorded and treated, including potential curation.

4.7 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This chapter presents a summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; quantification of project-generated GHG emissions and discussion about their potential contribution to global climate change; and analysis of the project's resiliency to climate change-related risks.

No comments pertaining to GHG emissions were received during public review of the Notice of Preparation (NOP).

4.7.1 Regulatory Setting

FEDERAL

In *Massachusetts et al. v. Environmental Protection Agency et al.*, 549 U.S. 497 (2007), the U.S. Supreme Court ruled that carbon dioxide (CO₂) is an air pollutant as defined under the federal Clean Air Act and that the U.S. Environmental Protection Agency (EPA) has the authority to regulate GHG emissions.

In 2010, EPA started to address GHG emissions from stationary sources through its New Source Review permitting program, including operating permits for "major sources" issued under Title V of the federal Clean Air Act.

In October 2012, EPA and the National Highway Traffic Safety Administration, on behalf of the U.S. Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 *Federal Register* [FR] 62624). These rules would increase fuel economy to the equivalent of 54.5 miles per gallon, limiting vehicle emissions to 163 grams of CO₂ per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630). However, on April 2, 2018, the EPA administrator announced a final determination that the current standards are not appropriate and should be revised. The Safer Affordable Fuel Efficient (SAFE) Vehicles Proposed Rule for Model Years 2021–2026 has been proposed and would freeze the CAFE standards from 2021 to 2026. It is not yet known if the SAFE Rule will be adopted or when they will be implemented (EPA 2018a).

In 2015, EPA unveiled the Clean Power Plan. The purpose of the plan was to reduce CO₂ emissions from electrical power generation by 32 percent relative to 2005 levels within 25 years. EPA is proposing to repeal the Clean Power Plan because of a change to the legal interpretation of Section 111(d) of the federal Clean Air Act, on which the Clean Power Plan was based. The comment period on the proposed repeal closed April 26, 2018.

On March 12, 1996, EPA promulgated a regulation requiring emissions controls for large municipal solid waste (MSW) landfills (61 FR 9905). The regulation is titled "Standards of Performance for Stationary Sources and Guidelines for Control of Existing Sources: MSW Landfills." It includes both New Source Performance Standards (NSPS) that regulate emissions from new landfills and Emission Guidelines that regulate emissions from existing landfills. On August 29, 2016, EPA finalized a new subpart under Section 111(b) of the Clean Air Act to apply NSPS to landfills that commenced construction, or modification after July 17, 2014. The California Air Resources Board (CARB) is required to submit a State Plan for Compliance to EPA.

In March 2000, in response to environmental justice concerns for siting waste transfer and landfill locations EPA published *A Regulatory Standard for Siting and Operating Waste Transfer Stations* (EPA 2000). These regulations include guidance for landfill siting through setting location restrictions to ensure that landfills are built in suitable geological and topographic locations to reduce impacts on residents and other sensitive receptors, and the environment.

Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills

EPA published these guidelines to reduce both methane and non-methane organic compound (NMOC) emissions from existing municipal solid waste (MSW) landfills (81 Fed. Reg. 59275 [Aug. 29, 2019]). The guidelines apply to

"existing" MSW landfills that commenced construction, modification, or reconstruction before July 17, 2014, and that have accepted waste at any time since November 8, 1987 or have additional capacity for future waste acceptance. The guidelines require the installation of a landfill gas collection and control system at larger MSW landfills that exceed a specified design capacity and NMOC emission threshold. The guidelines require that each state submit a plan to EPA that identifies how the state intends to meet the federal requirements contained in the guidelines. Further information regarding California's State Plan to implement the Guidelines is presented below. It was developed by the California Air Resources Board (CARB) with the assistance of the air quality management and air pollution control districts and others working together as an ad hoc Landfill 111(d) Workgroup.

Greenhouse Gas Emissions and Fuel Efficiency

In September 2011, EPA, in coordination with the National Highway Traffic Safety Administration (NHTSA), adopted fuel consumption and CO₂ emission standards to reduce GHG emissions of heavy-duty vehicles. These Phase 1 federal standards apply to model year 2014 and newer heavy-duty trucks, tractors, pick-up trucks, vans, and vocational vehicles. The category of specialized vocational vehicles includes delivery trucks, emergency vehicles, and refuse trucks such as the "packer" garbage collection trucks used to transport solid waste to transfer stations and landfills. The Phase 1 regulations do not include standards regarding the trailers pulled by these vehicles for improving aerodynamics and fuel efficiency.

In 2016, working together with NHTSA and CARB, EPA implemented the next phase of federal greenhouse gas (GHG) emissions and fuel-efficiency standards for medium- and heavy-duty vehicles and associated trailers. These federal Phase 2 standards build on the improvements in engine and vehicle efficiency required by the Phase 1 emission standards and aim to achieve further GHG reductions for 2018 and later model year heavy-duty vehicles. The progressively more stringent federal Phase 2 standards are more technology-driven than the Phase 1 standards, in that they require manufacturers to improve existing technologies or develop new technologies for heavy-duty trucks, tractors, and vocational vehicles to achieve the stricter standards. The Phase 2 federal standards were jointly adopted by the U.S. EPA and NHTSA on October 25, 2016. California subsequently enacted its own Phase 2 standards for GHG emissions, which are discussed in further detail below.

STATE

Statewide GHG Emission Targets and the Climate Change Scoping Plan

Reducing GHG emissions in California has been the focus of the State for approximately two decades (State of California 2018). GHG emission targets established by the legislature include reducing statewide GHG emissions to 1990 levels by 2020 (AB 32 of 2006) and reducing them to 40 percent below 1990 levels by 2030 (Senate Bill [SB] 32 of 2016). Executive Order S-3-05 calls for statewide GHG emissions to be reduced to 80 percent below 1990 levels by 2050. Executive Order B-55-18 directs California to achieve carbon neutrality by 2045 and achieve and maintain net negative GHG emissions thereafter. These targets are in line with the scientifically established levels needed in the U.S. to limit the rise in global temperature to no more than two degrees Celsius, the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected; these targets also pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius (United Nations 2015:3).

California's 2017 Climate Change Scoping Plan (2017 Scoping Plan), prepared by CARB, outlines the main strategies California will implement to achieve the legislated GHG emission target for 2030 and "substantially advance toward our 2050 climate goals" (CARB 2017a:1, 3, 5, 20, 25–26). It identifies the reductions needed by each GHG emission sector (e.g., transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential [GWP], and recycling and waste). CARB and other state agencies also released the *2030 Draft Natural and Working Lands Climate Change Implementation Plan* consistent with the carbon neutrality goal of Executive Order B-55-18. The Plan furthers the state's goals through improving the carbon sequestration potential of the state's natural and working lands through improved soil health and forest management strategies.

The State has also passed more detailed legislation addressing GHG emissions associated with industrial sources, transportation, electricity generation, energy consumption, and solid waste generation and diversion, as summarized below.

Short-Lived Climate Pollutant Reduction Strategy

In March 2017, CARB adopted the SLCP Strategy pursuant to Senate Bill (SB) 605 (Lara, Chapter 523, Statutes of 2014) and SB 1383. SLCPs have high GWP values, which is the measure of how much heat a GHG traps in the atmosphere during a specific time horizon relative to CO₂. The *SLCP Strategy* is recognized in CARB's 2017 Scoping Plan as an important measure for achieving statewide GHG emission targets (CARB 2017a:3). The *SLCP Strategy* identifies methane, fluorinated gases, and black carbon as SLCPs of concern, and provides a suite of strategies to reduce emissions of these pollutants. The *SCLP Strategy* includes targets to achieve a 50 percent reduction strategy in the level of statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction in the level of statewide disposal of organic waste from the 2014 level by 2025 (CARB 2017b). The law requires CalRecycle, in consultation with CARB, to adopt regulations for achieving these targets. Additional goals include converting manure and organic wastes to energy and soil amendment products, reducing the disposal of edible food by increasing food recovery, reducing emissions from residential wood stoves, and phasing out the use of fluorinated gases (CARB 2017a). CalRecycle began conducting the rulemaking and regulation process in 2017 and plans to adopt rules in 2019. These rules would not take effect until 2022, but would require jurisdictions, haulers, and generators to consider taking actions to implement programs to comply with these rules on January 1, 2022 (CalRecycle 2018a).

Landfill Methane Control Measures

The capture and control of methane from landfills was part of discrete early action measure in CARB's first Scoping Plan (CARB 2017a:89). CARB approved the Landfill Methane Control Measure in June 2010, with updates as recent as April 2017. This regulation reduces emissions of methane from municipal solid waste landfills in response to Assembly Bill (AB) 32. The regulation requires owners and operators of municipal solid waste landfills to install gas collection and control systems and requires existing and newly installed gas and control systems to operate in an optimal manner. The regulation is overseen by CARB, with enforcement authority granted to local air districts through a memorandum of understanding (MOU).

In May 2017, CARB adopted the California State Plan for Municipal Solid Waste Landfills to implement the federal reporting and emissions compliance requirements of EPA's Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills (summarized above). The plan includes emission standards and compliance target dates, procedures used for determining compliance with the emissions standards, legally enforceable increments of progress towards compliance, source and emission inventories of designated facilities, and provisions for annual emission reporting and progress reports, and a description of public participation in implementation. Throughout the plan, CARB developed MOUs between CARB and air districts across the state regarding implementation and enforcement of regulation to reduce methane emissions from municipal solid waste landfills (CARB 2017c:8).

Solid Waste Diversion Regulations

In 2011, the legislature established a 75 percent statewide solid waste recycling rate goal by 2020 with its passage of AB 341 (Chesboro, Chapter 476, Statutes of 2011). AB 341 directed CalRecycle to develop a strategy to achieve this 75 percent recycling goal. In response, CalRecycle developed the *75 Percent Strategy* which includes five strategies and three additional focus areas for its pursuit to achieve the recycling goal. Strategies include moving organics out of the landfill; expanding the recycling/manufacturing infrastructure; exploring new models for state and local funding of materials management program; promoting state procurement of postconsumer recycle content products; and promoting extended producer responsibility (CalRecycle 2018a). CalRecycle has provided updates to this strategy along with supporting documentation as recently as 2017, which tracks progress towards this goal and summarizes co-benefits from implementation of the *75 Percent Strategy*.

In October 2014, the governor signed AB 1826 (Chesbro Chapter 727, Statues of 2014), requiring local jurisdictions to implement an organic waste recycling program to divert organic waste generated by businesses. The law phases in the mandatory recycling of commercial organics over time. In 2020, CalRecycle is mandated to conduct a formal

review of all jurisdictions to determine the total statewide disposal of organic waste. If CalRecycle finds that the statewide disposal of organic waste has not been reduced by 50 percent of the disposal level in 2014, the requirements of this law will expand, and certain exemptions may be removed (CalRecycle 2018b).

In September 2016, the governor signed SB 1383 (Lara, Chapter 395, Statutes of 2016) establishing methane emissions reduction targets as part of a statewide effort to reduce emissions of short-lived climate pollutants (SLCPs).

CARB's 2017 Scoping Plan acknowledges that greater waste diversion from landfills as a key measure for achieving statewide GHG emission targets (CARB 2017a:5, 89–90).

California Sustainable Freight Action Plan

The California Sustainable Freight Action Plan strives to improve the efficiency of freight transport in California, including the GHG efficiency (California Department of Transportation et al. 2016:5-6). As recognized in the Scoping Plan, the California Sustainable Freight Action Plan is intended to improve freight system efficiency and help the state transition to zero and near-zero emission technologies. The California Sustainable Freight Action Plan is recognized in CARB's 2017 Scoping Plan as a key measure for achieving statewide GHG emission targets (CARB 2017a:25).

California Phase 2 Standards for the Federal GHG Emissions and Fuel Efficiency Requirements for Medium- and Heavy-Duty Engines and Vehicles

After EPA enacted its Phase 2 Standards for medium- and heavy-duty engines, as discussed in the federal regulatory setting above, California enacted its own Phase 2 standards for GHG emissions that align closely with the federal Phase 2 standards except for minor differences. California's Phase 2 standards were officially approved by CARB in February 2018, with the California Office of Administrative Law giving its final approval in February 2019. The California Phase 2 standards became effective April 1, 2019. Reductions in GHGs from California's Phase 2 standards are recognized in CARB's 2017 Scoping Plan (CARB 2017a:25).

Low Carbon Fuel Standard

The Low Carbon Fuel Standard is recognized in CARB's 2017 Scoping Plan as a key regulation for achieving statewide GHG emission targets (CARB 2017a:25). In January 2007, EO S-01-07 established a Low Carbon Fuel Standard (LCFS). The EO calls for a statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020, and that a LCFS for transportation fuels be established for California. The LCSF applies to all refiners, blenders, producers, or importers ("Providers") of transportation fuels in California, including fuels used by off-road construction equipment (Wade, pers. comm., 2017). The LCFS is measured on the total fuel cycle and may be met through market-based methods (e.g., providers exceeding the performance required by an LCFS receive credits that may be applied to future obligations or traded to Providers not meeting LCFS).

In June 2007, CARB adopted the LCFS as a Discrete Early Action item under AB 32 pursuant to Health and Safety Code Section 38560.5, and in April 2009, CARB approved the new rules and carbon intensity reference values with new regulatory requirements taking effect in January 2011. The standards require providers of transportation fuels to report on the mix of fuels they provide and demonstrate they meet the LCFS intensity standards annually. This is accomplished by ensuring that the number of "credits" earned by providing fuels with a lower carbon intensity than the established baseline (or obtained from another party) is equal to or greater than the "deficits" earned from selling higher intensity fuels.

After some disputes in the courts, CARB re-adopted the LCFS regulation in September 2015, and the LCFS went into effect on January 1, 2016.

Renewable Electricity Generation Targets

The State has passed legislation requiring the increasing use of renewables to produce electricity for consumers. California utilities are required to generate 33 percent of their electricity from renewables by 2020 (SB X1-2 of 2011); 52 percent by 2027 (SB 100 of 2018); 60 percent by 2030 (also SB 100 of 2018); and 100 percent by 2045 (also SB 100 of 2018). These regulations are recognized in CARB's 2017 Scoping Plan as critical to achieving statewide GHG emission targets (CARB 2017a:25).

LOCAL

Solano County General Plan

The Solano County General Plan contains the following goals, objectives, and policies that could be applicable to the project (Solano County 2008):

GOAL PF.G-1: Provide adequate public services and facilities to accommodate the level of development planned by the County.

- ► **PF.P-25**: Collaborate with the state, regional, and city agencies and landfill operators to ensure that the capacity of available landfills is sufficient. Prioritize capacity for waste generated within the County. Ensure that programs are designed to meet or exceed state requirements for landfill capacities.
- ► Policy PF.P-26: Implement and participate in local and regional programs that encourage source reduction and recycling of solid and hazardous wastes in Solano County.
- ► Policy PF.P-27: Require responsible waste management practices, including recycling and composting. Coordinate with service providers to compost green waste and encourage local farmers to use this.
- ► Policy PF.P-28: Promote technologies that allow the use and reuse of solid waste, including biomass or biofuel as an alternative energy source.

Solano County Climate Action Plan

The County's General Plan, adopted in 2008, required the County to develop a Climate Action Plan and accompanying Sea Level Rise Strategic Program in through Program HS-1.73. The County's Climate Action Plan was adopted in June 2011 and includes countywide GHG inventory and projections for a baseline year of 2005. In 2005 transportation-related activities contributed to approximately 51 percent of the countywide emissions. Electricity and natural gas consumption contributed 22 percent of the emissions. Agricultural operations made up approximately 21 percent of the inventory, the water sector contributed approximately four percent, and the waste sector accounted for approximately two percent. In compliance with the Scoping Plan, Solano County set a target to reduce countywide GHG emissions by 20 percent below 2005 baseline emission levels by 2020 (Solano County 2011). While this target aligns with the statewide target mandated by AB 32 of 2006 (i.e., reduce statewide emissions to 1990 levels by 2020), the Climate Action Plan has not been updated to establish a countywide target that is aligned with the statewide target mandated by SB 32 of 2016 (i.e., 40 percent below 1990 levels by 2030).

The County's Climate Action Plan sets for measures and actions that, along with State policies, would reduce countywide emissions to meet the 2020 target. Specific measures related to solid waste include:

- ► Measure E-5: Work with CalRecycle, Bay Area waste agencies, other jurisdictions, and interested private sector parties to develop an agricultural and food waste-to-energy biomass facility in Solano County.
- ► Measure W-1: Work with the Local Task Force and other organizations to create a zero-waste plan and provide public education regarding zero-waste strategies and implementation.
- Measure W-2: Adopt a Construction and Demolition Ordinance to require 65 percent of construction and demolition debris to be recycled or reused by 2020.
- ► Measure W-4: Facilitate CalRecycle and CARB's implementation of the Landfill Methane Capture Strategy by requiring landfills to capture methane to the greatest extent feasible.

Solano County Integrated Waste Management Plan

The Solano County Integrated Waste Management Plan was developed pursuant to AB 75, which required each state agency and large state facility to develop such a plan. The following policy in the plan is relevant to the project and climate change:

► Transform the current system of producing, consuming, and disposing of material goods to a new system that conserves natural resources and landfill capacity, and that is sustainable for present and future generates. This

new system shall place the greatest emphasis on reducing the generation of solid waste at the source of generation; secondary emphasis on recycling or composting the maximum feasible amount of that solid waste that is generated; and, finally, disposing of the residue that cannot be reduced, recycled or composted in sanitary landfills that meet current regulatory design criteria for environmental protection.

Yolo-Solano Air Quality Management District Plans and Programs

The Yolo-Solano Air Quality Management District (YSAQMD) maintains a climate protection program for the purposes of analyzing climate change impacts as it pertains to CEQA. YSAQMD is in the process of integrating climate protection plans and programs into existing grant programs, CEQA review, and regulations. YSAQMD recommends that impacts to climate change be evaluated for every CEQA project; however, at the time this Subsequent Environmental Impact Report (SEIR) was prepared, no climate change regulations have been adopted for use at a local level.

4.7.2 Environmental Setting

PHYSICAL SCIENTIFIC BASIS OF GREENHOUSE GAS AND CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected toward space. The absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-generated emissions of these GHGs in excess of natural ambient concentrations are found to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. Per the Intergovernmental Panel on Climate Change (IPCC), it is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropomorphic increase in GHG concentrations and other anthropomorphic forcing (IPCC 2014:5). This warming is observable considering the 20 hottest years ever recorded occurred within the past thirty years (McKibben 2018). Additionally, the hottest June ever recorded happened in 2019 (Duncan 2019).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas most pollutants with localized air quality effects have relatively short atmospheric lifetimes (approximately one day), GHGs have long atmospheric lifetimes (one year to several thousand years). GHGs persist in the atmosphere long enough to be dispersed around the globe. Although the lifetime of any GHG molecule depends on multiple variables and cannot be determined with perfect certainty, it is understood that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO₂ emissions, approximately 55 percent are estimated to be sequestered through ocean and land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO₂ emissions remain stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs in the atmosphere responsible for climate change is not precisely known, but it is enormous. No single project alone would measurably contribute to an incremental change in the global average temperature or to global or local climates or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

GREENHOUSE GAS EMISSION SOURCES AND SINKS

As discussed previously, GHG emissions are attributable in large part to human activities. CO₂ is the main byproduct of fossil fuel combustion. Methane, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices (e.g., cattle and other ruminants), hydraulic fracturing, organic material decomposition in landfills, and the burning of forest fires (Black et al. 2017). Nitrous oxide emissions are largely attributable to agricultural practices and soil management. CO₂ sinks, or reservoirs, include vegetation and the ocean, which absorb CO₂ through sequestration and dissolution (CO₂ dissolving into the water); respectively, these are the two of the most common processes for removing CO₂ from the atmosphere.

The total GHG inventory for California in 2016 was 429 million metric tons of CO₂ equivalents (MMTCO₂e) (CARB 2018a). This is less than the 2020 target established by Assembly Bill 32 (discussed in Section 4.7.2, "Regulatory Setting") of 431 MMTCO₂e equal to the inventory for 1990 (CARB 2018b:1). Table 4.7-1 summarizes the statewide GHG inventory for California.

Sector	MMTCO ₂ e (Percent)
Transportation	176 (41)
Industrial	99 (23)
Electricity generation (in state)	43 (10)
Electricity generation (imports)	26 (6)
Agriculture	34 (8)
Residential	30 (7)
Commercial	21 (5)
Not specified	1 (<1)

Table 4.7-1 Statewide GHG Emissions by Economic Sector

Notes: MMTCO₂e = million metric tons of carbon dioxide equivalent

Source: CARB 2018a

EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

According to the IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature will increase by 1.5 degrees Celsius (°C) (2.7 degrees Fahrenheit [°F]) by 2040. This 1.5 °C warming represents a global average indicating that portions of the earth will experience more dramatic warming than others. Oceans, which support high specific heat, will experience less dramatic warming as compared to continents, particularly in inland regions.

According to *California's Fourth Climate Change Assessment*, if global GHGs are reduced at a moderate rate, California will experience average daily high temperatures that are warmer than the historic average by 2.5 °F from 2006 to 2039, by 4.4 °F from 2040 to 2069, and by 5.6 °F from 2070 to 2100; and if GHG emissions continue at current rates then California will experience average daily high temperatures that are warmer than the historic average by 2.7 °F from 2006 to 2039, by 5.8 °F from 2040 to 2069, and by 8.8 °F from 2070 to 2100 (OPR et al. 2019:23). The potential effects of this warming in California are well documented.

Since its previous climate change assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012–2016, an almost non-existent Sierra Nevada winter snowpack in 2014-2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures (OPR et al. 2019:56). According to the California Natural Resources Agency's (CNRA's) *Safeguarding California Plan: 2018 Update*, California experienced the driest 4-year statewide precipitation on record from 2012 through 2015; the warmest years on average in 2014, 2015, and 2016; and the smallest and second smallest Sierra

snowpack on record in 2015 and 2014 (CNRA 2018:55). In contrast, the northern Sierra Nevada experienced its wettest year on record during the 2016–2017 water year (CNRA 2018:64). The changes in precipitation exacerbate wildfires throughout California through a cycle of high vegetative growth coupled with dry, hot periods which lowers the moisture content of fuel loads. As a result, the frequency, size, and devastation of forest fires increases. In November 2018, the Camp Fire completely destroyed the town of Paradise in Butte County and caused 85 fatalities, becoming the state's deadliest fire in recorded history. Moreover, changes in the intensity of precipitation events following wildfires can also result in devastating landslides. In January 2018 following the Thomas Fire, 0.5 inches of rain fell over just 5 minutes in Santa Barbara causing destructive mudslides formed from the debris and loose soil left behind by the fire. These mudslides resulted in 21 deaths.

As temperatures increase, the amount of precipitation falling as rain rather than snow also increases, which could lead to increased flooding because water that would normally be held in the snowpack of the Sierra Nevada and Cascade Range until spring would flow into the Central Valley during winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2018:190–192).

Temperature increases and changes to historical precipitation patterns will likely affect ecologically productivity. Existing habitats may migrate from climatic changes where possible, and those that lack the ability to retreat will be severely threatened. Altered climatic conditions dramatically endangers the survival of arthropods which could have cascading effects throughout ecosystems (Lister and Garcia 2018). Conversely, a warming climate may support the populations of other insects such as ticks and mosquitos, which transmit diseases harmful to human health such as the Zika virus, West Nile virus, and Lyme disease (European Commission Joint Research Centre 2018).

Changes in temperature, precipitation patterns, extreme weather events, wildfires, and sea-level rise have the potential to threaten transportation and energy infrastructure, crop production, forests and rangelands, and public health (CNRA 2018:64, 116–117, 127; OPR 2019:63). The effects of climate change will also have an indirect adverse impact on the economy as more severe natural disasters cause expensive, physical damage to communities and the state.

Additionally, adjusting to the physical changes associated with climate change can produce mental health impacts such as depression and anxiety.

Cal-Adapt is a climate change scenario planning tool developed by the California Energy Commission (CEC) that downscales global climate model data to local and regional resolution under two emissions scenarios. The Representative Concentration Pathway (RCP) 8.5 scenario represents a business-as-usual future emissions scenario, and the RCP 4.5 scenario represents a future with reduced GHG emissions.

The project area experienced an annual average high temperature of 74.8°F between 1961 and 1990. Under the RCP 4.5 scenario, the project area's annual average high temperature is projected to increase by 5.3°F to 80.1°F by 2050 and increase an additional 0.3°F to 80.4°F by 2099 (Cal-Adapt 2019). Under the RCP 8.5 scenario, the project area's annual average high temperature is similarly projected to increase by 5.3°F to 80.1°F by 2050 and increase an additional 5.0°F to 85.1°F by 2099 (Cal-Adapt 2019). Average annual minimum temperatures are expected to rise within a similar range.

The project area experienced an average precipitation of 17.7 inches per year between 1961 and 1990. Under the RCP 4.5 scenario, the county is projected to experience an increase of 11.3 inches to 29.0 inches per year by 2050 and decrease to 21.2 inches per year by 2099 (Cal-Adapt 2019). Under the RCP 8.5 scenario, the project area is projected to experience an increase of 10.9 inches to 28.6 inches per year by 2050 and decrease to 27.3 inches per year by 2099 (Cal-Adapt 2019).
4.7.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

The evaluation of project-related GHG emissions is based on information provide as part of an Air Quality Impact Assessment prepared by SCS Engineers (SCS Engineers 2019) and supplemental calculations. The Air Quality Impact Assessment is provided in Appendix D. The supplemental emissions calculations are provided in Appendix E.

Construction-related emissions of GHGs were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2 computer program (CAPCOA 2016). CalEEMod was used to calculate emissions generated during the construction phase of the project. Modeling was based on project-specific information (e.g., schedule, area of disturbance), where available, and default values in CalEEMod that are based on the project's location, land use type, and type of construction activity. Specific CalEEMod modeling inputs and assumptions can be found in the Air Quality Impact Assessment in Appendix D.

GHG emissions associated with the storage and decomposition of solid waste at the Recology Hay Road (RHR) Landfill were estimated using the Landfill Gas Emissions Model (LandGEM), developed and maintained by the EPA (EPA 2005). Emissions generated by the additional solid waste decomposition were calculated by comparing the estimated emissions generated by existing operations to the estimated emissions generated by the existing landfill plus additional waste accepted as a result of the project. The modeling inputs are provided in Appendices C and D of the Air Quality Impact Assessment (SCS Engineers 2019), which is provided in Appendix D of this Draft SEIR.

Operational mobile-source GHG emissions were estimated using project-specific information, where available, and default values in CARB's Emission Factor Web Database, version 1.0.2 (EMFAC2017) (CARB 2017d) based on the project's location and land use characteristics. Mobile-source emissions were estimated using the number of project-generated vehicle trips provided by the traffic analysis used to support Section 4.11, "Transportation and Circulation" (KD Anderson 2018:14), which is provided in Appendix G. Operational emissions from all sources were estimated, and detailed model assumptions and inputs for these calculations can be found in Appendix E.

The project's consistency with adopted plans, and policies aimed at reducing GHG emissions, including CARB's 2017 Scoping Plan, is assessed qualitatively based on applicable regulations.

THRESHOLDS OF SIGNIFICANCE

Because the issue of global climate change is inherently a cumulative issue, the contribution of project-related GHG emissions to climate change is addressed as a cumulative impact.

State CEQA Guidelines Section 15064 and Appendix G recommend that a lead agency consider a project's consistency with relevant, adopted plans, and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. Under Appendix G of the State CEQA Guidelines, implementation of a project would result in a cumulatively considerable contribution to climate change if it would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment, or
- conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

In California, some counties, cities, and air districts have developed guidance and thresholds for determining the significance of GHG emissions that occur within their jurisdiction. Solano County is the CEQA lead agency for the project and is, therefore, responsible for determining whether project-related GHG emissions would be a cumulatively considerable contribution to climate change.

At the time of writing this SEIR, Solano County and YSAQMD do not have recommended thresholds or approaches for evaluating a project's GHG emissions. CARB has suggested that "[I]ead agencies have the discretion to develop evidence-based numeric thresholds consistent with the 2017 Scoping Plan, the State's long-term GHG goals, and

climate change science." Solano County has developed a Climate Action Plan which sets GHG reduction targets consistent with state GHG reduction policies for the year 2020. However, the County has not established quantitative thresholds applicable to a project-specific analysis. The County's Climate Action Plan includes numerous measures and actions that would help reduce countywide emissions to meet the identified 2020 target, which is aligned with the statewide target mandated by AB 32 of 2006 (i.e., reduce statewide emissions to 1990 levels by 2020). However, the County's Climate Action Plan has not been updated to establish a countywide target that is aligned with the statewide target mandated by SB 32 of 2016 (i.e., 40 percent below 1990 levels by 2030). For this reason, this analysis examines whether the project would conflict with CARB's 2017 Scoping Plan.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.7-1: Generation of Greenhouse Gas Emissions and Consistency with GHG Reduction Targets/Plan

The project would result in increased GHG emissions contained in landfill gas and increased GHG emissions generated by truck hauling. All the GHG-emitting activities that would operate with the project are subject to regulations developed for the purpose of reducing GHG emissions and/or are consistent with GHG reduction policies identified in CARB's 2017 Scoping Plan to help California meet its statewide GHG emission targets. Therefore, the project would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions. Because the RHR Landfill is both infrastructure and an accessory land use that receives waste generated by residential and commercial land uses throughout the Bay Area and Sacramento Region, thereby supporting a large population and a large quantity of economic activity, its emissions of GHGs would not be substantial. For these reasons, project-related GHG emissions would not result in a cumulatively considerable contribution to climate change and this impact would be **less than significant**.

Because the County and YSAQMD have not developed guidance or a threshold for quantifying a project's GHG emissions, and because, at the time of writing this SEIR, none of the air districts in California have developed a quantitative threshold that is aligned with the statewide GHG target mandated by SB 32 of 2016, this analysis presents the estimate of project-related GHG emission and qualitatively assesses whether the project would be aligned with CARB's 2017 Scoping Plan. GHG emissions would be generated during project construction, from the landfill after the project becomes operational, and from the increase in trucks hauling solid waste to the landfill. These sources of emissions are discussed separately below.

Construction-Related Emissions

Project-related construction activities would generate GHG emissions. Off-road construction equipment, materials transport, and worker commutes during construction of the project would result in tailpipe emissions of GHGs from fuel combustion. Refer to Appendix A of the Air Quality Impact Assessment in Appendix D to this SEIR for detailed modeling inputs (e.g., duration, equipment types, equipment quantities). Based on modeling conducted for the project, it is estimated that construction would generate approximately 957 MTCO₂e over the duration of the construction period. Based on previously accepted thresholds for construction-related GHG emissions by YSAQMD and BAAQMD (i.e., 1,100 MTCO₂e) (Jones, pers. comm., 2015), this level of emissions is not considered substantial. Further, onsite construction would likely be completed by onsite construction equipment that would otherwise be operating elsewhere within the RHR Landfill, and as a result, construction-related emissions are considered nominal.

Landfill-Generated Methane Emissions

General operations of the landfill would not change except that the allowable solid waste received by the landfill would increase, as described in Chapter 3, "Project Description," of this SEIR. All operational emissions from stationary sources would be regulated and monitored through YSAQMD permitting process. Landfilling of organic materials generates GHG emissions through the anaerobic breakdown of these materials. Methane is the primary GHG emission generated by landfilled material. As explained in CARB's 2017 Scoping Plan, landfill emissions are driven by the total waste-in-place, rather than year-to-year fluctuation in annual deposition of solid waste, as the rate and

volume of gas produced during decomposition depends on the characteristics of the waste and a number of environmental factors. As a result, waste disposed in a given year contributes to emissions that year and in subsequent years (CARB 2017a:88). The level of methane emissions associated with the storage and decomposition of solid waste in the landfill due to the project was estimated using the Landfill Gas Emissions Model (LandGEM) (EPA 2005) and is summarized in Table 4.7-2. The modeling inputs are provided in Appendices C and D of the Air Quality Impact Assessment (SCS Engineers 2019), which is provided in Appendix D to this SEIR. As shown in Table 4.7-2, the level of GHG emissions associated with project operations would be approximately 80,288 MT CO₂e/year.

Operation of the expanded landfill would be considered consistent with the 2017 Scoping Plan because the project would include the use of landfill gas capture and control systems that meet all applicable requirements of CARB's Short-Lived Climate Pollutant Reduction Strategy, the California State Plan for Municipal Solid Waste Landfills, and the landfill methane control measures and reporting requirements approved by CARB. In addition, the methane-containing landfill gas captured from the landfill would continue to be used to produce electricity, an operation that will help meet the state-wide renewable electricity targets that are a key component to achieving the statewide GHG emission targets. Moreover, the project would be consistent with Measure W-4 of the Solano County Climate Action Plan, which states that the County shall facilitate CalRecycle and CARB's implementation of the Landfill Methane Capture Strategy by requiring landfills to capture methane to the greatest extent feasible.

Vehicle Type	GHG Emissions (MTCO2e/year)		
Stationary Sources			
Landfill Gas ¹	79,200		
Flare	207		
Diesel Generator	881		
Subtotal	80,288		
Mobile Sources			
Self-Haul Trucks	193		
Packer Trucks	788		
Transfer Trucks	5,890		
Subtotal	6,870		
Total	87,158		

Table 4.7-2	Operational	Greenhouse	Gas	Emissions
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Notes: Totals may not add due to rounding. GHG = greenhouse gas; MTCO₂e/year = metric tons of carbon dioxide–equivalent per year

^{1.} The level of landfill gas GHG emissions represents the peak annual level of GHG emissions associated with the project. Landfill emissions are driven by the total waste-in-place, rather than year-to-year fluctuation in annual deposition of solid waste.

For detailed input parameters and modeling results for the stationary-sour emissions see Appendices C and D of the Air Quality Impact Assessment (SCS Engineers 2019), which is provided in Appendix D to this SEIR

See Appendix E for detailed calculations of mobile-source emissions.

Source: SCS Engineers (stationary source) and Ascent Environmental 2019 (mobile source)

Mobile-Source Emissions

The increase in average daily throughput associated with the project would result in approximately 195 additional round trips per day by haul trucks relative to existing conditions, as explained in the traffic impact analysis prepared for the project (KD Anderson 2018:13). Table 4.7-2 also summarizes the GHG emissions that would be generated by this increase in truck travel in 2020, which is the earliest year in which the project could become fully operational, although the increase in throughput would likely occur gradually over a much longer period of time. Emissions were calculated using EMFAC2017 and detailed modeling parameter are included in Appendix E. As shown in Table 4.7-2, the increase in truck travel associated with the project would generate approximately 6,870 MT CO₂e/year.

One of the factors that contributes to this level of project-related mobile-source emissions is the fact that the transfer trucks that would haul waste to the landfill would be coming from distant locations in the Bay Area and Sacramento Region. It is estimated that the project would generate approximately 91 additional daily round trips by transfer trucks (DKD Anderson 2019:13) with an average round-trip distance of approximately 120 miles (SCS Engineers 2019:41). This amounts to transfer trucks traveling approximately 10,920 miles per day. One of the reasons the level of vehicle travel associated with landfill operations is high is the constraints of siting landfills. In California, the siting of landfills is strictly regulated by CalRecycle, and landfill operations must be remote enough from homes, schools, airports, and other sensitive human activities to prevent the exposure of people to adverse health effects and offensive odors (CalRecycle 2018c). Also, multiple air districts recommend that residential land uses and other sensitive receptors not be located within 1–2 miles of a landfill to prevent exposure of people to offensive odors (YSAQMD 2007:14; BAAQMD 2017:3-4; SMAQMD 2018:7-1).

Though the Scoping Plan does not include any measures that specifically address the GHG emissions associated with the hauling of solid waste to landfills by truck, GHG emissions from truck hauling are being addressed in multiple ways at the regulatory level to help California achieve its mandated statewide GHG emission targets. For instance, the packer trucks and transfer trucks would be subject to California's special Phase 2 standards of the federal GHG and fuel efficiency standards for medium- and heavy-duty engines, a set of standards that is recognized in CARB's 2017 Scoping Plan as important to helping achieve the statewide GHG emission targets (CARB 2017a:25). Moreover, based on CARB's Emission Factor Web Database, version 1.0.2 (EMFAC2017), CO₂ emission rates for Solid Waste Collection Vehicles are projected to decrease by approximately 34 percent between 2020 and 2050 (CARB 2017d). Related calculations are included in Appendix E.

In addition, any truck activity associated with the project would rely on fuels that are subject to the state's low carbon fuels standard, which addresses the carbon intensity of automotive fuels used in California and is also recognized as a key GHG reduction measure in CARB's 2017 Scoping Plan (CARB 2017a:ES7, 25). Also, the project would not alter the system of collecting solid waste from local land uses with packer trucks, sorting and consolidating the collected material at transfer station/material recovery facilities, and then hauling only non-organic, non-recyclable waste to a landfill in higher-capacity transfer trucks—a system considered to be consistent with the goal of improving freight system efficiency outlined in the California Sustainable Freight Action Plan (California Department of Transportation et al. 2016:5-6). The presence of transfer stations/material recovery facilities reduces the amount of waste hauled to landfills and reduces the number of trips traveling to and from landfills by combining the loads of several individual packer collection trucks into a single, larger load (EPA 2018b).

In summary, because project-related truck activity would be subject to stringent engine emission standards and low carbon fuel standards, and be consistent with GHG-efficient freight hauling practices—all of which are recognized in CARB's 2017 Scoping Plan as measures to help achieve statewide GHG emission targets—the project's trucking activity would not conflict with California's ability to achieve statewide GHG emission targets.

All the GHG-emitting activities that would operate with the project are subject to regulations developed for the purpose of reducing GHG emissions and/or consistent with GHG reduction policies identified in CARB's 2017 Scoping Plan to help California meet its statewide GHG emission targets. Therefore, the project would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

As cities and counties served by this landfill continue to implement waste reduction actions to meet solid waste diversion requirements, less solid waste would be generated and subsequently transported to the landfill where it would generate methane emissions. The project would not result in more solid waste being generated and, therefore, would not conflict with the state's solid waste diversion regulations. Furthermore, the project includes an upgrade to the existing system for sorting, separating, and processing construction and demolition (C&D) materials. While the RHR Landfill is currently permitted to receive C&D waste stream, the LUP modification would authorize the further sorting of this waste stream, which would allow for greater recovery of recyclable materials and greater diversion of materials from landfill disposal. This component of the project would support attainment of statewide solid waste diversion targets and CalRecycle's 75 Percent Strategy.

The RHR Landfill is both an infrastructure and an accessory land use that serves the broader region. It receives waste generated by residential and commercial land uses throughout the Bay Area and Sacramento Region, thereby supporting a large population and a large quantity of economic activity. Landfills play a vital role in California's waste management system and are necessary for the safe and regulated disposal of wastes that cannot be reduced, reused, or recycled. Thus, in this regional context, the level of GHG emissions associated with the project would not be substantial. For these reasons, project-related GHG emissions would not be a cumulatively considerable contribution to climate change, and this impact would be **less than significant**.

Moreover, the GHG emissions associated with the decomposition of solid waste generated by new land use development projects are accounted for when new development undergoes planning review and CEQA review. The California Emissions Estimator Model (CalEEMod), for instance, which is used to estimate the GHG emissions associated with new land use development projects in support of CEQA review, includes a module that estimates the levels of GHG emissions associated with the amount of landfilled solid waste that would be generated by the new land uses (CAPCOA 2016). If these emissions were also accounted for in projects that involve the development or expansion of a landfill, then they would be double counted.

Mitigation Measures

No mitigation is required.

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4.8 HAZARDS AND HAZARDOUS MATERIALS

This section evaluates the potential risks to human health and safety from hazardous materials, fire hazards, and public health hazards associated with implementation of the proposed project. This section describes the regulatory background and existing environmental conditions at the project site and identifies potential impacts of the proposed project. Potential impacts related to toxic air contaminants are discussed in Section 4.2, "Air Quality," and potential effects related to the release of hazardous materials on water quality, including leachate production and waste discharge, are discussed in Section 4.9, "Hydrology and Water Quality."

No comments pertaining to hazards or hazardous materials were received in response to the Notice of Preparation for the proposed project.

4.8.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

Toxic Substances Control Act/Resource Conservation and Recovery Act/ Hazardous and Solid Waste Act

The primary federal agency regulating the generation, transport, and disposal of hazardous substances is U.S. Environmental Protection Agency (EPA), under the authority of the Federal Toxic Substances Control Act of 1976 (15 U.S. Code [USC] 2605) and the Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 et seq.). RCRA established an all-encompassing federal regulatory program for hazardous waste that is administered in California by the Department of Toxic Substances Control (DTSC). Under RCRA, DTSC regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Amendments of 1984, which specifically prohibits the use of certain techniques for the disposal of various hazardous waste. The Federal Emergency Planning and Community Right-to-Know Act of 1986 imposes planning requirements to help protect local communities in the event of accidental release of an extremely hazardous substance.

U.S. Department of Transportation Hazardous Materials Transport Act

The U.S. Department of Transportation, in conjunction with EPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to transportation of hazardous materials. The Hazardous Materials Transportation Act of 1974 (49 USC 5101) directs the U.S. Department of Transportation to establish criteria and regulations regarding the safe storage and transportation of hazardous materials. The Code of Federal Regulations (CFR) 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

Occupational Safety and Health Administration

The mission of the Occupational Safety and Health Administration (OSHA) (Title 29 CFR 1910) is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. OSHA staff establish and enforce protective standards and reach out to employers and employees through technical assistance and consultation programs.

STATE PLANS, POLICIES, AND REGULATIONS

Solid Waste Facility Operating Standards

Title 14 of the California Code of Regulations (CCR) contains regulations of the California Integrated Waste Management Board (CIWMB) pertaining to nonhazardous waste management in the state. Title 14 establishes

minimum standards for solid waste handling and disposal (Chapter 3) and established guidelines for enforcement of solid waste standards and administration of solid waste facilities permits (Chapter 5).

Landfill Regulations

Title 27 of the CCR contains the regulations of CIWMB and State Water Resources Control Board (SWRCB) pertaining to waste disposal on land. Chapter 3, Subchapter 4 of Title 27 establishes operating criteria for all landfills and disposal sites. Regulations pertaining to public health and safety issues include the following:

- 20810 Vector Control: Requires implementation of adequate measures to control or prevent the propagation, harborage, or attraction of flies, rodents, or other vectors and to minimize bird problems at the site.
- 20870 Hazardous Wastes: Requires owners or operators of all municipal solid waste landfill units to implement a program at the facility for detecting and preventing the disposal of regulated hazardous wastes. This program must include, at a minimum, radon inspections of incoming loads, records of any inspections, training of facility personnel to recognize regulated hazardous wastes and polychlorinated biphenyl (PCB) wastes, and notification of the Local Enforcement Agency, the Director of DTSC, or its delegated agent, and the Regional Water Quality Control Board (RWQCB), if a regulated hazardous waste or PCB waste is discovered at the facility.
- ► 20919 Landfill Gas Controls: Establishes requirements designed to detect and limit the migration of landfill gas (LFG). If monitoring indicates methane gas movement away from the site, the owner is required to construct a gas control system approved by the local enforcement agency, local fire control agency, or CalRecycle within a specific time period. This requirement can be waived by the requiring agency if satisfactory evidence is presented indicating that adjacent properties are safe from hazard or nuisance cause by methane gas movement.
- 20919.5 Explosive Gases Controls: This section sets methane concentration limits for facility structures and at the property boundary. Owners or operators of all municipal solid waste landfill units must ensure that the concentration of methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures and that the concentration of methane gas does not exceed the lower explosive limit for methane at the facility property boundary. It also establishes monitoring requirements (at minimum, conducted quarterly) and actions to be taken if gas levels exceed the specified limits above, among other provisions.
- ► 21810 Clean-Closure: Allows the operator of a solid waste landfill to submit a closure plan for solid waste landfills that will be closed by removing solid wastes and contaminated soils (clean closure). The purpose of the plan for clean closure is to establish a closure method for a disposal site that will partially or completely remove solid wastes and contaminated soils to provide remediation of a threat to public health and safety, reduce or eliminate the need for postclosure maintenance, and prepare the site for postclosure land uses.

In addition, Title 27, Environmental Protection; Division 2, Solid Waste; Chapter 3, Criteria for All Waste Management Units, Facilities, and Disposal Sites; Subchapter 2, Siting and Design; Article 2, SWRCB Waste Classification and Management regulates the acceptance of sewage sludge at landfill facilities including setting requirements for the percentage of solids present and minimum ratio for solids to liquids. Title 27 also requires landfill facilities accepting sewage sludge to have a leachate collection and removal system.

In Solano County, the Solano County Department of Resource Management is the local enforcement agency (LEA). While the County Board of Supervisors initially selects the department that will be the LEA, the department must be certified by CalRecycle.

Hazardous Waste Control Act

The Hazardous Waste Control Act created the State hazardous waste management program. It is similar to, but more stringent than, the federal RCRA program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling treatment, storage and disposal facilities; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of

such waste. Under the Hazardous Waste Control Act and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with the DTSC.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) requires the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a Certified Unified Program Agency (CUPA). The following Program Elements are consolidated under the Unified Program:

- ► Hazardous Waste Generator and Onsite Hazardous Waste Treatment Programs;
- ► Aboveground Petroleum Storage Tanks (Spill Prevention Control and Countermeasures Plan);
- Hazardous Materials Release Response Plans and Inventory Program (Hazardous Materials Disclosure or "Community-Right-To-Know"), Hazardous Material Plans;
- ► California Accidental Release Prevention Program and Risk Management Plan;
- Underground Storage Tank Program; and
- ► Uniform Fire Code Plans, Hazardous Materials Management, and Inventory Requirements.

The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more program elements in coordination with the CUPA.

California Department of Toxic Substances Control

DTSC implements and oversees the Hazardous Waste and Substances Sites (Cortese) List. The Cortese List is used by state agencies, local agencies, and project developers to ensure compliance with CEQA requirements for providing information about the location of hazardous materials release sites. The list is updated at least annually, as required under CEQA, with input from DTSC as well as other state and local government agencies that are required to update and submit hazardous materials release information and updates. Cortese list information is available through DTSC's EnviroStor website, and via the SWRCB's Geotracker website.

California Office of Emergency Services

To protect public health and safety and the environment, the California Office of Emergency Services is responsible for establishing and managing statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials. Basic information on hazardous materials handled, used, stored, or disposed of (including location, type, quantity, and health risks) needs to be available to firefighters, public safety officers, and regulatory agencies and needs to be included in business plans to prevent or mitigate the damage to the health and safety of persons and the environment from the release or threatened release of these materials into the workplace and environment. These regulations are covered under Chapter 6.95 of the California Health and Safety Code Article 1–Hazardous Materials Release Response and Inventory Program (Sections 25500 to 25520) and Article 2–Hazardous Materials Management (Sections 25511 to 25543.3).

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace in California. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

Hazardous Materials Handling and Transport

The California Hazardous Materials Release Response Plans and Inventory Law of 1985 requires preparation of hazardous materials business plans and disclosure of hazardous materials inventories. A business plan includes an inventory of hazardous materials handled, facility floor plans showing where hazardous materials are stored, an emergency response plan, and provisions for employee training in safety and emergency response procedures (California Health and Safety Code, Division 20, Chapter 6.95, Article 1). Statewide, DTSC has primary regulatory responsibility for management of hazardous materials, with delegation of authority to local jurisdictions that enter into agreements with the state. Local agencies are responsible for administering these regulations.

Several state agencies regulate the transportation and use of hazardous materials to minimize potential risks to public health and safety, including Cal/EPA and the California Emergency Management Agency. The California Highway Patrol and California Department of Transportation enforce regulations specifically related to the transport of hazardous materials. Together, these agencies regulate container types and license hazardous waste haulers for hazardous waste transportation on public roadways.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County General Plan

The project site is located within the area covered by the *Solano County General Plan* (Solano County 2008). Hazards are discussed in the Public Health and Safety chapter of the General Plan, which includes the following goals and policies relevant to the proposed project:

- ► Policy HS.P-26: Minimize the risks associated with transporting, storing, and using hazardous materials through methods that include careful land use planning and coordination with appropriate federal, state, or County agencies.
- ► Policy HS.P-29: Promote hazardous waste management strategies in this order of priority: source reduction, recycling and reuse, onsite treatment, offsite treatment, and residuals disposal.
- ► Policy HS.P-31: Encourage regional efforts to implement alternatives to land disposal of untreated hazardous wastes, and participate in inter-jurisdictional agreements that balance the economic efficiencies of siting facilities with the responsibility of each jurisdiction to manage its fair share of hazardous wastes generated within the region.
- **Policy HS.P-32**: Work to ensure the adequacy of disaster response and coordination in the county and the ability of individuals to survive disasters.
- ► Policy HS.P-33: Plan and designate evacuation and aid routes. Work to create a comprehensive circulation system that is effective in allowing emergency access to and from all parts of the county and which provides alternative routes during unexpected events such as flooding, fires, or hazardous materials accidents that require evacuation.
- ► Policy HS.P-35: Encourage full coordination and communication between federal, state, and local agencies regarding disaster planning and preparedness.

Solano County Department of Resources Management, Environmental Health Services

The Solano County Department of Public Health, Division of Environmental Health is certified by the Department of Toxic Substances Control (DTSC) as the Certified Unified Program Agency (CUPA) that administers the following programs:

- California Accidental Release Program (CalARP): The program aims to prevent the release of regulated substances into the environment.
- Hazardous Materials and Waste Program: The program enforces laws relevant to hazardous materials and has the following major elements:

- Hazardous Waste Control Act compliance,
- Hazardous Materials Business Plan, and
- Emergency response.

Solano County Emergency Operations Plan

The Emergency Operation Plan (EOP) addresses Solano County's planned response to extraordinary emergency situations associated with natural, technological and human caused emergencies or disasters within or affecting Solano County. This EOP is the principal guide for Solano County's response to, management of, and recovery from real or potential emergencies and disasters occurring within its designated geographic boundaries (Solano County 2017: 10).

4.8.2 Environmental Setting

DEFINITIONS OF TERMS

The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including waste, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases). The term "hazardous material" is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (California Health and Safety Code Chapter 6.95, Section 25501[o]).

If improperly handled, hazardous materials and wastes can cause public health hazards when released to the soil, groundwater, or air. The four basic exposure pathways through which an individual can be exposed to a chemical agent include: inhalation, ingestion, bodily contact, and injection. Exposure can come as a result of an accidental release during transportation, storage, or handling of hazardous materials. Disturbance of subsurface soil during construction can also lead to exposure of workers or the public from stockpiling, handling, or transportation of soils contaminated by hazardous materials from previous spills or leaks. Hazardous materials may also be present in building materials and released during building demolition activities.

SURROUNDING LAND USES

The Recology Hay Road (RHR) Property is located about 8 miles southeast of the City of Vacaville in Solano County, California. Land uses in the project vicinity consist primarily of agricultural and grazing lands. The nearest rural residence is located approximately 1 mile east. There are no schools within a 0.25-mile radius of the project site. Travis Air Force Base is located approximately four miles to the southwest.

Data on historic and documented releases of hazardous materials in the surrounding area were obtained through internet searches including review of the SWRCB GeoTracker database, the EPA Envirofacts/ Enviromapper website, and the state Cortese list via the DTSC EnviroStor database. Geotracker database indicates that the nearest cleanup site to RHR Landfill is a formerly used defense site, Travis Air Force Base (AFB) NIKE Battery 10, located approximately 2.5 miles west of the RHR Property. This site is identified as a Hazardous, Toxic, and Radioactive Waste (HTRW) site (T10000011789) and was used by the Department of Defense as an air defense missile battery from 1956 to 1974. The site cleanup status is listed as open for remediation since July 9, 2018 (SWRCB 2018).

LAND USES WITHIN THE PROJECT SITE

The RHR property has been in continuous operation as a landfill since 1964. The property contains a Class II and Class III solid waste disposal facility, as well as adjacent buffer and mitigation areas. Jepson Prairie Organics, a composting facility (SWFP No. 48-AA-0083), is co-located at the RHR Property, owned and operated by Recology, and is located

entirely within the footprint of a portion of the future Class II landfill disposal modules. The permitted footprint of the Jepson Prairie Organics facility is 54 acres and is permitted separately.

Geotracker database identifies 24 violations since 2014, 21 enforcement actions since 1998, and 57 inspections since 1992 (SWRCB 2019). Envirostor database identifies compliance evaluation inspections and enforcement actions from 2010 and 2017 related to lack of evidence that employees handling treated wood waste (TWW) have been trained in applicable Cal-OSHA rules, regulations, and orders relating to hazardous waste (DTSC 2019a). The project site is not included in DTSC's list of hazardous waste and substances sites. No open cleanup actions are indicated at the site at this time.

RHR Landfill is not included on the Inventory of Solid Waste Facilities Which Violate State Minimum Standards for solid waste handling and disposal (CalRecycle 2019). State minimum standards regulate the design and operation of solid waste facilities to protect public health and safety and the environment.

Existing Waste Classification and Management at RHR Landfill

The RHR Landfill currently accepts non-hazardous solid waste and recyclables, high liquid content waste, designated waste, Asbestos Containing Waste (ACW), TWW, and waste requiring special handling. Each of the waste types accepted for disposal at the site are discussed below (Golder 2018: Section 4 & 7).

Non-Hazardous Solid Waste and Recyclables

The landfill is a regional facility that accepts municipal solid waste (MSW) from Solano County and other northern California jurisdictions. Designated waste may be received from potentially more remote locations, depending on market factors. RHR Landfill recycles the following materials: curbside collected materials, wood, concrete and asphalt, clean and contaminated soil, ash, metals, tires, and dewatered sludge (a.k.a. biosolids).

High Liquid Content Waste

The landfill currently accepts dewatered sewage sludge (a.k.a. biosolids) from publicly- operated treatment plants. The landfill accepts non-hazardous dewatered or water-treatment sludge (a.k.a. biosolids) from these plants on a case-by-case basis. Industrial and food processing plant sludges are accepted and processed at the JPO facility. RHR Landfill currently accepts sludge (a.k.a. biosolids) if the sludge is primary sludge containing at least 20 percent solids if primary sludge or secondary sludge or a mixture of primary and secondary sludge containing at least 15 percent solids. The co-disposal ratio of dry refuse to sludge may not be less than 5:1 by weight unless otherwise approved by the RWQCB, per Title 27 Section 20220. Sludge (a.k.a. biosolids) is also recycled onsite in construction or cover applications. When used as cover, RHR is required to comply with Title 27, Section 20690.

Designated Wastes

Designated waste is considered waste that meets either of the following conditions as defined in the California Water Code section 13173:

- Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to Section 25143 of the Health and Safety Code.
- ► Non-hazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or that could reasonably be expected to affect beneficial uses of the waters of the state as contained in the appropriate state water quality control plan.

Designated wastes accepted at RHR include, but are not limited to, contaminated soil, industrial sludge (a.k.a. biosolids), dredge debris, slab/construction/demolition debris, commercial/industrial waste, and glass cullet. Designated wastes are managed, reused, and disposed of as required by Waste Discharge Requirement Order No. R5-2016- 0056 (see Section 4.9, "Hydrology and Water Quality," for more information related to waste discharge requirements at the site). The actual amount of designated waste received at the site is highly variable, depending on regional remediation activity, development of new industries generating designated wastes, and the regional economy.

Asbestos Containing Waste

ACW is accepted for disposal at RHR. Up to 2,500 tons per month of friable hazardous asbestos may be received at RHR Landfill and disposal is limited to DM-1. Waste containing greater than 1% friable asbestos (ACW) is managed consistent with Section 25143.7 of the Health and Safety Code and Title 14, Section 17897 et. seq. Non-friable asbestos is considered non- hazardous and may be disposed of at the landfill with other MSW, or if inert, may be disposed of in DM-1. The disposal procedure for asbestos, as defined in Title 14, Section 17897, is in compliance with all applicable federal and state laws and regulations and is summarized in the landfill's Asbestos Containing Waste Handling Procedures Manual (Golder 2018: Appendix G), The manual provides a set of working guidelines to ensure safe and proper management of ACW disposal at RHR Landfill and addresses required acceptance policy, operation procedures, employee training, personal protective equipment, employee medical evaluation, hazard communication, contingency plan/emergency response, and applicable regulations.

Treated Wood Waste

TWW may include but is not limited to waste wood that has been treated with chromated copper arsenate, pentachlorophenol, creosote, acid copper chromate, ammoniacal copper arsenate, ammoniacal copper zinc arsenate, or chromated zinc chloride for purposes of protecting the wood against insects, microorganisms, fungi, and other environmental conditions. TWW is accepted at the landfill and disposal is limited to the Class II composite lined modules of LF-3 and LF-4 in accordance with Title 22, Section 67386.11(a). Acceptance of TWW in either the LF-1 or LF-2 disposal modules is prohibited, and TWW cannot be recycled in the green waste processing area of the site, consistent with the handling prohibitions in Title 22 Section 67386.3.

Other Wastes Requiring Special Handling

Other wastes requiring special handling include empty triple-rinsed pesticide containers, large dead animals, agricultural wastes, tires, and ash. Recyclables received at the facility and that are diverted from disposal include but are not limited to metal and white goods, freon-containing appliances, tires, wood debris, and concrete.

Landfill Gas

Decomposition of wastes at the landfill produces gases including methane, which can accumulate and seep out of disposal areas. If methane enters confined spaces such as buildings, it can accumulate to explosive concentrations and present a significant safety hazard. To minimize potential risks, the migration of methane gas produced by the anaerobic decomposition of refuse is controlled by the onsite active LFG collection system. The natural, clayey soils of the landfill site and the perimeter liner system containing the waste also serve to control LFG migration. Lateral migration through the liner is minimized because of its resistance to gas flow. In addition, possible negative impacts from gas migration are minimized by the absence of nearby offsite structures and routine quarterly monitoring for the presence of methane inside structures located at the facility. A landfill gas controls operation and maintenance plan dated March 14, 2017 has been implemented at the RHR Landfill and is consistent with Title 27, Section 20921.

LFG at the landfill is regulated by the Yolo Solano Air Quality Management District under the site's Title V permit and by the RWQCB under the site's WDRs. To verify the effectiveness of the LFG management system, each LFG monitoring probe, pan lysimeter, and leak detection sump are monitored for methane, carbon dioxide, oxygen, and organic vapors as specified in the landfill's Monitoring and Reporting Program (MRP) Order No. R5-2016-0056 (Golder 2018: Appendix A). 18 LFG perimeter monitoring probes at 16 locations through the RHR property are monitored to maintain compliance with CalRecycle regulations. The LFG monitoring network was approved by CalRecycle and the Solano County Department of Resource Management, Environmental Health Division.

Vector Control

Rodents, certain birds, and insects are often attracted to wastes at landfill sites and can pose a safety risk. Vector problems are prevented at the landfill by proper site grading to eliminate ponded water (mosquito eating fish have been introduced into the perimeter dewatering ditch) and prompt placement of daily and intermediate cover of waste materials. Parasitic wasps are used to supplement fly mitigation by consuming fly larvae in the compost and biosolids storage and drying areas. A licensed falconer is used to help control the bird population at the site,

especially in winter months. A bubble machine may also be utilized to control the bird population around the site, as well as the utilization of other measures or technology as they become available to make the environment undesirable to birds. Vector control for the composting operations is discussed in the Report of Compost Site Information. If vectors become a problem in the biosolids stockpile area, the following management techniques are used at the landfill:

- Other bulking agents, such as wood chips, compost overscovers or soil can be mixed with high liquid content biosolids in the stockpiling area.
- During periods of no rain, the biosolids can be spread and dried. This drying process will be facilitated with disking or other turning equipment.

PROXIMITY TO AIRPORTS

Travis Air Force Base

The project site is located 3.3 miles southwest of Travis AFB. According to the Travis AFB Land Use Compatibility Plan (LUCP), the landfill falls within the outer perimeter of the Travis AFB Wildlife Hazard Analysis Boundaries. In addition, the landfill falls within Compatibility Zone C of the LUCP, which includes areas occasionally affected by concentrated numbers of low-altitude aircraft overflights (USAF 2015: Figure 4). Development review under the LUCP is the responsibility of the Solano County Airport Land Use Commission (ALUC). The ALUC establishes policies and guidelines to protect the safety and general welfare of the people in the vicinity of Travis AFB and ensures the safety of air navigation. To protect the public health, safety, and general welfare of persons surrounding Travis AFB, the ALUC is intended to guide, control and regulate future land use planning and development; promote compatible and appropriate land uses; and prevent the encroachment of incompatible land uses that would impair the ability of Travis AFB to fulfill its mission.

Compatibility Zone C encompasses additional areas occasionally affected by concentrated numbers of low-altitude aircraft overflights. This Compatibility Zones require land uses to be compatible with Travis AFB noise, visual, physical height, and electrical interference requirements (ALUC 2002). In particular, land uses that may cause the attraction of birds to increase are prohibited.

Aircraft Safety Hazards

Potential safety hazards for aircraft using Travis AFB pertain to the potential to attract birds, which may increase wildlife strikes and the use of lighting, which can be confused with landing zones by aircraft pilots. Potential bird hazards to aircraft using Travis AFB are controlled consistent with Land Use Permit (LUP) U-11-09 by the following measures:

- ► The size of the working face of the landfill during the wet season (October 15 to April 15) is limited to a maximum of 15,000 square feet (75 feet by 200 feet).
- ► The Selected landfill staff is trained on the Bird Gun Launcher Training Program. The use of blank cartridges (e.g. whistlers, screamer siren, and screechers), propane cannons for bird deterrents, and seasonal falconry is also utilized at the facility.

A monitoring program has been established to determine the effectiveness of the bird control program. A wildlife biologist has visited the site to establish the baseline conditions. The wildlife biologist documents results of the program on a quarterly basis and reports are provided to the Solano County Department of Resource Management and to Travis Air Force Base.

Lights from nighttime operations may affect aviation safety if facility lighting are confused with those of the runways at Travis AFB by incoming pilots. Existing Solano County LUP conditions require that all lighting be directed downward and shielded to prevent glare, and lighting may not be colored or placed in a pattern that may mimic an airstrip runway. Due to the proximity of Travis AFB and other smaller municipal and private airfields, Recology has

instituted a light control program at the landfill. As described below, the program requires that lights are used on the site only on the following occasions:

- At the public drop-off center if it becomes necessary to work after dark to process peak loads of recyclables.
- ► If the operator determines that it is necessary to work during the night during base liner preparation work (i.e., during the longer, drier summer days, nighttime), lights may be used for safety and efficiency. During the summer, daytime temperatures in the Central Valley may be too high for efficient Leachate Collection and Removal System (LCRS) placement over geomembrane. Lights may be used for this purpose each summer, from 10 p.m. to sunrise, for 1 to 2 months depending on the size of the portion being prepared that summer. RHR Landfill will have a portable light plant on site for this and other purposes. The operator has obtained a Solano County Airport Land Use Commission (ALUC) approval in 1993 for nighttime activities because the parcel on which the landfill is located is within the Travis AFB land use plan compatibility zone.
- ► Site personnel during nighttime operations of the landfill will operate onsite mobile lighting plants. The mobile lighting plants and collection truck vehicle lights will provide sufficient illumination of the landfill disposal areas to safely accommodate the nighttime deliveries of waste, as described above. Because of the site's proximity to Travis Air Force Base, the following special precautions will be taken before to commencement of nighttime lighting:
 - 1. All lighting will be shielded and pointed downward to prevent glare from interfering with nighttime operations at Travis.
 - 2. The placement of light will occur in an irregular pattern, so they do not mimic Travis air strip landing lights.
 - 3. Travis will be notified before commencement of nighttime lighting.

Low energy security lighting (ex., high-pressure sodium lights) is installed for the shop and office facilities.

WILDLAND FIRE HAZARDS

The California Department of Forestry and Fire Protection (CAL FIRE) maintains fire hazard severity zone maps for local and state responsibility areas. These areas are mapped based on fuels, terrain, weather, and other relevant factors. The project site is designated as a moderate fire hazard severity zone (CAL FIRE 2007). The Dixon Fire District is responsible for fire protection at the site (Golder 2018: 7-16).

Fire protection of landfill equipment and vehicles is provided by portable fire extinguishers located in the equipment and vehicles. The office, maintenance facility, and landfill equipment are equipped with fire extinguishers for extinguishing minor fires and for personnel safety. Site personnel are trained periodically by Recology corporate staff in the proper use of fire extinguishers. Landfill equipment and vehicle fire prevention is provided by frequent removal of oil and grease buildup, debris, and dust from under carriages and engine compartments. Primarily landfill personnel using soil cover stockpiles will extinguish any fire occurring on the landfill and, when necessary, a water truck (Golder 2018: 7-15, 7-16).

In addition, the following precautions are taken to reduce the risk of fire at the landfill (Golder 2018: 7-16).

- ► Flammable recyclable materials are separated to prevent fire.
- ► A ten foot fire break is provided around the perimeter of the active landfill area and areas used for the storage of compostable material, recyclables, and any combustible materials before their use.
- RHR staff is required immediately notify the County Local Enforcement Agency (LEA) if unusual amounts of settlement or venting of smoke occurs.
- ► RHR staff is required to report fire incidents to the County LEA within 24 hours of discovery.

In addition, the Emergency Response Plan /Hazardous Materials Business Plan (ERP/HMBP) for the RHR Landfill provides evacuation procedures in response to a fire.

HAZARDOUS MATERIALS TRAINING PLAN

The RHR Hazardous Materials Training Plan (2018a) is used by both the Health and Safety and Environmental Compliance departments of RHR to ensure employee safety and regulatory compliance with regard to hazardous materials. It is also designed to fulfill the Hazardous Materials Business Plan training requirements set forth by Title 19 Section 2732 of the California Code of Regulations. The plan is filed with the Solano County Hazardous Materials Division and is reviewed and amended as necessary. According to the Hazardous Materials Training Plan (2018a), the following training topics are typically taught by qualified Recology personnel.

- Bloodborne Pathogens
- Hazard Communication
- Personal Protective Equipment
- Confined Space Entry (if applicable)
- Hazardous Energy Control (Lock out/ Tag out)
- ► Fire Extinguishing Training
- ► Spill Response
- ► Emergency Response Plan Awareness / Evacuation Routes
- Emergency Notifications
- ► Hazardous Materials Storage Procedures
- ► Asbestos Awareness /Hazardous Waste Manifests / Respirator Training
- ► Spill Prevention Control and Countermeasure Plan
- ► Traffic Control / Heat Stress

The following training courses are typically taught by outside contractors.

- ► First Aid & CPR
- ► 24 Hour HAZWOPER
- ► 8 Hour HAZWOPER Refresher
- ▶ 8 Hour D.O.T. HM-181 Hazardous Materials Transportation
- ► 8 Hour D.O.T. HM-181 Refresher (Every 3 Years)
- ▶ 8 Hour Load checking

All employees that handle or have potential exposure to hazardous materials have been trained in the contents and procedures outlined in the RHR Hazardous Materials Business Plan (2018a). Refresher training occurs annually, and as needed.

EMERGENCY RESPONSE PLAN / CONTINGENCY PLAN HAZARDOUS MATERIALS BUSINESS PLAN

The RHR Emergency Response Plan/Contingency Plan Hazardous Materials Business Plan (ERP/HMBP) (RHR 2018b) describes processes in which hazardous materials are used, hazardous and other prohibited waste generation, and emergency response information. Specific detail is provided to address emergency procedures, including evacuation plans, emergency response training, and post-incident reporting/recording All employees that handle or have potential exposure to hazardous materials have been trained in the contents and procedures outlined in the RHR ERP/HMBP and all employees are trained in the response evacuation procedures (RHR 2018b).

4.8.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Based on Appendix G of the State CEQA Guidelines, the project could have a significant adverse effect related to public health and safety if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- result in a safety hazard or excessive noise for people residing or working in the project area for those projects located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport;
- impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

METHODOLOGY

Methods for the impact analysis provided below included a review of applicable laws, permits, and legal requirements pertaining to public health and safety and hazardous materials, as applicable to the project and the project site. Within this framework, existing onsite chemicals and chemicals usage, hazardous materials, fire potential, and potential for other safety or hazardous conditions were reviewed based on information available from staff of the existing facility, publicly available hazard and hazardous materials information, site/location and cleanup status information, and other available information. The impact analysis considered the potential for changes in the nature or extent of hazardous conditions to occur as a result of project construction and operation, including increased potential for exposure to hazardous materials and hazardous conditions. The potential for hazards and hazardous conditions were reviewed in light of existing hazardous materials management plans and policies, emergency response plans, fire management plans, and applicable regulatory requirements. As noted previously, impacts related to hazardous emissions (i.e., toxic air contaminants) are evaluated in Section 4.2, "Air Quality," and potential effects of hazardous materials on water quality are discussed in Section 4.8, "Hydrology and Water Quality," of this Subsequent Environmental Impact Report (SEIR).

ISSUES NOT DISCUSSED FURTHER

The project site is not located within 0.25 mile of a school. The nearest school to the project site is Scandia Elementary School, which is approximately 6 miles southwest of the site. Therefore, no impact related to schools would occur. This issue is not discussed further in this SEIR.

The proposed project would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (i.e. Cortese List) and, as a result, would not create a significant hazard to the public or the environment (DTSC 2019b). Therefore, this issue is not discussed further in this SEIR.

The ERP/HMBP describes processes in which hazardous materials are used, hazardous and other prohibited waste generation, and emergency response information. Specific detail is provided to address emergency procedures, including evacuation plans, emergency response training, and post-incident reporting/recording Post-project operations would be substantially similar to existing operations and no element of the project would impair implementation of or physically interfere with any adopted emergency plan. Additionally, the project is not expected to generate large amounts of traffic (see Section 4.11, "Traffic and Transportation") and would not involve the modification of existing roadway alignments, such that nearby evacuation routes would be affected. Therefore, project implementation would not interfere with any adopted emergency response plans, and no impact would occur. This issue is not discussed further in this SEIR.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.8-1: Exposure of People and the Environment to Hazardous Materials

Operation of a landfill inherently involves the storage, use, and transport of hazardous materials; however, systems are in place at the RHR facility that are compliant with federal, state, and local laws to allow such handling in a way that is protective of people and the environment. No aspect of the proposed project would substantially change operations such that new or revised systems or procedures would be required. Hazardous materials would continue to be managed with existing controls in place and in accordance with all applicable laws, including Title 27 of the CCR, as it is currently. Implementation of the project would extend the disposal area laterally, deepen and widen an existing onsite borrow pit, allow for friable asbestos disposal within additional areas of the landfill, and allow for an increase in the existing daily peak tonnage limit. However, operations related to the storage, use, and transport of hazardous materials would remain the same as under existing conditions. Thus, the project would operate in accordance with all federal, state, and local regulations pertaining to the use, storage, and transport of hazardous materials. This impact would be **less than significant**.

Implementation of the project would include lateral expansion of the landfill disposal area; deepening and widening of the existing borrow pit, disposal of friable asbestos within additional areas of the landfill, and amending the LUP to increase the peak day limit to 3,400 tons per day (tpd) of MSW with a 7-day-average limit of 3,200 tpd of disposal; and. While the landfill could accept a greater quantity of waste, on a daily basis and throughout its lifetime, no new types of wastes would be accepted and no changes to disposal practices are proposed. All allowable uses would continue to be subject to compliance with federal, state, and local hazardous materials regulations, and would be monitored by the state (e.g., Cal/OSHA and DTSC). Therefore, it is not anticipated that the routine use of materials handled in accordance with these laws and regulations would create a substantial hazard to the public or the environment.

Hazardous materials may be unknowingly accepted through illegal disposal practices. However, waste disposed at the landfill is monitored closely and controlled to minimize the likelihood of this occurring, and the potential for illegal disposal of hazardous materials is not expected to increase with the proposed project. Therefore, potential exposure of people and the environment to hazardous materials as a result of illegal disposal practices is low.

The landfill is permitted for acceptance of non-hazardous solid waste, high-liquid-content waste, wastewater treatment plant sludge, designated waste, asbestos-containing waste, and waste requiring special handling, as defined by the State. These materials are handled and disposed of in accordance with federal, state, and local regulations. Although the onsite location for friable asbestos disposal would change with project implementation, no modification of the monthly tonnage limit on friable asbestos disposal would occur. Implementation of the proposed project would not result in any changes to the existing list of wastes permitted at the landfill or how they are currently handled and disposed.

Overall, the project would not create a significant hazard to people or the environment through the routine transport use, or disposal of hazardous materials, nor would it create a significant hazard through reasonably foreseeable upset involving the likely release of hazardous materials into the environment because comprehensive regulations and plans are in place, are currently followed for the existing landfill operations, and would continue to be implemented for the proposed project to prevent the release of hazardous materials onsite. This would be a **less-than-significant** impact.

Mitigation Measures

No mitigation measures are required.

Impact 4.8-2: Exposure of People and the Environment to Hazards Related to LFG

Expansion of the landfill could result in the production of additional LFG that could expose people or the environment to safety hazards. However, a third LFG flare is proposed as part of this project to ensure a total capacity of 6,000cubic feet per minute (cfm) at the landfill for safe and adequate control of LFG with landfill expansion. LFG would continue to be monitored at the project site and the LFG collection and the monitoring system would be expanded to accommodate the increased production of LFG. Therefore, this impact would be **less than significant**.

With the proposed landfill expansion and increased volume of waste disposal proposed under the LUP modification, the landfill is anticipated to produce a maximum of 4,651 cfm at 50% methane. To ensure LFG standards established in Title 27 of the CCR would not be exceeded, an additional enclosed LFG flare is proposed as part of this project with a capacity of 45 MM (million) BTU (British thermal unit)/hour (1500 cfm at 50% methane) to ensure a total capacity of 6,000 cfm at the landfill for safe and adequate control of LFG. Through adherence to Title 27 requirements and the addition of an additional LFG flare, the potential for exposure of people or the environment to hazards related to LFG would not be substantial.

Because LFG produced by the RHR Landfill is currently being monitored and remediated, and the proposed project includes the expansion of the existing system to contain LFG migration within the boundaries of the project site and away from existing populations and structures, the generation of additional LFG as a result of the proposed project would not pose an increased hazard to people or the environment. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are required.

Impact 4.8-3: Potential Hazards Associated with Vectors

Vector control measures that are currently in place are effective and would continue to be implemented. In addition, there no proposed expansions of onsite water-related facilities; therefore, the proposed project would not increase the amount of standing water that could attract mosquitoes. Any vector control issues associated with proposed storage of baled recyclables would be addressed with implementation of the vector control measures described in the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018. Therefore, this impact would be **less than significant**.

Waste materials at landfills have the potential to attract and create habitat for vectors, and standing water, including detention basins and drainages, can provide breeding habitat for mosquitoes. Vectors could pose a substantial hazard if pathogens or other diseases carried by vectors were to infect workers or be transported offsite to persons or animals. The project would laterally expand the landfill into the Triangle area, thereby increasing the potential to attract vectors. However, vector control measures currently implemented at the landfill, as described above in Section 4.8.2, "Environmental Setting," have been effective and would continue to be implemented. These include: daily covering of the active disposal area, parasitic wasps, and properly grading to prevent standing water to reduce the potential for mosquito habitat. Vector control measures would continue to comply with Title 27 of the CCR. As with the existing landfill, the expanded portion of the landfill would be managed to minimize vector habitat. A segment of an existing drainage ditch in the Triangle area would be realigned as part of the project; however, the project would not result in an increase to the amount of standing water onsite. Therefore, proposed expansion of the landfill would not substantially increase the potential to attract vectors to the RHR facility.

The proposed baled recyclable storage at the site has low potential to attract vectors as vectors are typically associated with stagnant water ponding. The bales would be stored on pallets and covered with tarps to limit harboring of vectors. In addition, the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018 requires implementation of vector prevention measures. These measures are described in

Chapter 3, Project Description, of this SEIR and in the RHR Recyclable Material Bale Management Operations Plan (see Appendix B of this SEIR).

Because the proposed project would not result in an increase in vector habitat and the landfill would continue to be managed to minimize the potential for vectors, this impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

Impact 4.8-4: Potential Hazards Associated with Proximity to Airports

The RHR Landfill is located approximately four miles northeast of the landfill and within the Travis AFB Land Use Compatibility Plan Zones C and B2. Potential safety hazards for aircraft using Travis AFB pertain to the landfill's potential to attract birds, which may increase wildlife strikes, and the use of lighting, which can be confused with landing zones by aircraft pilots. No new sources of fixed lighting are proposed and portable lighting to be used onsite would be consistent with the landfill's light control program and limited to base liner preparation work, as needed, during construction of the landfill expansion area and. The landfill maintains a bird control program and facility lighting standards, both of which minimize potential adverse hazards on aircraft. This impact would be **less than significant**.

As noted above, the RHR Landfill is located within the Travis AFB Land Use Compatibility Plan Zones C and B2 and is required to implement programs at the landfill address potential hazards related to the potential for bird strikes and lighting. Any changes to the landfill require an assessment of the potential for increased risk of wildlife strikes as a result of continued aircraft operations at Travis AFB.

In April 2018, a Wildlife Hazard Analysis report was prepared by SWCA Environmental Consultants (2018) to determine whether the proposed project would potentially create new or exacerbate existing wildlife hazards to aircraft in the area (see Appendix I of this SEIR). The landfill's existing bird control program is monitored and documented quarterly to ensure that it effectively reduces the potential for bird strikes associated with Travis AFB. Based on existing strike data, less than 5% of the documented bird strikes at Travis AFB have been attributed to species that routinely forage at the landfill. The 2018 Wildlife Hazard Analysis determined that the proposed project would modify existing wildlife attractants (i.e., extend landfill within Triangle area and relocation of drainage ditch segment) but would not add new wildlife attractants to the landfill. Because the landfill's existing bird control program would be extended to the proposed project elements and would not result in a larger active landfill face or increase foraging opportunities for wildlife, it is unlikely that project implementation would create new wildlife hazards for Travis AFB aircraft (SWCA 2018: 12-13).

In addition to the potential for bird strikes to create safety issues at Travis AFB, lights from nighttime landfill operations may affect aviation safety if facility lighting is confused with those of the runways at Travis AFB by incoming pilots. As described in Section 4.8.2, "Environmental Setting," the landfill's existing light control program allows for fixed and portable lighting units to illuminate portions of the site during nighttime operations. The landfill's light control program limits onsite lighting considerably and is consistent with Policy RS.P-36 of the Solano County General Plan (2008: p. RS-37). No new sources of fixed lighting are proposed. The landfill's existing light control program allows portable nighttime lighting for specific occasions. During construction of the landfill expansion area, use of portable nighttime lighting may be needed on occasion for base liner preparation work and would be consistent with the landfill's existing lighting.

Because existing bird control programs and lighting standards would continue to be implemented during construction and operation of the proposed project, aircraft safety hazards would be minimized and this impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

Impact 4.8-5: Increased Potential for Wildland Fires

The project site is located in an area classified as a moderate fire hazard severity zone. However, extensive fire control measures are currently, and would continue to be, implemented at the project site to reduce the potential risk for fires. Thus, this impact would be **less than significant**.

Operations at landfills have the potential to result in fires through inadvertent disposal of hot loads or combustion of composting materials. If not controlled, fires could spread to nearby properties. The project site is not located in or near state responsibility areas (Solano 2008: HS-49) but is located in an area classified as a moderate fire hazard severity zone (CAL FIRE 2007). However, as described above, extensive fire control measures are implemented onsite as part of the ongoing operations of the landfill and have been effective at minimizing fire risks. These measures include fire extinguishers located in landfill vehicles and facilities, frequent removal of oil and grease buildup, debris, and dust from under carriages and engine compartments of landfill vehicles and equipment, use of soil cover stockpiles or a water truck to extinguish any fire occurring on the landfill, maintaining fire breaks around the property, and separation of flammable recyclable materials (Golder 2018: 7-15, 7-16). Recology also maintains and implements an emergency response plan that includes procedures and requirements for responding to potential fires, including facility fires and wildfires at the project site. Lateral expansion of the disposal area and other onsite changes to the LUP would not increase the potential for fires to occur because existing fire suppression and prevention measures would continue to be implemented and the landfill would remain under the responsibility of the Dixon Fire District. Therefore, implementation of the project would not substantially increase the risk for wildland fires at the RHR facility or in the surrounding area. This impact would be **less than significant**.

Mitigation Measures

No mitigation measures are necessary.

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4.9 HYDROLOGY AND WATER QUALITY

This section describes the existing hydrological setting for the project site, including runoff, storm drainage, and flood control. Regulations and policies affecting local hydrology and water quality are discussed, and impacts that may result from project implementation, including those related to soil erosion, water quality, and groundwater, are identified.

Comments from Central Valley RWQCB (RWQCB) providing an overview of regulatory requirements related to quality of surface and groundwater were received in response to the Notice of Preparation for the proposed project.

4.9.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

Clean Water Act (Public Law 92-500)

Section 404

The Clean Water Act (CWA) consists of the Federal Water Pollution Control Act of 1972 and subsequent amendments. The CWA provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. Section 404 of the act prohibits the discharge of fill material into waters of the United States, including wetlands, except as permitted under separate regulations by the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency (EPA). Potential affects related to wetlands are discussed in Section 4.4, "Biological Resources."

Section 401

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification for the discharge. The certification must be obtained from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over the affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. Water quality certification requires evaluation of potential impacts in light of water quality standards and CWA Section 404 criteria governing discharge of dredged and fill materials into waters of the United States. The federal government delegates water pollution control authority under CWA Section 401 to the states (and in California, ultimately to the regional water quality control boards [RWQCBs]).

Section 402

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate discharges of pollutants into waters of the United States. An NPDES permit sets specific discharge limits for point sources discharging pollutants into waters of the United States and establishes monitoring and reporting requirements, as well as special conditions. Two types of nonpoint source discharge are controlled by the NPDES program: discharges caused by general construction activities and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the maximum extent practicable. The RWQCBs in California are responsible for implementing the NPDES permit system (see the discussion of state regulations below).

Federal Emergency Management Agency

In 1968, Congress created the National Flood Insurance Program in response to the rising cost of taxpayer funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program to provide subsidized flood

insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA also issues flood insurance rate maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA has established a minimum level of flood protection for new development as the 1-in-100 Annual Exceedance Probability (i.e., 100-year flood event).

Federal Antidegradation Policy

The federal antidegradation policy, established in 1968, is designed to protect existing uses and water quality and national water resources. The federal policy directs states to adopt a statewide policy that includes the following primary provisions:

- existing in-stream uses and the water quality necessary to protect those uses shall be maintained and protected;
- where existing water quality is better than necessary to support fishing and swimming conditions, that quality shall be maintained and protected unless the state finds that allowing lower water quality is necessary for important local economic or social development; and
- where high-quality waters constitute an outstanding national resource, such as waters of national and state parks, wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

Water Quality Criteria/Standards

Pursuant to federal law, EPA has published water quality regulations under Title 40 of the Code of Federal Regulations (CFR). Section 303 of the CWA requires states to adopt water quality standards for all surface waters of the United States. As defined by the act, water quality standards consist of designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires EPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. Where multiple uses exist, water quality standards must protect the most sensitive use. As described in the discussion of state regulations below, State Water Resources Control Board (SWRCB) and its nine RWQCBs have designated authority in California to identify beneficial uses and adopt applicable water quality objectives.

National Toxics Rule and California Toxics Rule

In 1992, EPA issued the National Toxics Rule (NTR) (40 CFR 131.36) under the CWA to establish numeric criteria for priority toxic pollutants in 14 states and jurisdictions, including California, to protect human health and aquatic life. The NTR established water quality standards for 42 pollutants for which water quality criteria exist under CWA Section 304(a) but for which the respective states had not adopted adequate numeric criteria. EPA issued the California Toxics Rule (CTR) in May 2000. The CTR establishes numeric water quality criteria for 130 priority pollutants for which EPA has issued Section 304(a) numeric criteria that were not included in the NTR.

STATE PLANS, POLICIES, AND REGULATIONS

State Water Resources Control Board

In California, the SWRCB has broad authority over water quality control issues for the state. The SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the state by the federal government under the CWA. Other state agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) (for drinking water regulations), the California Department of Pesticide Regulation, the California Department of Fish and Wildlife, and the Office of Environmental Health and Hazard Assessment. Regional authority for planning, permitting, and enforcement is delegated to the nine regional water boards. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. The Central Valley RWQCB is responsible for water resources in the project vicinity.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) is California's statutory authority for the protection of water quality. The act sets forth the obligations of the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires waste dischargers to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, NPDES permits, Section 401 water quality certifications, or other approvals.

NPDES Permits

The SWRCB and Central Valley RWQCB have required specific NPDES permits for a variety of activities that have potential to discharge pollutants to waters of the state and adversely affect water quality. To receive an NPDES permit a Notice of Intent to discharge must be submitted to the Central Valley RWQCB and design and operational best management practices (BMPs) must be implemented to reduce the level of contaminated runoff. BMPs can include the development and implementation of regulatory measures (drainage facility design in accordance with local authority requirements); educational measures (public workshops), public policy measures (labeling of storm drain inlets), and structural measures (filter strips, grass swales, and retention basins). All NPDES permits also have inspection, monitoring, and reporting requirements.

General Permit for Stormwater Discharges Associated with Construction Activity

The SWRCB adopted the statewide NPDES General Construction Permit in August 1999. The state requires that projects disturbing more than 1 acre of land during construction file a Notice of Intent with the RWQCB to be covered under this permit. Construction activities subject to the General Construction Permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters. A stormwater pollution prevention plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include BMPs designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving offsite into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

The Recology Hay Road (RHR) Landfill has a SWPPP that was review and approved by the RWQCB for the site. The SWPPP was prepared consistent with the NPDES General Permit for Storm Water Discharges Associated with Industrial Activities, NPDES No. CAS000001, California State Water Resources Control Board Water Quality Order No. 2016-0056-DWQ.

State Nondegradation Policy

In 1968, the SWRCB adopted a nondegradation policy aimed at maintaining high quality for waters in California. The nondegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy provides as follows:

- a) Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.
- b) Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements.

Safe Drinking Water Act

As mandated by the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to domestic water supply. Such contaminants are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA primary and secondary maximum contaminant levels (MCLs). MCLs and the process for setting these standards are reviewed

triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting drinking water MCLs. EPA has delegated to the DHS the responsibility for California's drinking water program. DHS is accountable to EPA for program implementation and for adoption of standards and regulations that are at least as stringent as those developed by EPA. Title 22 of the California Administrative Code (Article 16, Section 64449) defines secondary drinking water standards, which are established primarily for reasons of consumer acceptance (i.e., taste) rather than for health issues.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act (SGMA). SGMA requires medium- and high-priority groundwater basins in the state to be managed by local agencies that have formed a Groundwater Sustainability Agency (GSA) by June 30, 2017. Once formed, a GSA must develop and implement a Groundwater Sustainability Plan (GSP) by January 31, 2022 to guide the sustainabile management of its groundwater basin. The GSA then has 20 years following this date to achieve its sustainability goals. In Solano County, the state has designated the Solano Subbasin as medium-priority, and thus subject to SGMA. The project site is within the boundaries of the Solano GSA, an 11-members joint powers authority formed in 2017. Other GSAs within the Solano Subbasin include the Solano Irrigation District GSA, City of Vacaville GSA, Northern Delta GSA, and Sacramento County GSA. Together with the Solano GSA, these agencies are known as the Solano Collaborative. While each agency is responsible for its own public outreach and stakeholder communications, the group will work collaboratively to develop the GSP, which will be completed by January 31, 2022.

California Code of Regulations

14 California Code of Regulations Section 17407

Title 14 of the California Code of Regulations (CCR), Article 6.2 of Chapter 3 contains regulations of the California Integrated Waste Management Board pertaining to drainage from solid waste facilities. Section 17407 describes operating standards including drainage controls that must be implemented at solid waste facilities.

27 California Code of Regulations Section 20340

Title 27 of the CCR, Division 2, Solid Waste, provides criteria for all waste management units, facilities, and disposal sites. Section 20340 of Chapter 3 addresses Leachate Collection and Removal System (LCRS) requirements. LCRSs are required for Class II landfills and surface impoundments, and for Class III landfills that have a liner or that accept sewage or water treatment sludge. The LCRS shall be installed directly above underlying containment features for landfills and waste piles, and installed between the liners for surface impoundments. The LCRS shall consist of a permeable subdrain layer that covers the bottom of the unit and extends as far up the sides as possible (i.e., blanket type). The LCRS shall be of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the unit.

California Water Code

The California Water Code is enforced by the California Department of Water Resources (DWR). The mission of DWR is "to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments." DWR is responsible for promoting California's general welfare by ensuring beneficial water use and development statewide through implementation of the Water Code. The California Water Code includes provisions for water supply assessments; these are included in Water Code Section 10910-10915 and CEQA Guidelines Section 15155.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County General Plan

The Solano County General Plan contains the following goals and policies that are relevant to the analysis of potential hydrology and water quality impacts associated with the project:

- Resource Policy 64: Identify, promote, and seek funding for the evaluation and remediation of water resources or water quality problems through a watershed management approach. Work with the regional water quality control board, watershed-focused groups, and stakeholders in the collection, evaluation, and use of watershed-specific water resources information.
- ► Resource Policy 65: Require the protection of natural water courses.
- Resource Policy 66: Together with the Solano County Water Agency, monitor and manage the county's groundwater supplies.
- ► Resource Policy 67: Encourage new groundwater recharge opportunities.
- Resource Policy 68: Protect existing open spaces, natural habitat, floodplains, and wetland areas that serve as groundwater recharge areas.
- ► **Resource Policy 69:** Preserve and maintain watershed areas characterized by slope instability, undevelopable steep slopes, high soil erosion potential, and extreme fire hazards in agricultural use. Watershed areas lacking water and public services should also be kept in agricultural use.
- ► **Resource Policy 70:** Protect land surrounding valuable water sources, evaluate watersheds, and preserve open space lands to protect and improve groundwater quality, reduce polluted surface runoff, and minimize erosion.
- **Resource Policy 71:** Ensure that land use activities and development occur in a manner that minimizes the impact of earth disturbance, erosion, and surface runoff pollutants on water quality.
- Resource Policy 72: Preserve riparian vegetation along county waterways to maintain water quality.
- Resource Policy 73: Use watershed planning approaches to resolve water quality problems. Use a comprehensive stormwater management program to limit the quantity and increase the water quality of runoff flowing to the county's streams and rivers.
- Resource Policy 74: Identify naturally occurring and human-caused contaminants in groundwater in new development projects and develop methods to limit and control contaminants. Work with RWQCB to educate the public on evaluating the quality of groundwater.
- ► **Resource Policy 75:** Require and provide incentives for site plan elements (such as permeable pavement, swales, and filter strips) that limit runoff and increase infiltration and groundwater recharge.
- ► Resource Policy 76: Promote sustainable management and efficient use of agricultural water resources.

4.9.2 Environmental Setting

CLIMATE

The project site is located in a warm and temperate (Mediterranean) climate characterized by a distinctive seasonal precipitation regime. Summers are dry with little or no precipitation from June to September. The average daily-high temperature during summer months is 95°F and the average daily-low temperature is 53°F. The mean annual precipitation in the project vicinity for the period between 1947 and 2016, was approximately 17 inches. Most precipitation occurred from November through April. During the period of record, annual precipitation has varied from 9.7 inches (1953) to 25 inches (1970), with a one-day high of 3.2 inches on January 21, 1967. The average daily-high temperature during the winter months is 66°F and the average daily-low temperatures is 37°F (Western Climate Center 2012).

HYDROLOGY

Solano County contains two major drainage provinces: San Francisco Bay Province and Sacramento River Province. The project site is located within the Sacramento River Province. This area encompasses watersheds in the northern portion of Solano County that drain into the Sacramento Delta, including the Lower Putah Creek, Cache Slough, Ulatis Creek, Wooden Valley Creek-Frontal Suisun Bay Estuaried watersheds. The project site is located within the Ulatis Creek Watershed (as shown in Figure 4.9-1). The Ulatis Creek Flood Control Channel is the main drainage in this watershed, but the watershed also includes portions of the New Alamo Creek Flood Control Channel, Horse Creek, Gibson Canyon Creek, Sweany Creek, and McCune Creek. These creeks drain to Cache Slough, which outlets into the Sacramento River. The existing land use in the Ulatis Creek Watershed is largely agricultural; however, the watershed also contains the entire extent of the City of Vacaville. Storm runoff and irrigation tailwater drain through this creek system in an east- southeasterly direction, from the mountains of the Coast Range in the western portion of the watershed, towards the Sacramento River Delta.

Surface water drainage from the project site is conveyed by a series of manmade drainage structures: drainage channels and down drains on the disposal modules, drainage channels, and culverts conveying water away from the disposal modules, sedimentation basins, and the bird sanctuary pond. The Alamo Creek Flood Control Channel (A-1 Channel) runs along Hay Road north of the project site, and along SR-113, east of the project site. An additional drainage channel runs along the northern boundary of the project site and flows into the bird sanctuary pond northeast of the project site. A hydrological flow analysis of the project site concluded that drainage within the project site flows east- southeasterly towards the perimeter channel along the eastern boundary of the triangle, consistent with drainage of the overall watershed (ESA 2017).

A major hydrological feature within the region and the project site is vernal pool systems, including predominately northern claypan vernal pools and associated vernal pool-grassland matrix. Vernal pool habitat is found on level or gently undulating land with pools that are generally small, seasonal wetlands that form in shallow depressions. These depressions fill with rainwater and runoff from adjacent areas in the winter, and typically remain inundated throughout the spring to early summer. Vernal pools can vary in size from a few square meters to several hectares, and the larger pools are typically called playa pools. The project site contains vernal pool-grassland matrix habitat characterized by many small pools with relatively short hydroperiods, and a portion of a large, human-made playa pool. These sensitive habitats are described in more detail in Section 4.4, "Biological Resources."

Groundwater Hydrology

Regionally, the Sacramento Valley is a large, north-south trending basin filled with deep marine sediments overlain by shallow freshwater sediments that were eroded from the adjacent ranges to the west, north, and east. The Sacramento Valley Groundwater Basin includes the entire Sacramento Valley from Tehama County south to Solano County, including the project site, which is in the Yolo Subbasin (DWR 2013). The Yolo Subbasin is bounded on the east by the Sacramento River, on the west by the Coast Range, on the north by Cache Creek, and on the south by Putah Creek.

Groundwater in the Yolo Subbasin is generally classified as occurring in sedimentary continental deposits, including younger alluvium, older alluvium, and the Tehama Formation (DWR 2004). Groundwater within the older alluvium and Tehama formation is recharged primarily by percolation of rainfall and surface water in the region. The water table throughout the region is characterized by permeable units separated by fine-grain low-permeability strata; however, wells seasonally recover indicating that these permeable units have significant hydrological interconnection (Einarson 1995). Depth to groundwater in the site was reported at about 10 feet in 1950, and water wells in the vicinity of the project site have ranged from approximately 20 to 300 feet deep (Einarson 1995).



The depth to groundwater measured in site groundwater monitoring wells varies across most of the site from about 5 to 36 feet below ground surface (i.e., elevation 2 to 22 feet NGVD 29). Currently, the landfill conducts dewatering activities at the existing borrow pit, in order to extract soil material for landfill cover within the disposal modules. Dewatering of the soil borrow pit is completed by pumping water from the south end of the pit to a drainage swale that drains along the southern perimeter of the permitted landfill footprint to the Bird Sanctuary Pond. Pumping is completed as necessary to manage the water levels in the soil borrow pit (Golder Associates: 2018 5-10). Dewatering operations are conducted consistent with Regional Board Order No. R5-2013-0073-01, NPDES No. CAG995002, Waste Discharge Requirements for Limited Threat Discharge of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water (Golder Associates 2018: 3-9). The extracted groundwater is then either redistributed into an unused part of the borrow pit or used for dust control purposes elsewhere within the landfill disposal area. Dewatering of the borrow pit, as part of existing landfill operations, has altered the movement of shallow groundwater beneath the western half of the site, where the groundwater flow direction has been changed to flow toward the west to the borrow pit, rather than the natural southeasterly flow direction. Groundwater elevations also vary seasonally about 1 to 5 feet and in response to water level changes in surface recharge areas (Golder Associates 2018: 3-7).

Floodplains

The 100-year flood refers to the flood resulting from a storm event that has a probability of occurring once every 100 years, or a 1 percent chance of occurring in any given year. Areas mapped in the 100-year floodplain area are subject to inundation during a 100-year storm event. Approximately 80 percent of the project site, including the entirety of the Triangle, is within the 100-year floodplain (refer to Figure 4.9-2). No portion of the project site is within the 200-year floodplain.

WATER QUALITY

Water quality refers to the chemical and physical properties of water, which affects the uses and users of that water. Ulatis Creek, which is located approximately 1.5 miles east of the project site, has been classified by the SWRCB as an "impaired water" due to levels of diazinon and chlorpyrifos, which are organophosphorus insecticides originating from agricultural and urban runoff (SWRCB 2016). It is likely that other surface waters on the project site may also contain these pollutants due to the extensive agricultural use surrounding the project site. The Former Alamo Creek and A-1 Channel, which flowed across the eastern portion of the landfill and contained mostly agricultural drainage water, is known to have elevated concentrations of nitrate. Agricultural drainage water may have been a source of nitrates along the former channel alignment and may be a current source of nitrates along the current alignment.

Leachate is formed in landfills by percolation of water into and through the refuse mass. Because this liquid includes dissolved and insoluble chemicals, leachate is collected and removed to prevent localized degradation of water quality. The RHR Landfill has a liner system and LCRS that has been approved by the Central Valley RWQCB. These systems are described in more detail in Section 3, "Project Description."

Drainage ditches, berms, culverts and down drains provide surface water control at the project site and are sized to accommodate various design storm events, as required by Title 27, Section 20365 (Golder 2018: 5-9).

The landfill's water quality monitoring program is designed to meet regulatory requirements as specified in Title 27, Section 20415 and the facility's Waste Discharge Requirements (WDRs) under Regional Board Order No. R5-2016-0056 (Golder Associates 2018: 6-2). Dewatering operations at the borrow pit are conducted consistent with Regional Board Order No. R5-2013-0073-01, and NPDES No. CAG995002, Waste Discharge Requirements for Limited Threat Discharge of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water.



ASCENT

As noted above, State and federal regulations require landfills to implement a water quality monitoring program to enable early detection of a release from the landfill that could affect groundwater quality. Title 27, Section 20385 defines three components of the monitoring program: (1) detection monitoring; (2) evaluation monitoring; and (3) corrective action. Groundwater monitoring has been conducted at the site since 1986 and Recology is currently conducting required detection, evaluation monitoring, and corrective action monitoring (Golder 2018:6-1).

The RHR Landfill groundwater monitoring system meets the requirements of Title 27. Monitoring Plans are prepared for each disposal module and submitted to the Regional Board for review and approval prior to operation of a disposal module. The monitoring plans are prepared in compliance with Title 27 and propose groundwater monitoring wells at the points of compliance that allow for the detection of a release from the landfill units. Where possible, detection groundwater monitoring wells are located directly downgradient from individual disposal module leachate sumps. The leachate sumps are targeted specifically for monitoring because these are the locations where the greatest thickness of leachate can accumulate and the area of the disposal module that is closest to groundwater. Based on the information provided above, including Title 27 regulations, past Regional Board involvement and approval of the existing monitoring network, the local hydrogeologic characteristics and basic hydrogeologic principles, Recology is monitoring the uppermost aquifer, as defined in Title 27 (Golder 2018:6-1). Changes to the groundwater monitoring system have been made gradually over time as the landfill has been developed. These changes have been documented and approved, when necessary, through correspondence with the RWQCB, as well as through annual monitoring reports submitted to the RWQCB.

An evaluation-monitoring program (EMP) may be required, pursuant to Title 27, Section 20425 to evaluate evidence of release if detection monitoring and/or verification procedures indicate evidence of a release. Recology notifies and submits a semi-annual and annual monitoring report to the RWQCB and local enforcement agency (LEA) summarizing sampling, monitoring, and corrective actions taken should a release occur. Currently, the wells in the EMP are various eastern area wells for manganese (Golder 2018:6-5).

A corrective action program to remediate impacts from a release of wastes from the landfill may be required, pursuant to Title 27, Section 20430 should results of any wells in the EMP warrant corrective action.

There are two disposal modules in corrective action for volatile organic compounds in pan lysimeters and nitrate in pan lysimeters and two areas with nitrate-impacted groundwater that are currently operating under a corrective action monitoring program (CAP) (Golder 2018:6-5). Water detected in the corrective action pan lysimeters (and other pan lysimeters, if present) is pumped into the adjacent, overlying leachate sump. To eliminate the possibility of potentially compromising the sumps' capacity by discharging and temporarily storing pan lysimeter liquid, the pan lysimeter liquids are immediately pumped from the sumps by manually over-riding the liquid level controls, thereby maintaining the capacity of the sumps to collect leachate. The volume of pan lysimeter liquids discharged into and pumped out of the LCRS sumps is recorded to confirm that the volumes are comparable. In addition, the liquid level in the pan lysimeter is checked after pumping and recorded to aid in identifying future discharges into the pan lysimeter. The pan lysimeter liquids are managed as leachate and are pumped directly to the leachate storage tank that is associated with that specific disposal module (Golder 2018:6-5).

The two areas of the landfill that are under a corrective action monitoring program for nitrate/nitrite as nitrogen detected in groundwater at concentrations greater than the concentration limit are in the western part of the landfill. These areas are currently undergoing remediation under the application of General Order R5- 2008-0149-056 "General Waste Discharge Requirements for In-situ Groundwater Remediation at Sites with Volatile Organic Compounds, Nitrogen Compounds, Perchlorate, Pesticides, Semi-volatile Organic Compounds and/or Petroleum Compounds". The progress of corrective action is monitored under Monitoring and Reporting Program No. R5-2008-0149-056. Six new groundwater monitoring wells were installed to provide treatment zone, transition zone, and compliance monitoring wells for the nitrate remediation under General Order R5-2008-0149-056. The groundwater remediation involved the injection of sodium lactate into the groundwater to reduce nitrate levels. The injection process was completed between March 17, 2015 and May 22, 2015, and the corrective action monitoring program was completed and approved by the RWQCB (Golder 2018:6-5).

WATER USE

There are 12 known water wells existing within 1 mile of the landfill. Groundwater in the area is primarily used for farm stock watering (Golder Associates 2018: 4-1). Use of water onsite is limited to dust control and washing/restroom uses at the RHR office. The RHR Landfill is not connected to a municipal water system and does not use potable water. The site maintains one 10,000-gallon water tank that is supplied by dewatering of the borrow pit and supplies RHR's two-4,000-gallon water trucks, which are used for dust control on all onsite roadways. The RHR office is supplied by non-potable well water, and employees are provided with bottled water for consumption. Water used for dust control is subsequently discharged to the Bird Sanctuary Pond, and then to the A-1 Channel (Golder Associates, 2018: 7-12, 7-16). In 2017, approximately 223 million gallons of groundwater were dewatered from the borrow pit (Recology Hay Road 2017).

4.9.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Based on Appendix G of the State CEQA Guidelines, the project would result in a potentially new significant impact, or substantial increase in a previously identified significant impact, related to hydrology and water quality if it would:

- violate any water quality standards or waste discharge requirements; or otherwise substantially degrade surface or groundwater quality;
- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - result in substantial erosion or siltation on- or offsite;
 - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
 - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
- ► In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

METHODOLOGY

Evaluation of potential hydrologic and water quality impacts was based on a review of existing information from previously completed documents that address water resources in the project vicinity. The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects, based on the standards of significance presented in this chapter. In determining the level of significance, the analysis assumes that the proposed project would comply with relevant federal, State, and local ordinances and regulations.

ISSUES NOT DISCUSSED FURTHER

Because of the distance from the nearest open waterbody, the Pacific Ocean (more than 62 miles west of the project site), the proposed project would not be affected by inundation as a result of seiche or tsunami. In addition, the project site is relatively flat, with no steep areas that would have the potential to generate mudflows during operation. Therefore, these issues are not addressed further in this Subsequent Environmental Impact Report (SEIR).

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.9-1: Violation of Water Quality Standards or Waste Discharge Requirements Related to Construction Activities

Project construction activities could result in soil erosion, sedimentation, and discharge of pollutants in nearby surface water bodies and groundwater, resulting in reduced water quality. The project applicant will control onsite stormwater and protect water quality through implementation of a SWPPP and associated BMPs, as required by federal and State regulations and the RHR Recyclable Material Bale Management Operations Plan approved by the County in April 2018. Therefore, this impact would be **less than significant**.

The landfill currently operates under WDR Order No. R5-2016-0056 issued by the Central Valley RWQCB. The WDR's require that the landfill comply with the requirements of a SWPPP for the site. However, a separate SWPPP would be required to address potential construction-related soil disturbance impacts. Project construction activities would involve ground-disturbance which could result in soil erosion and sedimentation of stormwater drainage systems. The construction process could also result in accidental release of other pollutants to surface waters, including oil and gas related to heavy equipment operation.

As part of project design and implementation, the project applicant would retain a California registered civil engineer to prepare a SWPPP that would include site-specific BMPs and any other necessary site-specific WDRs or waivers under the Porter-Cologne Act. The following identifies several BMPs that may be incorporated into the SWPPP for project implementation:

- preserve existing vegetation where possible;
- roughen surface of final grades to prevent erosion, decrease run-off, increase infiltration, and aid in vegetation establishment;
- establish riparian buffers or filter strips along the perimeter of the disturbed area to intercept pollutants prior to offsite discharge;
- place fiber rolls around onsite drain inlets to prevent sediment and construction-related debris from entering inlets;
- place fiber rolls along down-gradient disturbed areas of the site to reduce runoff flow velocities and prevent sediment from leaving the site;
- > place silt fences down-gradient of disturbed areas to slow down runoff and retain sediment;
- stabilize the construction entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles;
- stage excavated and stored construction materials and soil stockpiles in stable areas and cover materials to prevent erosion; and
- stabilize temporary construction entrances to limit transport/introduction of invasive species and control fugitive dust emissions.
- pollutants likely to be used during construction activities or that could be present in stormwater and nonstormwater discharges, as well as any other type of materials included in equipment operation;
- personnel training requirements and procedures that would be used to ensure that all workers are aware of the
 applicable regulations regarding the permit requirements.
- site inspection and maintenance responsibilities;
- ► spill prevention measures, including those mentioned above;

- ► a monitoring program to be implemented and carried out by the project applicant, which would include site inspections during dry and wet weather conditions to ensure personnel are following SWPPP conditions. A sampling analysis plan would also be included, as per the General Construction Permit; and
- appropriate supervisory personnel who would be responsible for carrying out the implementation of the SWPPP.

In addition, the RHR Recyclable Material Bale Management Operations Plan was approved by the County in April 2018 and requires RHR to implement best management practices (BMPs) related to stormwater control prior to storage of recyclable bales onsite. These BMPs are listed in Chapter 3, Section 3.7.4 of this SEIR, Because the project applicant would implement adequate measures to control onsite stormwater and protect water quality during construction as part of proposed project implementation, pursuant to regulatory requirements, the proposed project would not violate any water-quality standards or waste-discharge requirements, or otherwise result in short-term degradation of water quality. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.9-2: Violation of Water Quality Standards or Waste Discharge Requirements Related to Operation

Project operation could result in soil erosion, sedimentation, and discharge of pollutants in nearby surface water bodies and groundwater, resulting in reduced water quality. The new disposal expansion area would be constructed to isolate any runoff and/or materials onsite, including a composite liner system to collect and remove leachate from the landfill, to prevent pollutant discharge to groundwater. This liner, as well as compliance with federal and State regulations regarding water quality, would ensure that this impact would be **less than significant**.

The landfill currently operates under WDR Order No. R5-2016-0056 issued by the Central Valley RWQCB. The WDR's require that the landfill comply with the requirements of a SWPPP for the site. The new disposal expansion area would be constructed with a composite liner system that includes a leachate collection and removal system that efficiently collects and removes leachate from the landfill. Installation of the liner requires implementation of a base liner Construction Quality Assurance program, which documents that inspections have been conducted such that environmental controls and protection provided by the composite liner has been constructed to design specifications. Recology constructed a French drain system in Summer of 2016 in compliance with RWQCB directives to maintain groundwater separation. Engineered controls implemented at the site are designed to prevent any impact of the Recology operations on groundwater.

Because the disposal expansion area would include a composite liner system designed to protect groundwater from pollutants associated with operation of the landfill and Recology would adhere to WDRs as required by the RWQCB, operation of the proposed project would not violate any water-quality standards or waste-discharge requirements, or otherwise result in degradation of water quality. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.9-3: Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge

With proposed expansion of the landfill, project implementation would require extended water use onsite related to dust control for the extended life of the landfill, and the current source of onsite water, the borrow pit, would be deepened and widened as part of the project. The project would not require groundwater supplies in excess of current demands. The change in the acreage of impervious surfaces would be negligible. Therefore, this impact would be **less than significant**.

Water use at the RHR Landfill is limited to dust control for landfill operations and washing and restroom uses at the RHR Landfill office. Water for dust control is supplied by dewatering of the borrow pit, and water for RHR Landfill wash/restroom uses is supplied by non-potable well water. Project implementation would not result in a change in the volume of water use onsite, as no additional employees are proposed and the roadways are watered for dust control regardless of the intensity of operations as required by the Yolo-Solano Air Quality Management District. The RHR Landfill would continue to use water from borrow pit dewatering for dust control during project construction and during operations following project implementation. As existing disposal modules are completed, they would be seeded with groundcover and no longer require watering for dust control purposes, which is only required in active disposal areas. As new disposal modules are opened, they would use the water no longer needed for completed modules, thus resulting in no increase in daily water demand. Also, operational water demands are offset by the beneficial reuse of leachate and compost process water for dust control purposes. Additionally, no changes are proposed to the rate of well draw as there would be no changes to the number of RHR employees. Consequently, project implementation would not require groundwater supplies in excess of current demands.

Project implementation would not result in an increased daily demand for water; however, it would result in additional impervious surfaces (as a result of the proposed liner within the Triangle) that could limit groundwater recharge. Groundwater aquifers beneath the site are recharged by infiltration of precipitation and irrigation watering, subsurface flows from Ulatis and Alamo Creeks, and subsurface flow from the coastal hills to the west of the project site. Groundwater supplies within Solano County have been relatively stable since historical groundwater overdraft was corrected with construction of Monticello Dam in the late 1950s and subsequent delivery of surface water from the Solano Project (SCWA 2019). At least 16 acres and up to 24 acres of undeveloped land would be converted to impervious surfaces, which would be a small change in the context of regional groundwater recharge potential. Additionally, the project site and vicinity have been identified as having poor recharge capacity due to factors such as deep percolation, topography, chemical limitations, and soil surface condition (UC Davis 2018). This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.9-4: Changes to Drainage Patterns or Stormwater Runoff that Would Create Flooding or Exceed the Capacity of Existing or Planned Storm Drains

Project implementation would result in a negligible increase in impervious surfaces across the site. With implementation of the project, the RHR Landfill's existing surface water management system would be extended and expanded to include the landfill expansion area. As required by existing WDRs issued by the Central Valley RWQCB, the surface water management system would be designed to handle a minimum 100-year, 24 hour storm event such that any additional runoff generated onsite would be retained at the landfill property and no offsite flooding or potential capacity exceedances of existing or planned storm drains would occur. Therefore, this impact would be **less than significant**.

The volume and rate of stormwater runoff generated from an area is affected by development through conversion of vegetated or pervious surfaces to impervious surfaces and by the development of drainage systems that connect these impervious surfaces to streams or other water bodies. In this way, development can increase the rate of runoff and eliminate storage and infiltration that would naturally occur along drainage paths. As water runs off the land surface, it collects and carries materials and sediment, which can be potentially harmful to downstream receiving waters. Additionally, runoff from impervious surfaces can become concentrated, overwhelming existing storm drain systems, causing erosion and increasing sediment transport, downstream deposition, and flooding in lower watershed areas.

Project implementation would include conversion of at least 16 acres of pervious surfaces to impervious surfaces. As discussed in Impact 4.9-2, landfill expansion would require installation of a composite liner system to collect and remove leachate from the landfill to prevent pollutant discharge to groundwater. While this conversion could result in
changes to drainage patterns or stormwater runoff, the RHR Landfill's existing surface water management system is designed to handle a minimum 100-year, 24-hour storm event and would be expanded to include the Triangle in a manner consistent with the applicable WDRs. The existing drainage ditch within the project site would be filled, and a new ditch would be constructed along the southern boundary of the Triangle, where it would connect to the landfill's existing perimeter ditches to both the east and west. Stormwater is collected on the disposal modules in drainage ditches, diversion berms and down drains where it is then conveyed away from exposed refuse and into two interior drainage channels that drain the northern and southern portions of the site. During the rainy season, Recology is required to inspect the drainage controls to verify that they are properly working. Areas of ponding identified within the landfill will be regraded to provide positive drainage as soon as weather conditions permit. As required in WDR R5-2016-0056, MRP Section A.7.b, the site inspects the precipitation, diversion, and drainage facilities within 7 days following major storm events. The additional impervious surfaces of the project would not reduce the capacity of the existing surface water management system. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

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4.10 NOISE

This section includes a description of acoustic fundamentals, a summary of applicable regulations related to noise and vibration, a description of existing ambient noise conditions, and an analysis of potential short-construction and long-term operational noise impacts associated with implementation of the project.

No comments related to noise were received during public review of the Notice of Preparation (NOP) for the proposed project

4.10.1 Terminology

Before discussing the noise setting for the project, background information about sound, noise, vibration, and common noise descriptors is needed to provide context and understanding of the technical terms referenced throughout this section.

Sound, Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a human ear. Noise is defined as loud, unexpected, annoying, or unwanted sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz, or thousands of hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this large range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB).

Addition of Decibels

Because decibels are logarithmic units, SPLs cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase in loudness. In other words, when two identical sources are each producing sound of the same loudness at the same time, the resulting sound level at a given distance would be 3 dB higher than if only one of the sound sources was producing sound under the same conditions. For example, if one idling truck generates an SPL of 70 dB, two trucks idling simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level approximately 5 dB louder than one source.

A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz and perceive sounds within this range better than sounds of the same amplitude with frequencies outside of this range. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of A-weighted decibels) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgment correlates well with the A-scale sound levels of those sounds. Thus, noise levels are typically reported in terms of A-weighted decibels. All sound levels discussed in this section are expressed in A-weighted decibels. Common sources of environmental noise and associated noise levels are presented in Table 4.10-1.

Common Outdoor Activities	Noise Level (dB)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet	100	
Gas lawnmower at 3 feet	90	
Diesel truck moving at 50 mph at 50 feet	80	Food blender at 3 feet, Garbage disposal at 3 feet
Noisy urban area, Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet, Normal speech at 3 feet
Commercial area, Heavy traffic at 300 feet	60	
Quiet urban daytime	50	Large business office, Dishwasher in next room
Quiet urban nighttime	40	Theater, Large conference room (background)
Quiet suburban nighttime	30	Library, Bedroom at night, Concert hall (background)
Quiet rural nighttime	20	Broadcast/Recording Studio
	10	
Threshold of Human Hearing	0	Threshold of Human Hearing

Table 4.10-1	Typical Noise Levels
	Typical Noise Levels

Notes: dB = A-weighted decibels; mph= miles per hour

Source: Caltrans 2009

Human Response to Changes in Noise Levels

The doubling of sound energy results in a 3-dB increase in the sound level. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different from what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear can discern 1-dB changes in sound levels when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000–8,000 Hz) range. In general, the healthy human ear is most sensitive to sounds between 1,000 and 5,000 Hz and perceives both higher and lower frequency sounds of the same magnitude with less intensity (Caltrans 2013a:2-18). In typical noisy environments, changes in noise of 1–2 dB are generally not perceptible. However, it is widely accepted that people can begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness (Caltrans 2013a:2-10). Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3-dB increase in sound would generally be perceived as barely detectable.

Common Noise Descriptors

Noise in our daily environment fluctuates over time. Various noise descriptors have been developed to describe timevarying noise levels. The following are the noise descriptors used throughout this section.

Equivalent Continuous Sound Level (Leq): Leq represents an average of the sound energy occurring over a specified period. In effect, Leq is the steady-state sound level containing the same acoustical energy as the time-varying sound level that occurs during the same period (Caltrans 2013a:2-48). For instance, the 1-hour equivalent sound level, also referred to as the hourly Leq, is the energy average of sound levels occurring during a 1-hour period and is the basis for noise abatement criteria used by the California Department of Transportation (Caltrans) and FTA (Caltrans 2013a:2-47, FTA 2006:2-19).

Maximum Sound Level (L_{max}): L_{max} is the highest instantaneous sound level measured during a specified period (Caltrans 2013a:2-48, FTA 2006:2-16).

Day-Night Level (L_{dn}): L_{dn} is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB "penalty" applied to sound levels occurring during nighttime hours between 10:00 p.m. and 7:00 a.m. (Caltrans 2013a:2-48, FTA 2006:2-22).

Community Noise Equivalent Level (CNEL): CNEL is the energy average of the A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to sound levels occurring during the nighttime hours between 10:00 p.m. and 7:00 a.m. and a 5-dB penalty applied to the sound levels occurring during evening hours between 7:00 p.m. and 10:00 p.m. (Caltrans 2013a:2-48).

Sound Propagation

When sound propagates over a distance, it changes in level and frequency content. The manner in which a noise level decreases with distance depends on the following factors.

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Roads and highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources, thus propagating at a slower rate in comparison to a point source. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

Ground Absorption

The propagation path of noise from a source to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective-wave canceling provides additional attenuation associated with geometric spreading. Traditionally, this additional attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), additional ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the attenuate rate associated with cylindrical spreading, the additional ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance. This would hold true for point sources, resulting in an overall drop-off rate of up to 7.5 dB per doubling of distance.

Atmospheric Effects

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels, as wind can carry sound. Sound levels can be increased over large distances (e.g., more than 500 feet) from the source because of atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also affect sound attenuation.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction (Caltrans 2013a:2-41; FTA 2006:5-6, 6-25). Barriers higher than the line of sight provide increased noise reduction (FTA 2006:2-12). Vegetation between the source and receiver is rarely effective in reducing noise because it does not create a solid barrier unless there are multiple rows of vegetation (FTA 2006:2-11).

VIBRATION

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery or transient in nature). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2006; Caltrans 2013b). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to compress the range of numbers required to describe vibration (FTA 2006). This is based on a reference value of 1 micro inch per second (µin/sec).

The typical background vibration-velocity level in residential areas is approximately 50 VdB. Ground vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FTA 2006).

Typical outdoor sources of perceptible ground vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Table 4.10-2 describes the general human response to different ground vibration-velocity levels.

Vibration-Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Table 4.10-2 Human Response to Different Levels of Ground Noise and Vibration

Notes: VdB = vibration decibels referenced to 1 μ inch/second and based on the root mean square velocity amplitude.

Source: FTA 2006:7-8

4.10.2 Regulatory Setting

Key federal, State, and local regulatory planning issues applicable to the project for noise-related impacts are discussed below. Background information on acoustical fundamentals, also described below, is required context for regulatory and planning issues.

FEDERAL

The Federal Noise Control Act of 1972

The primary motivating legislation for noise control in the United States was provided by the Federal Noise Control Act of 1972, which addressed the issue of noise as a threat to human health and welfare, particularly in urban areas. In response to the Noise Control Act, the U.S. Environmental Protection Agency (EPA) published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA 1974). In summary, EPA findings were that sleep, speech, and other types of essential activity interference could be avoided in residential areas if the L_{dn} did not exceed 55 A-weighted sound levels (dB) outdoors and 45 dB indoors. EPA's intent was not that these findings necessarily be considered as mandatory standards, criteria, or regulatory goals, but as advisory exposure levels below which there is no reason to suspect that the general population would be at risk from any of the identified health or welfare effects of noise. EPA's *Levels* report also identified 5 dB as an adequate margin of safety before an increase in noise level would produce a significant increase in the severity of community reaction (i.e., increased complaint frequency, annoyance percentages, etc.) provided that the existing baseline noise exposure did not exceed 55 dB L_{dn}.

U.S. Department of Transportation

To address the human response to ground vibration, FTA has set forth guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines are presented in Table 4.10-3.

Land Use Category	GVB Impact Levels (VdB re 1 micro- inch/second) Frequent Events ¹	GVB Impact Levels (VdB re 1 micro- inch/second) Occasional Events ²	GVB Impact Levels (VdB re 1 micro- inch/second) Infrequent Events ³
Category 1: Buildings where vibration would interfere with interior operations.	65 ⁴	65 ⁴	65 ⁴
Category 2: Residences and buildings where people normally sleep.	72	75	80
Category 3: Institutional land uses with primarily daytime uses.	75	78	83

Table 4.10-3 Ground-Borne Vibration (GBV) Impact Criteria for General Assessment

Notes: VdB = vibration decibels referenced to 1 µ inch/second and based on the root mean square (RMS) velocity amplitude.

^{1.} "Frequent Events" is defined as more than 70 vibration events of the same source per day.

^{2.} "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

- ^{3.} "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.
- ^{4.} This criterion is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research would require detailed evaluation to define acceptable vibration levels.

Source: FTA 2006

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County General Plan

Table 4.10-4 presents the transportation noise standards established in the Solano County General Plan. Table 4.10-5 presents the noise standards from the Solano County General Plan that apply to non-transportation noise sources.

New Land Use	Sensitive Outdoor Area (dB Ldn)	Sensitive Interior ¹ Area (dB Ldn)	County Notes
All Residential	65	45	2
Transient Lodging	65	45	2, 3
Hospitals and Nursing Homes	65	45	2, 3, 4
Theaters and Auditoriums	-	35	3
Churches, Meeting Halls, Schools, Libraries, etc.	65	40	3
Office Buildings	65	45	3
Commercial Buildings	-	50	3
Playgrounds, Parks, etc.	70	-	
Industry	65	50	3
All Residential	65	45	2

Table 4.10-4 Solano County Transportation Noise Standards

Notes: dB = A-weighted decibels; $L_{dn} = day$ -night average noise level

¹ Interior noise-level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

² If these uses are affected by nighttime railroad passages, the potential for sleep disturbance shall be addressed.

^{3.} Where there are no sensitive exterior spaces proposed for these uses, only the interior noise-level standard shall apply.

^{4.} Hospitals are often noise-generating uses. The exterior noise-level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

Source: Solano County General Plan 2015

Table 4.10-5 Solano County Non-Transportation Noise Standards

Noise Level Descriptor	Outdoor Area Average (dB Leq)/Maximum (dB Lmax) Daytime	Outdoor Area Average (dB Leq)/Maximum (dB Lmax) Nighttime	Interior ² Average (dB L _{eq})/Maximum (dB L _{max}) Day and Night	County Notes
All Residential	55/70	50/65	35/55	
Transient Lodging	55/75	_	35/55	3
Hospitals and Nursing Homes	55/75	_	35/55	4,5
Theaters and Auditoriums	_	_	30/50	5
Churches, Meeting Halls, Schools, Libraries, etc.	55/75	_	35/60	5
Office Buildings	60/75	-	45/65	5
Commercial Buildings	55/75	_	45/65	5
Playgrounds, Parks, etc.	65/75	_	_	5
Industry	60/80	-	50/70	5

Notes: L_{eq} = equivalent or energy-averaged sound level; L_{max} = Highest root-mean-square sound level measured over a given period of time; dB = A-weighted decibels; Daytime = 7:00 a.m. to 10:00 p.m.; Nighttime = 10:00 p.m. to 7:00 a.m.

^{1.} The standards shall be reduced by 5 dB for sounds consisting primarily of speech or music, and for recurring impulsive sounds. If the existing ambient noise level exceeds the standards, then the noise level standards shall be increased at 5-dB increments to encompass the ambient.

² Interior noise-level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

^{3.} Outdoor activity areas of transient lodging facilities are not commonly used during nighttime hours.

^{4.} Hospitals are often noise-generating uses. The exterior-noise-level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

^{5.} The outdoor activity areas of these uses (if any), are not typically utilized during nighttime hours.

Source: Solano County General Plan 2015

The Solano County General Plan also includes the following policies relevant to the project:

- Policy HS.P-48: Consider and promote land use compatibility between noise-sensitive and noise-generating land uses when reviewing new development proposals.
- ▶ Policy HS.P-51: Develop strategies with residents and businesses to reduce noise conflicts.
- ► Policy HS.P-52: Minimize noise conflicts between current and proposed land uses and transportation networks by encouraging compatible land uses around critical areas with higher noise potential.

Solano County Code

The Solano County Code, Chapter 28, Land Use Regulations, includes standards to control excessive noise and vibration in the unincorporated County.

County Code 28.70.10 General Development Standards Applicable to All Uses in Every Zoning District

- B. Performance Standards. Except as provided in Chapter 2.2, any use of land or buildings must meet the applicable performance standards listed below:
 - 1b. All uses of land and buildings shall be conducted in a manner, and provide adequate controls and operational management to prevent ... noise that exceeds 65 dB L_{dn} at any property line.

4.10.3 Environmental Setting

SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses to which noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise. Parks, schools, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Places of worship, transit lodging, and other places where low interior noise levels are essential are also considered noise-sensitive.

Existing noise- and vibration- sensitive land uses in the vicinity of the project site include single-family residences. The nearest sensitive receptors are a group of single-family residences located to the west of the project site, to the north of Hay Road, and east of Dally Road. The closest sensitive receptor is a single-family residence on the north side of Hay Road approximately 4,020 feet west of the project site and 9,650 feet northwest of where project construction would occur. The project site is directly surrounded to north, south, east, and west by agricultural land uses and open space areas.

EXISTING NOISE LEVELS

The existing noise environment in the project area is primarily influenced by transportation noise from vehicle traffic on the nearby transportation network (e.g., State Route 113, Hay Road). Other noise sources include existing Recology Hay Road (RHR) Landfill activities, seasonal harvesting activities in adjacent farmland, birds, and livestock. In addition, and to a lesser extent, occasional aircraft noise associated with the operation of Travis Air Force Base (approximately 3.3 miles southwest of the project site) may influence the existing noise environment. Those noise sources noted above are also considered sources of vibration in the project area.

Existing traffic noise levels along affected roadways are shown in Table 4.10-6. Vehicles enter the project site from Hay Road along the northside of the project site including bulldozers, scrapers, loaders, graders, and water trucks that are part of existing landfill operations. Based on noise modeling of existing operations at the project site, noise levels generated by project operations at the nearest sensitive receptor attenuate to 38.5 L_{eq} dB and 42.4 L_{max} dB.

4.10.4 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Based on Appendix G of the State CEQA Guidelines, the project would result in a potentially significant impact related to noise if it would:

- generate a substantial permanent increase (i.e., 3 dB or more) in ambient noise levels from non-transportation noise source in the project vicinity above levels existing without the project (e.g., long-term exposure of nearby sensitive receptors to increased noise levels that exceed Solano County's non-transportation noise standards in Table 4.10-5, or State Noise Insulation of 45 dB CNEL for interior spaces in residential units);
- generate a substantial permanent increase (i.e., 3 dB or more) in ambient noise levels from transportation noise source in the project vicinity above levels existing without the project (e.g., long-term exposure of nearby sensitive receptors to increased noise levels that exceed Solano County's transportation noise standards in Table 4.10-4 or State Noise Insulation of 45 dB CNEL for interior spaces in residential units);
- ► generate a substantial temporary or periodic increase (i.e., 3 dB or more) in ambient noise levels in the project vicinity above levels established in Solano County's transportation noise standards in Table 4.10-4 or non-transportation noise standards in Table 4.10-5 during the more sensitive times of the day (i.e., 10:00 p.m. to 7:00 a.m.).
- generate excessive groundborne vibration or groundborne noise levels (e.g., levels that exceed Caltrans' recommended level of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or FTA's maximum acceptable level of 80 VdB with respect to human response for residential uses [i.e., annoyance] at nearby vibration-sensitive land uses); or
- ► for a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the exposure of people residing or working in the project area to excessive noise levels.

METHODS AND ASSUMPTIONS

To assess potential short-term (construction-related) noise impacts and onsite (operation-related) noise impacts from changes to onsite operations from the project, sensitive receptors and their relative exposure were identified. Information regarding the number and types of equipment to be used during project construction as well as during onsite operations were taken from the project's Air Quality Impact Assessment report (See Appendix D) to ensure consistency with other modeling assumptions (e.g., air quality modeling and greenhouse gas emissions modeling) conducted for this project. Project-generated construction- and onsite operation-related noise levels were estimated based on methodologies, reference emission levels, and usage factors from FTA's Guide on Transit Noise and Vibration Impact Assessment methodology (FTA 2006) and the Federal Highway Administration's Roadway Construction Noise Model User's Guide (FHWA 2006).

To assess long-term (operation-related) noise impacts due to project-generated increases in traffic, modeling was conducted for affected roadway segments based on Caltrans' Traffic Noise Analysis Protocol (Caltrans 2006) and the Technical Noise Supplement (Caltrans 2009) and project-specific traffic data. Refer to Appendix J of this Draft SEIR for the noise modeling details. The analysis is based on the reference noise emission levels for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors. Data regarding increases in heavy truck volume on area roadways as a result of the project were provided by the traffic report conducted for the project (See Appendix G, "Traffic Impact Analysis", of this Draft SEIR). The percentage of heavy-duty vehicles on area roadways under existing and existing-plus project conditions is provided in the appendix of the traffic report. The traffic noise modeling conducted does not account for any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings) and; consequently, represents worst-case traffic noise levels.

The significance of noise impacts from the project on sensitive receptors were determined based on comparisons to applicable regulations and guidance provided by the noise standards included in Section 4.10.1, "Regulatory Settings".

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

Construction and operation of the project would not result in activities or equipment that generate noticeable levels of ground vibration, such as pile driving, drilling, or blasting. Furthermore, nearby receptors would be located no less than one mile from project-related, onsite activities. Therefore, the potential for ground vibration–related impacts is not anticipated, and this issue is not discussed further.

The project would not result in new sensitive receptors or changes to aircraft activity in the area. Changes in aircraftrelated noise are not anticipated, and this issue is not discussed further.

PROJECT IMPACTS AND MITIGATION MEASURES

Impact 4.10-1: Short-Term Construction Noise

Project implementation would result in construction activity associated with the expansion of the existing landfill capacity. However, construction-generated noise levels would not exceed the applicable daytime or nighttime noise exposure standards established by the County for non-transportation noise sources at any sensitive receptors. Therefore, this impact would be **less than significant**.

Project implementation would include a series of changes to the existing project site including a lateral expansion of the existing landfill capacity, resulting in construction activity in the southeast portion of the project site as shown in Exhibit 3-2 in Chapter 3, "Project Description". Construction activities would include the installation of a base liner containment system and excavation for the realignment of a drainage ditch for the expanded landfill area. The project would be constructed in three phases, one phase of initial site preparation work, and two phases of base liner construction, each of which would be approximately 10-acres in size. Construction activity would involve the use of heavy-duty construction equipment including excavators, dozers, graders, scrapers, crawler tractors, cranes, and forklifts. It is assumed that construction activity would occur during daytime hours (i.e., 7:00 a.m. to 10:00 p.m.). Based on construction noise modeling, which included six of the loudest pieces of construction equipment (i.e., dozers, scrapers, graders) operating simultaneously near each other, construction activity would not expose offsite noise-sensitive receptor would attenuate to 29 L_{eq} dB and 39 L_{max} dB. Therefore, construction activity would not expose offsite noise-sensitive receptors to levels of noise that exceed Solano County's non-transportation daytime residential noise standards of 55 L_{eq} dB and 70 L_{max} dB (Table 4.10-5). Even if construction activity were to occur during nighttime hours (i.e., 10:00 p.m. to 8:00 a.m.), construction-generated noise would not exceed the non-transportation nighttime residential noise standard of 50 L_{eq} dB and 65 L_{max} dB (Table 4.10-5). Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation measures required.

Impact 4.10-2: On-Site Operational Noise

Project implementation would result in the expansion of the existing landfill capacity as well as other modifications to the landfill. The expansion of the existing landfill capacity and other modifications would not result in changes in daily operations at the landfill and would not result in an increase in the number of facility employees. The project would also incorporate the processing of construction and demolition materials. Based on noise modeling conducted, noise levels generated by project-related operational activity would not increase and would not expose offsite receptors to noise levels that exceed applicable noise standards. This impact would be **less than significant**.

As a result of project implementation, the disposal capacity of the landfill would increase from 37 million cubic yards to 45.8 million cubic yards and extend the potential life of the compost facility by at least four years. However, as

noted in Section 3, "Project Description," the increase in disposal capacity of the landfill would be incorporated into the current daily operation and maintenance at the landfill. Aside from the increase in daily trips to the project site, the project is not anticipated to result in an increase in the daily operational activity on the project site or result in an increase in the number of facility employees. Existing landfill operations includes daily use of heavy equipment including three bulldozers, two scrapers, two refuse compactors, four loaders, a grader, and two water trucks.

The project would result in modifications to existing onsite operations to include portable equipment to be used within the permitted landfill boundary for the sorting, separation, and processing of construction and demolition materials. Incoming construction and demolition waste streams would be processed using portable equipment, primarily screens, sort lines, and a shredder, which could be moved around the site as the disposal area shifts within the landfill. The exact type and models of equipment that would be used in the sorting, separation, and processing of construction and demolition materials are not known at this time. However, operation of this equipment is anticipated to generate noise levels similar to those generated by other similar pieces of heavy-duty construction equipment used in existing facility operations (i.e., 85 L_{max} dB at 50 feet).

Noise modeling was conducted to analyze potential operational noise impacts on nearby sensitive receptors. Noise modeling included four of the loudest pieces of heavy-duty equipment (i.e., dozers, scrapers, graders) used in facility operations, heavy-duty trucks, and the new use of demolition and construction material processing equipment. Based on the noise modeling, noise levels generated from facility operations under the project would attenuate to 38.5 L_{eq} dB and 42.4 L_{max} dB at the nearest offsite noise sensitive receptors. Thus, which is approximately the same as current levels as discussed above in Section 4.10.2. The RHR Landfill is currently permitted to operate seven days per week, 365 days per year, on a 24-hour basis. The landfill is open to commercial and contract haulers 24 hours per day and is open to the public from 8:00 a.m. to 4:00 p.m. The delivery of asbestos-containing waste and all designated wastes is limited to the hours of 7:00 a.m. to 4:00 p.m., Monday through Saturday. Based on modeled noise levels, operational activity would not expose offsite noise-sensitive receptors to noise levels that exceed the County's non-transportation nighttime residential noise standard of 50 L_{eq} dB and 65 L_{max} dB (Table 4.10-5). Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation measures required.

Impact 4.10-3: Traffic-Related Noise

Project implementation would result in an estimated 195 additional daily trips to the landfill facility. Project-generated traffic volume increases along affected roadways would result in an increase in traffic noise levels along these roadways. However, based on traffic noise modeling conducted for the project, traffic noise levels along affected roadways would not exceed the County's transportation noise standards at any noise-sensitive receptors. As a result, this impact would be **less than significant**.

The project would result in additional vehicle trips to and from the project site. Based on estimates included in the project traffic report, the project would result in an estimated 195 additional daily round trips to the project site by 91 new semi-trailer trips, 23 additional packer trucks, and 81 new self-haul vehicles. These increases in traffic volumes would result in traffic noise level increases along affected roadways. Table 4.10-6 summarizes the roadside noise levels under existing conditions and existing-plus project conditions.

Table 4.10-6 Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions Conditions

Roadway Segment	L _{dn} (dB) at 100 feet from Roadway Centerline Existing Conditions	L _{dn} (dB) at 100 feet from Roadway Centerline Existing-Plus-Project Conditions
Hay Road between Lewis Road and Project Site Entrance	58.2 ¹	58.6
SR 113 between SR 12 and Hay Road	61.3	61.6
SR 113 between Midway Road and Hay Road	59.3	60.0
Midway Road between Porter Road and SR 113	60.4	60.6

Notes: SR = State Route; dB = A-weighted decibels; L_{dn} = day-night average noise level

^{1.} Traffic noise levels along the segment of Hay Road between Lewis Road and the project site entrance were estimated at a distance of 70 feet from the roadway centerline because this is the distance to the nearest noise-sensitive receptor.

Source: Modeled by Ascent Environmental 2019

As shown in Table 4.10-6, traffic noise levels under existing-plus project conditions would not exceed the County's most stringent transportation noise standard of 65 L_{eq} dB (Table 4.10-4). Moreover, none of the traffic noise increases would be noticeable (i.e., 3 dB or greater). For these reasons, this impact would be **less than significant**.

Mitigation Measures

No mitigation measures required.

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4.11 TRANSPORTATION

This section discusses the existing roadway network and transportation facilities in the project vicinity; describes the applicable federal, state, and local regulations and policies related to transportation; describes existing traffic and circulation conditions within the surrounding area; and analyzes the potential near- and long-term impacts from project activities on transportation and traffic. The analysis provided herein is based on a Traffic Impact Analysis (TIA) for the Recology Hay Road (RHR) Landfill Project conducted by KD Anderson and Associates, Inc. (KDA) (Appendix G of this Draft SEIR).

Comment letters pertaining to traffic and transportation were received in response to the Notice of Preparation for the proposed project from the California Department of Transportation (Caltrans) -District 4 and local residents. Traffic-related comments from Caltrans include general reminders related to grading and drainage requirements if the project were to impact a channel running parallel west of (State Route) SR 113 and the need for an encroachment permit from Caltrans should any work or traffic control that encroaches onto the state right-of-way occur. Traffic concerns from local residents were primarily related to the potential damage to SR 113 and other haul roads that could occur with an increase in daily truck trips.

4.11.1 Regulatory Setting

FEDERAL PLANS, POLICIES, AND REGULATIONS

No federal plans, policies, regulations, or laws related to transportation and circulation are applicable to the analysis in this Subsequent Environmental Impact Report (SEIR).

STATE PLANS, POLICIES, AND REGULATIONS

The California Department of Transportation (Caltrans) has set a minimum level of service (LOS) standard for state highways of LOS D in rural areas (populations less than 2,500), LOS E in urban clusters (populations 2,500 to 49,999), and LOS E in urbanized areas (populations over 50,000). These standards may vary depending on the corridor conditions and if a transportation concept report, specific to a SR, has been prepared. However, generally within the project area and for the purposes of this analysis, LOS D would be considered acceptable for state highways within the project area.

State Route 113 Transportation Concept Report

Transportation concept reports are long-term planning documents that Caltrans prepares for each highway within its jurisdiction. The purpose of these reports is to determine how a highway will be developed and managed over a 20-year planning horizon. A transportation concept report (TCR) was prepared for SR 113, which is included in the project study area and is under Caltrans' jurisdiction. The TCR does not identify a targeted LOS for the segment of SR 113 in the vicinity of the project site; however, it does identify the planning horizon concept for this segment as remaining as a two-lane conventional facility (Caltrans 2011). No TCR has been prepared for SR 12 as of the publication date of this EIR.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS AND ORDINANCES

Solano County Road Improvement Standards and Land Development Requirements

Section 1-4 of the Solano County Road Improvement Standards and Land Development Requirements (Solano County 2006) states that it is the goal of Solano County to maintain LOS C for all roads and intersections. Additionally, all projects shall be designed to maintain LOS C for all Solano County roadway facilities, except where the existing facility currently operates below LOS C, in which case, the project shall be designed such that there will be no decrease in the existing LOS.

4.11.2 Environmental Setting

The following discussion describes the existing environmental transportation setting, which is the baseline scenario upon which project-specific impacts are evaluated. The baseline for this study represents conditions based on collected data and field observations. The environmental setting for transportation includes baseline descriptions for roadway, bicycle, pedestrian, and transit facilities.

PROJECT STUDY AREA

The project study area includes the project routes from the Interstate 80 (I-80) / Midway Road interchange to the north, and from the SR 113 / SR 12 intersection to the south. Based on allowable routes to and from the landfill as established under the RHR Road and Litter Agreement with the County, six roadway segments and eight intersections that provide access to the landfill site were evaluated within the study area.

Existing Roadway Network

SR 113 is a two-lane road in Solano County beginning at SR 12 to the south and runs north past I-80, continuing through Davis and Woodland to its terminus in Sutter County. Between SR 12 and Midway Road, the road has varying shoulder widths, ranging from approximately 10 feet at intersections to zero feet at points along the segments. The speed limit is 55 miles per hour (mph). SR 113 is identified in Solano County as a major arterial.

Midway Road is a two-lane road running east-west between I-80 and SR 113. The road has varying shoulder widths, ranging from 0 to 8 feet in width. The speed limit is 55 mph. Midway Road is identified in Solano County as a County Route of Regional Significance.

Hay Road is a two-lane local road running east-west between Meridian Road and SR 113. The road has shoulder widths ranging from zero to two feet in width. The speed limit is 55 mph. Hay Road is identified in Solano County as a collector road.

Study Intersections

The following eight intersections within the study area were evaluated as part of the TIA:

- 1. I-80 Westbound Ramps / Oday Road
- 2. Midway Road / Oday Road
- 3. I-80 Eastbound Ramps / Midway Road
- 4. Midway Road / Porter Road
- 5. SR 113 / Midway Road
- 6. SR 113 / Hay Road
- 7. SR 113 / SR 12
- 8. Hay Road / Project Entrance

Each study intersection is described below:

I-80 Westbound Ramps / Oday Road is a T-intersection with a hook on/off ramp. The I-80 off-ramp intersection approach is stop controlled. The Oday Road approaches consist of single lanes providing shared through and left or right turn movements. The westbound off-ramp includes a stop-controlled left turn lane and a yield controlled short right turn lane.

Midway Road / Oday Road is an unsignalized T-intersection. The Oday Road intersection approach is stop controlled. Westbound Midway Road includes a through lane with a free right turn lane onto Oday Road. Eastbound Midway Road includes a shared through-left lane while Oday Road consists of a single lane approach.

Midway Road / I-80 Eastbound Ramps is an unsignalized diamond configuration (L-1) intersection. Midway Road in both directions consist of a single lane with the eastbound approach providing a shared through left lane and the westbound approach providing a shared through-right lane. The I-80 off-ramp is stop-controlled for through and left turn movements while the right turn movement merges onto eastbound Midway Road.

Midway Road / Porter is an unsignalized T-intersection. Eastbound Midway Road bypasses the Porter Road intersection while westbound Midway Road tees into Porter Road. The westbound left turn is stop controlled while the westbound right turn is yield controlled. The northbound and southbound approaches along Porter Road only allow through movements.

SR 113 / Midway Road is an unsignalized four-way intersection with stop control along the Midway Road approaches. The SR 113 approaches include left turn lanes and a shared through-right lane while the Midway Road approaches are a single lane. Midway Road is the designated truck route for the site.

SR 113 / Hay Road is an unsignalized T-intersection with stop control along the Hay Road approached. All approaches are single lanes.

SR 12 / SR 113 – Birds Landing Road is an unsignalized four-way, stop-controlled intersection. The SR 12 approaches include a left turn lane, a through lane and a right turn lane. Both the northbound Birds Landing Road approach and the SR 113 approach include a shared through-left lane and a right turn lane. Caltrans has an identified safety project that would construct a single lane roundabout at this intersection. Construction began in April 2019 and is slated for completion by October 2019. (Note to County: based on current project schedules, this may be completed prior to issuance of the Draft SEIR. Recommend leaving for now.)

Hay Road / Project Access is an unsignalized stop-controlled T-intersection that provides project access. Westbound Hay Road includes a through lane and a left turn lane while the eastbound approach includes a shared through-right lane. The project entrance is unstriped but wide enough to allow both right and left turning vehicles to queue.

Bicycle and Pedestrian Facilities

Due to the rural nature of the project location, there are no bike or pedestrian facilities present within the study area.

Transit Facilities

The Fairfield and Suisun Transit System (FAST), Rio Vista Delta Breeze, Solano Express and Vacaville City Coach all provide bus service in Solano County. These services provide local and intercity routes along the I-80 corridor; however, there are no routes along Midway Road or SR 113 within the study area.

EXISTING TRAFFIC VOLUMES

Traffic Data Collection

AM and PM mid-week peak hour traffic counts were collected at the study intersections in late January and early February 2018. Traffic counts were also collected in late January 2018 at four study intersections (SR 113/Midway Road, SR 113/Hay Road, SR 113/SR 12, and Hay Road/Project Entrance) during the Saturday mid-day peak period. Due to the reopening of the I-80 / Midway Road interchange in July 2018, new counts were conducted at three study intersections (I-80 Westbound Ramps/Oday Road, Midway Road/Oday Road, and I-80 Eastbound Ramps/Midway Road) in early October 2018. Figure 4.11-1 presents the intersection turning movement volumes at each study intersection.

Intersection Level of Service

Study intersections and project driveways were analyzed using the concept of LOS. LOS is a qualitative measure of traffic operating conditions whereby a letter grade, from A (the best) to F (the worst), is assigned to an intersection or roadway segment. These grades represent the perspective of drivers and are an indication of the comfort and convenience associated with driving. Table 4.11-1 displays the delay range associated with each LOS category for signalized intersections, unsignalized intersections, and for roadway segments.



Figure 4.11-1 Existing Traffic Volumes and Lane Configurations



Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
A	Uncongested operations, all queues clear in a single-signal cycle. Ave Delay <u><</u> 10 sec/veh	Little or no delay. Ave Delay <u><</u> 10 sec/veh	Completely free flow.
В	Uncongested operations, all queues clear in a single cycle. Delay > 10 sec/veh and \leq 20 sec/veh	Short traffic delays. Delay > 10 sec/veh and <u><</u> 15 sec/veh	Free flow, presence of other vehicles noticeable.
С	Light congestion, occasional backups on critical approaches. Delay >20 sec/veh and <35 sec/veh	Average traffic delays. Delay > 15 sec/veh and <u><</u> 25 sec/veh	Ability to maneuver and select operating speed affected.
D	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35 sec/veh and < 55 sec/veh	Long traffic delays. Delay > 25 sec/veh and <u><</u> 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
E	Severe congestion with some long-standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay >55 sec and < 80 sec/veh	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and <u><</u> 50 sec/veh	At or near capacity, flow quite unstable.
F	Total breakdown, stop-and-go operation. Delay > 80 sec/veh	Intersection often blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Table 4.11-1Level of Service Definitions

Notes: sec/veh = seconds per vehicle

Source: Transportation Research Board 2010

LOS is based on and measured in terms of delay (seconds) per vehicle for the peak fifteen-minute analysis period. For unsignalized minor leg stop controlled intersections the movement with the worst delay approach movement is considered the critical LOS for the intersection. For multiway stop-controlled intersections the LOS is determined based on the overall average delay in the intersection.

Various methodologies exist to determine operating LOS at signalized intersections. The available techniques vary with regard to factors such as traffic signal timing, interaction between adjoining signals, etc. At unsignalized intersections the number of gaps in through traffic, gap acceptance time and corresponding delays for motorists waiting to turn are used for LOS analysis. Traffic operations at all study intersections were analyzed using procedures and methodologies contained in the Highway Capacity Manual, 2010 Edition (HCM 2010) for calculating delay at intersections.

Roadway Segment Level of Service

Roadway segments were analyzed using methods presented in HCM 2010. A two-lane highway is an undivided roadway with one lane in each direction. Passing a slower vehicle requires use of the opposing lane as sight distance and gaps in the opposing traffic stream permit. As volumes and geometric restrictions increase, the ability to pass decreases and platoons form. Motorists in platoons are subject to delay because they are unable to pass. The HCM divides these roadways into three types: Class I, Class II and Class III. They are defined as follows:

Class I two-lane highways are highways where motorists expect to travel at relatively high speeds. Two-lane highways that are major intercity routes, primary connectors of major traffic generators, daily commuter routes, or major links in state or national highway networks are generally assigned to Class I. These facilities serve mostly long-distance trips or provide the connections between facilities that serve long-distance trips.

- Class II two-lane highways are highways where motorists do not necessarily expect to travel at high speeds. Two-lane highways functioning as access routes to Class I facilities, serving as scenic or recreational routes (and not as primary arterials), or passing through rugged terrain (where high-speed operation would be impossible) are assigned to Class II. Class II facilities most often serve relatively short trips, the beginning or ending portions of longer trips, or trips for which sightseeing plays a significant role.
- Class III two-lane highways are highways serving moderately developed areas. They may be portions of a Class I or Class II highway that pass through small towns or developed recreational areas. On such segments, local traffic often mixes with through traffic, and the density of unsignalized roadside access points is noticeably higher than in a purely rural area. Class III highways may also be longer segments passing through more spread-out recreational areas, also with increased roadside densities. Such segments are often accompanied by reduced speed limits that reflect the higher activity level.

Additional detail regarding roadway segment analysis methodology is provided in Appendix G of this Draft SEIR. Table 4.11-2 displays the criteria used to determine each LOS category for roadway segments.

105	Class I H	ighways	Class II Highways	Class III Highways
LOS	ATS (mi / hr) PTSF (%)		PTSF (%)	PFFS (%)
А	>55	≤35	≤40	>91.7
В	>50-55	>35-50	>40-55	>83.3 - 91.7
С	>45-50	>50-65	>55-70	>75.0 - 83.3
D	>40-45	>65-80	>70-85	>66.7 – 75.0
E	≤40	>80	>85	≤66.7

Table 4.11-2 Roadway Segments LOS Definitions

Notes: LOS = Level of Service, ATS = Average Travel Speed, PTSF = Percent Time Spent Following, PFFS = Percent of Free-Flow Speed

Source: Transportation Research Board 2010

EXISTING INTERSECTION OPERATIONS

Table 4.11-3 summarizes existing LOS at the study area intersections during AM and PM peak hours. Saturday peak hour LOS was also calculated along the SR 113 intersections and at the Hay Road / Project Entrance intersection. Sunday traffic was reviewed at the project site and was consistently lower than Saturday traffic; therefore, the weekend analysis included only Saturday. All intersections except for the SR 12 / SR 113 intersection currently operate at LOS C or better. The SR 12/ SR 113 intersection operates at LOS E in the AM peak hour and LOS F in the PM peak hour. This intersection meets the peak hour signal warrant in the AM peak hour. Caltrans has an identified safety improvement at this intersection which will construct a single lane roundabout. This project is identified for completion in the fall 2019.

Location	Control	Existing AM Peak Hour		Existing PM Peak Hour		Existing Saturday Peak Hour		Peak Hour
Location	Control	LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	Warrant Met?
I-80 Westbound Ramps / Oday Rd	Westbound							No
Southbound Left	Stop	А	6.7	А	7.5			
Westbound		В	10.3	А	9.6			
Midway Road/ Oday Rd	Southbound							No
Southbound	Stop	В	11.0	А	9.8			
Eastbound Left		А	7.8	А	7.6			
I-80 Eastbound Ramps / Midway Rd	Northbound							No
Northbound	Stop	В	13.0	В	12.2			
Eastbound Left		А	8.1	А	8.1			
Midway Rd / Porter Rd	Westbound							No
Westbound	Stop	А	9.0	А	8.8			
SR 113 / Midway Rd	Eastbound/							No
Northbound Left	Eastbound	А	7.7	А	7.6	А	7.5	
Southbound Left	Stop	А	7.5	А	7.6	А	7.4	
Eastbound		В	13.7	В	12.0	В	10.5	
Westbound		В	11.4	В	13.7	А	9.9	
SR 113 / Hay Rd	Eastbound							No
Northbound Left	Stop	А	7.6	А	7.8	А	7.5	
Eastbound		В	10.6	В	12.1	А	9.5	
SR 113 / SR 12	Northbound /							Yes
Northbound	Southbound	С	24.1	С	17.8	В	12.0	
Southbound	Stop	E	38.8	F	373.3	С	20.5	
Eastbound Left		А	0.0	А	8.6	А	8.6	
Westbound Left		А	7.8	А	9.3	А	7.9	
Hay Rd / Project Entrance	Northbound							No
Northbound	Stop	А	9.2	А	9.1	А	9.0	
Westbound Left		А	7.4	А	7.3	А	7.4	

Table 4.11-3 Existing Peak Hour Levels of Service at Intersections

Notes: LOS = Level of Service

Source: KDA 2018

EXISTING ROADWAY SEGMENT OPERATIONS

Table 4.11-4 summarizes the study roadway segment LOS based on the existing traffic volumes and roadway configuration. Applicable LOS thresholds and roadway classifications are presented. The LOS along Midway Road, SR 113, and Hay Road were analyzed using the HCS two-lane roadway methodology. Study roadway segments along both County study roadways (Midway Road and Hay Road) will operate at LOS C or better while the study roadway segments along SR 113 operate at LOS D or better. Therefore, all study roadway segments are currently operating at acceptable levels.

Roadway	Location	Facility Classification	ATS/PTSF/LOS Existing AM	ATS/PTSF/LOS Existing PM
Midway Rd	I-80 to Porter Rd	Class I Highway		
	Eastbound		46.6 / 42.8 / C	45.9 / 55.0 / C
	Westbound		46.5 / 53.3 / C	46.0 / 49.8 / C
	Porter Rd to SR 113	Class I Highway		
	Eastbound		48.2 / 35.3 / C	50.0 / 13.9 / B
	Westbound		48.0 / 30.5 / C	50.2 / 28.1 / B
SR 113	Midway Rd to Fry Rd	Class I Highway		
	Northbound		47.7 / 29.1 / C	45.9 / 36.8 / C
	Southbound		47.5 / 25.0 / C	45.9 / 37.3 / C
	Fry Rd to Hay Rd	Class I Highway		
	Northbound		45.8 / 44.2 / C	44.8 / 46.1 / D
	Southbound		45.6 / 31.7 / C	44.8 / 43.8 / D
	Hay Rd to SR 12	Class I Highway		
	Northbound		46.1 / 48.2 / C	44.9 / 45.3 / D
	Southbound		45.7 / 30.5 / C	44.9 / 50.4 / D
Hay Rd	SR 113 to Daily Rd	Class I Highway		
	Eastbound		49.7 / 24.9 / C	49.5 / 26.4 / C
	Westbound		49.7 / 24.9 / C	49.4 / 15.1 / C

Table 4.11-4 Existing Roadway Segment Levels of Service

Notes: LOS = Level of Service; ATS = average travel speed; PTSF = percent time spent following Source: KDA 2018

4.11.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

Project Elements Affecting Traffic and Transportation

As noted in Chapter 3, "Project Description," the project would amend the existing Land Use Permit (LUP) by allowing up to 3,400 tons of refuse to be delivered to the site, while maintaining an average 7-day average of 3,200 tons per day. The LUP also limits vehicles travelling to and from the landfill and JPO to 620 per day, averaged over a 7-day period. As shown in Table 4-11-5, the current 7-day average of vehicles travelling to and from the landfill so and from the landfill so and from the landfill is less than 500.

During 2017 and 2018, the landfill assisted in the disposal of fire debris from wildfires in Northern California (i.e., emergency conditions), which resulted in the temporary increase in allowable tonnage within the disposal area and additional vehicles travelling to and from the landfill. Table 4.11-5 identifies the annual tonnage received, with and without the fire debris and the number of vehicles travelling to and from the landfill during those periods. Because the acceptance of fire debris was in response to an emergency condition, the additional tonnage received, and trips conducted were not subject to the established limits within the LUP for the landfill. As a result, use of either 2017 or 2018 tonnage data as part of the baseline against which the potential impacts of an amended LUP does not represent the landfill's typical operating condition. Therefore, the 2016 tonnage received, and vehicle trips was determined within the TIA to be the appropriate baseline for the existing landfill against which to assess the potential net growth in vehicles travelling to and from the landfill as a result of the project.

Year	Baseline Tonnage	Baseline Vehicles
2016	1,682	425
2017 (with fire debris)	1,947	471
2018 (with fire debris)	2,083	465

Notes: **Bold** = Baseline Source: KDA 2018 In addition, due to recent import restrictions imposed by China on recyclable materials, baled, single-stream recyclable materials are planned to be temporarily stored at the RHR Landfill site until the restrictions are lifted and/or new markets are developed to accept the material. The landfill site is proposing to store up to 3,680 bales for up to 6 months before being transported to offsite processing facilities. Each truck delivering bales would contain approximately 50 bales. The project applicant proposes to deliver on average five trucks per day and up to twenty trucks on a given day of baled recyclable materials. If deliveries were to occur daily the landfill would reach its storage limit in 4 to 15 days. It is assumed that similar outbound shipments would be made to the processing facilities or buyer, however, the potential destination of the material is not known at this time. Trucks could return to the San Francisco Bay Area along westbound I-80, head east toward Sacramento along eastbound I-80, or head east toward Stockton via SR 12.

Because a reasonable projection of the number of vehicles (591) traveling to the landfill with implementation of the proposed project are not anticipated to exceed the daily vehicle limit (620) evaluated in this analysis, the potential additional truck trips associated with the delivery of bales to the landfill is within the modeling results identified above. A further qualitative assessment was conducted to determine what impacts the addition of five trucks per day would have on the local road system. As noted above the site could be filled in 15 days with no additional storage available until onsite material is shipped offsite. It is expected that the maximum of 20 truck shipments could occur on a rare basis, with the five-truck average being more likely, given the amount of storage space available and the expected storage time. With five trucks delivering recyclables and five trucks hauling recyclables to a processing facility this would add 10 round trip truck trips per day to the roadway network. While delivery and shipping times are unknown Recology has indicated in their Bale Storage Management Plan that they would attempt to avoid peak hours to the extent possible. All bales would be shipped along I-80 with 75 percent of the baled material west of the Midway Road interchange and 25 percent of the baled material east of the interchange. Thus, because the vehicular trips associated with recyclable material storage activities are not anticipated to occur during the peak hours of traffic on the surrounding roadway network, and the additional trips would not occur every day and would be part of the daily fluctuation in traffic, these additional trips were not included as part of the intersection or roadway analyses that follows. For additional details and a qualitative analysis of the impacts of the trips associated with the recyclable material trips, see Appendix G of this Draft SEIR.

Other Considerations

A single lane roundabout is being constructed by Caltrans at the intersection of SR 12, SR 113, and Birds Landing Road to reduce traffic safety issues by streamlining the flow of traffic through the intersection, removing the need for vehicles to cross highways. The intersection improvement project is scheduled for completion in October 2019. The roundabout is funded through the 2014 State Highway Operation and Protection Program (SHOPP), under the Safety Improvements Program, Program Code 201.010 (Caltrans 2016). Therefore, the Existing Plus Project scenario intersection operations modeling assumes the roundabout will be completed and in place before implementation of the project.

Project Trip Generation

The 2016 7-day tonnage averaged approximately 1,682 tons per day. RHR projects that most new municipal solid waste (MSW) associated with the proposed project will arrive from outside the surrounding local areas and would be transported using semitrailer. MSW tonnage arriving to the site is projected as follows:

- ▶ 90 percent via 20-ton transfer trucks,
- ▶ 8 percent via 7-ton packer trucks, and
- ► 2 percent via ½-ton self-haul vehicles.

Table 4.11-6 presents the new projected-generated vehicular trips, broken down by vehicle type, based on the proposed expansion of the site. Both average daily and peak day MSW tonnage to the site were considered. Peak tonnage was based on the difference between the maximum proposed peak tonnage per day (maximum 3,400 tons per day) and the average 2016 weekday tonnage (1,682 tons per day). The project will generate an additional 1,718 tons of MSW on a peak day while the additional average daily MSW will be 1,518 tons per day.

Table 4.11-6Projected Daily Trips*

Average I	Average MSW Tons		Average Daily Tonnage per Week (Proposed)		Maximum Daily Tonnage (Proposed)		Net New Tonnage			ge		
(a)	(b)		(C)		(C)		(d)		(e)			(f)
Weekday	Weekend						Weeko	day		Maximum		
1,682	924		3,200		3,200 3,400		1,518	3 ¹		1,768 ²		
PEAK TONNAGE VEHICLES												
Maximum Daily Tonnage	Transfe 90% of ente (20 tons)	r Trucks ring vehio / vehicle)	icles)	Pac 8% of er (7 to	:ker Trucks ntering vehicle ns / vehicle)	s	Self-Haul vehicles 2% of entering vehicles (0.5 tons / vehicle)		es	Total Vehicles		
(g)	In	Ou	ut	In	Out		In	Out				
1,718 (Inbound)	91 ³			234			81 ⁵			195		
Empty (Outbound)		9	91		23			81		195		

Notes: MSW - municipal solid waste

* Based on 2016 traffic at RHR site	
1 (c) – (a)	4 [(g)*0.08] / 7
2 (d) – (a)	5 [(g)*0.02] / 0.5
3 [(g)*0.90] / 20	
Source: KDA 2018	

As shown in Table 4.11-6, based on the projected additional daily tonnage and the mix of vehicle types bringing MSW to the site it is projected that 195 new inbound and 195 new daily outbound trips will be generated by the project. Of these trips, 91 new semi-trailer trips will be generated, with 23 additional packer trucks and 81 new self-haul vehicles.

Table 4.11-7 presents the projected AM and PM peak hour trips including a breakdown by trip type. On a peak day the project is expected to generate 46 additional AM peak hour trips and 27 additional PM peak hour trips.

Table 4.11-7Projected Peak Hour Trips

Existing Conditions					
Aur Tatel Daily Makielan	ļ A	M	F	PM	
Avg Total Daily vehicles	In	Out	In	Out	
526 vehicles*	69†	53+	3‡	53‡	
Percent Traffic◊	13.1%	10.1%	0.6%	13.1%	
Proj	ect Traffic				
New Deik Wehielen	AM PM				
New Daily vehicles	In	Out	In	Out	
195 vehicles					
Peak Hour Traffic	26♦	20	1	26	
Transfer Truck	12ф	9	1	12	
Packer	3μ	2	0	3	
Self-Haul	11β	8	0	11	
Notes:		•	•	·	

* average entering midweek vehicles

+ existing AM peak hour traffic

◆ (195 daily vehicles* 13.1%) typ.
 ♦ 26*(91/195) typ.

φ 20" (91/19)

‡ existing PM peak hour traffic A dimensional peak hour traffic

◊ directional peak hour traffic / ADT Source: KDA 2018 μ 26*(23/195) typ.

β 26*(81/195) typ.

Total Vehicles

43

Saturday traffic volumes are projected to be similar to mid-week traffic volumes. Table 4.11-8 presents the projected Saturday peak hour trips based on current inbound and outbound peak hour Saturday trips relative to the total daily Saturday trips.

Table 4.11-8 Projected Saturday Daily Trips

Out

g 2

Existing Conditions						
Average Total	In	Out				
459 ve	ehicles	55†	43‡			
Percen	12.0%	9.4%				
Project Traffic						
Transfer Trucks	Packer Trucks	Self-Hau	Vehicles			

Out

24

In

10 5

Out

86

Notes:

+ entering Saturday vehicles

In

11¹

¹ (91 weekday transfer trucks) * 12.0%

² (91 weekday transfer trucks) * 9.4%

* exiting Saturday vehicles
 ⁴ (23 weekday packer trucks) * 9.4%

In

3 3

er trucks) * 9.4% ⁵ (8

³ (23 weekday packer trucks) * 12.0% Source: KDA 2018 ⁵ (81 weekday self-haul) * 12.0%

⁶ (81 weekday self-haul) * 9.4%

Project Trip Distribution

The distribution of project vehicular traffic was determined based on the haul routes for semi-trailer and packer vehicles, and a review of existing traffic counts at the surrounding intersections. Table 4.11-9 displays the trip distribution assumptions used for the analysis of the project.

Davita	Percent of Total Trips					
Route	AM	РМ	Saturday			
	62	46	48			
West on Hay Road	20	30	30			
To / From SR 12 east of SR 113	9	8	10			
To / From SR 12 west of SR 113	0	8	6			
North on SR 113	9	8	6			
Total	100	100	100			

Table 4.11-9 Trip Distribution

Source: KDA 2018

Project Trip Assignment

Traffic generated by the project was assigned to the study roadway system based on the projected distribution percentages. Figure 4.11-2 displays the project generated traffic. Figure 4.11-3 displays the resulting sum of existing AM, PM and Saturday peak hour volumes and project trips at the study intersections for the Existing Plus Project condition.

SIGNIFICANCE CRITERIA

The significance criteria used to evaluate the project-related impacts to transportation under CEQA are based on Appendix G of the CEQA Guidelines, and thresholds of significance adopted by Solano County and Caltrans. Recent amendments to the CEQA Guidelines on December 28, 2018 allow for the removal of LOS as the primary metric for assessing transportation impacts of a project and its replacement with VMT. However, the amendments also allow lead agencies until July 2020 to adopt appropriate thresholds for the evaluation of VMT as the primary metric of transportation impact significance under CEQA. As the County has yet to adopt VMT significance thresholds based on evidence and because lead agencies may tailor the thresholds identified in Appendix G of the CEQA Guidelines to suit the individual agency needs and circumstances, LOS will be used as the primary metric for impact determination in this section.¹

Section 1-4 of the Solano County Road Improvement Standards and Land Development Requirements (2006) states that it is the goal of Solano County to maintain LOS C for roadways segments and intersections. Additionally, all projects shall be designed to maintain LOS C for all Solano County roadway facilities, except where the existing facility currently operates below LOS C, in which case, the project shall be designed such that there will be no decrease in the existing LOS. Caltrans has set a minimum LOS standard of LOS D for roadway segments and intersections in rural areas. Therefore, for the purposes of this analysis an impact is considered significant if implementation of the project would result in any of the following:

Intersections

- traffic generated by the project causes an intersection within Solano County that currently operates (or is projected to operate) at LOS C or better to degrade to LOS D or worse; or
- traffic generated by the project decreases the LOS (i.e., increases delay) at an intersection in Solano County that currently operates (or is projected to operate) at LOS D or worse; or
- traffic generated by the project causes a Caltrans intersection that currently operates (or is projected to operate) at LOS D or better to degrade to LOS E or worse; or
- traffic generated by the project decreases the LOS (i.e., increases delay) at a Caltrans intersection that currently
 operates (or is projected to operate) at LOS E or worse.

Roadway Segments

- traffic generated by the project causes a Solano County roadway segment that currently operates (or is projected to operate) at LOS C or better to degrade to LOS D or worse; or
- traffic generated by the project decreases the LOS (i.e., decreases average travel speed [ATS] and/or increases percent time spent following [PTSF]) along a roadway segment in Solano County that currently operates (or is projected to operate) at LOS D or worse; or
- traffic generated by the project causes a Caltrans roadway segment that currently operates (or is projected to operate) at LOS D or better to degrade to LOS E or worse; or
- traffic generated by the project decreases the LOS (i.e., decreases ATS and/or increases PTSF) along a Caltrans
 roadway segment that currently operates (or is projected to operate) at LOS E or worse.

¹ An evaluation of VMT is presented in Section 4.7, "Greenhouse Gas Emissions" as it relates to the generation of GHG emissions through motor vehicle use.









ISSUES NOT DISCUSSED FURTHER

There are no transit facilities or transit routes within the project study area; and thus, the project would not affect operations of existing transit lines, nor would it degrade access to transit. Therefore, the project would not adversely affect public transit operations. Additionally, implementation of the project would not generate new demand for transit trips; and thus, would not result in demands to transit facilities greater than available capacity. This issue is not discussed further in this SEIR.

There are no bike facilities or pedestrian facilities present within the study area. Therefore, the project would not disrupt any existing or planned bicycle/pedestrian facilities, nor would it create inconsistencies with any adopted plans, guidelines, policies or standards related to bicycle or pedestrian systems. This issue is not discussed further in this SEIR.

The project would not result in the alteration to the existing roadway network; and thus, would not increase hazards because of a design feature. The mix of vehicles generated by the project (i.e., transfer trucks, packer trucks, self-haul vehicles) are generally consistent with the existing vehicle types using the surrounding roadway network to access the project site. Therefore, the project would not increase hazards because of incompatible uses. This issue is not discussed further in this SEIR.

The project would not result in alteration to the existing roadway network, nor would it change or increase the size of vehicles that may travel to and from the project site. Thus, existing emergency access would be maintained, and adequate emergency access would be provided. This issue is not discussed further in this SEIR.

The closest airfield to the RHR Landfill is Travis Airforce Base, located approximately 3.3 miles southwest of the project site. The project would not involve the construction of tall structures such that potential interference with existing flight patterns may occur. Thus, the project would not result in a change in air traffic patterns such that significant physical environmental impacts could occur, nor would it result in the construction and operation of uses within the study area that may be incompatible with the nearby airfield. This issue is not discussed further in this SEIR. With respect to the risk of bird strikes as a result of increased wildlife activity as a result of the project, refer to Section 4.8, "Hazards and Hazardous Materials."

PROJECT IMPACTS AND MITIGATION MEASURES

Potential impacts of the project on the transportation system are evaluated in this section based on the thresholds of significance and analysis results. Mitigation measures are recommended for any identified significant impacts.

Impact 4.11-1: Impacts to Intersection Operations

Implementation of the project would add an estimated 46 AM peak hour, 27 PM peak hour, and 43 Saturday peak hour trips to the roadway network in the study area. Based on the traffic modeling and analysis, all study intersections would operate at acceptable LOS with the addition of project-generated trips. This impact would be **less than significant**.

Existing Plus Project traffic volumes account for the addition of project-generated vehicle trips to the existing volumes in accordance with the trip distribution previously presented. Figure 4.11-3 displays the resulting AM, PM, and Saturday peak hour intersection traffic volumes under Existing Plus Project conditions

Table 4.11-10 displays the AM, PM, and Saturday peak period LOS at each study intersection under Existing Plus Project conditions. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations.

		Existing Plus Peak	s Project AM Hour	Existing Plus Peak	s Project PM Hour	Existing P Saturday	lus Project Peak Hour	Peak Hour
Location	Control	LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	Warrant Met?
I-80 Westbound Ramps / Oday Rd Southbound Left Westbound	Westbound Stop	A B	7.7 10.3	A A	7.5 9.6			No
Midway Road / Oday Rd Southbound Eastbound Left	Southbound Stop	B A	11.1 7.8	A A	9.8 7.6			No
I-80 Eastbound Ramps / Midway Rd Northbound Eastbound Left	Northbound Stop	B A	13.2 8.2	B A	12.4 8.1			No
Midway Rd / Porter Rd Westbound	Westbound Stop	A	9.1	A	8.9			No
SR 113 / Midway Rd Northbound Left Southbound Left Eastbound Westbound	Westbound Stop/ Eastbound Stop	A A B B	7.7 7.5 14.3 11.8	A A B B	7.7 7.6 12.3 14.2	A A B B	7.5 7.4 10.5 10.0	No
SR 113 / Hay Rd Northbound Left Eastbound	Eastbound Stop	A B	7.6 11.2	A B	7.8 12.5	A A	7.5 9.9	No
SR 113 / SR 12	Roundabout	А	7.1	С	19.1			N/A
Hay Rd / Project Entrance Northbound Westbound Left	Northbound Stop	A	9.5 7.4	A	9.3 7.3	A	9.2 7.4	No

Table 4.11 10 Existing LOST each four Levels of Service at Intersection	Table 4.11-10	Existing PLUS Peak Hour Levels of Service at Intersections
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Notes: LOS = Level of service, SR = State Route

Source: KDA 2018

As shown in Table 4.11-10, all intersections would operate at acceptable LOS (i.e., LOS C or better for Solano County intersections, LOS D or better for Caltrans intersections) with the addition of project-generated trips to the study intersections under Existing Plus Project conditions. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.11-2: Impacts to Roadway Segment Operations

Implementation of the project would add an estimated 46 AM peak hour and 27 PM peak hour trips to the roadway network in the study area. Based on the traffic modeling and analysis, all study roadway segments would operate at acceptable LOS with the addition of project-generated trips. This impact would be **less than significant**.

Table 4.11-11 displays the results of the AM and PM peak hour roadway segment operations analysis for each of the six study roadway segments. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations.

Deedaara	l a cation		ATS/PTSF/LOS	ATS/PTSF/LOS
Roadway	Location	Facility Classification	Existing Plus Project AM	Existing Plus Project PM
Midway Rd	I-80 to Porter Rd Eastbound Westbound	Class I Highway	46.4 / 45.4 / C 46.3 / 55.3 / C	45.8 / 55.6 / C 45.9 / 51.3 / C
	Porter Rd to SR 113 Eastbound Westbound	Class I Highway	47.9 / 37.5 / C 47.6 / 32.3 / C	49.8 / 13.3 / C 50.1 / 29.6 / B
SR 113	Midway Rd to Fry Rd Northbound Southbound	Class I Highway	47.2 / 31.0 / C 47.0 / 28.1 / C	45.7 / 38.5 / C 45.7 / 37.7 / C
	Fry Rd to Hay Rd Northbound Southbound	Class I Highway	45.3 / 45.3 / C 45.3 / 34.0 / C	44.7 / 47.8 / D 44.7 / 44.1 / D
	Hay Rd to SR 12 Northbound Southbound	Class I Highway	46.0 / 48.5 / C 45.7 / 30.9 / C	44.8 / 45.0 / D 44.8 / 50.7 / D
Hay Rd	SR 113 to Daily Rd Eastbound Westbound	Class I Highway	49.0 / 27.2 / C 49.0 / 21.8 / C	49.3 / 29.3 / C 49.2 / 13.1 / C

Table 4.11-11	Existing Plus Project Roadway Segment Levels of Service
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Notes: ATS = average travel speed, PTSF = percent time spent following, LOS = Level of service, SR = State Route

Source: KDA 2018

As shown in Table 4.11-11, all Solano County study roadway segments would operate at LOS C or better during the AM and PM peak hours. Additionally, all Caltrans study roadway segments (i.e., roadway segment along SR 113) would operate at LOS D or better during the AM and PM peak hours. Therefore, all study roadway segments would operate at acceptable LOS during both the AM and PM peak hours with the addition of project generated traffic under Existing Plus Project conditions. Thus, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 4.11-3: Impacts to Local Roadways

Operation of the project could cause additional damage to local roadways within the vicinity of the landfill. Compliance with the Road and Litter Agreement between Recology and Solano County would ensure that any additional road damage caused by facility operations are paid for by RHR. Therefore, this impact would be **less than significant**.

The existing agreement between the County and RHR requires the facility operator to pay for road damage caused by their operations (2016 RHR Road and Litter Agreement), and this agreement is updated periodically based on road conditions. If any additional road damage associated with the proposed increase in truck trips occurred, the terms of the existing agreement would continue to govern and RHR would be responsible for the repair of landfill-related road damage. Thus, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

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5 CUMULATIVE IMPACTS

5.1 INTRODUCTION TO THE CUMULATIVE ANALYSIS

Section 15130 of the State of California Environmental Quality Act (CEQA) Guidelines requires that an environmental impact report (EIR) discuss cumulative impacts of a project and determine whether the project's incremental effect is "cumulatively considerable." "Cumulative impacts" under CEQA Guidelines Section 15355 are referred to as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." "Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines Section 15355(b)).

The definition of cumulatively considerable is provided in Section 15065(a)(3):

"Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

According to Section 15130(b) of the State CEQA Guidelines,

[t]he discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

For purposes of this Subsequent EIR (SEIR), the project would have a significant cumulative effect if it meets either one of the following criteria:

- the cumulative effects of related projects (past, current, and probable future projects), including the approved Recology Hay Road (RHR) Landfill project but without this project, are not significant but the project's incremental impact is substantial enough, when added to the cumulative effects, to result in a significant impact; or
- the cumulative effects of related projects (past, current, and probable future projects), including the approved RHR Landfill project, without this project are already significant and the project represents a considerable contribution to the already significant effect. The standards used herein to determine "considerable contribution" are that the impact either must be substantial or must exceed an established threshold of significance.

Mitigation measures are to be developed, where feasible, that reduce the project's contribution to cumulative effects to less than considerable.

5.2 RELATED PROJECTS

The analysis of cumulative environmental impacts associated with development of the proposed project addresses the potential incremental impacts of the project in combination with those of other past, present, and probable future projects and land use changes in the project vicinity or of regional significance. The projects listed in Table 5-1 (correlated with their locations in Figure 5-1) are not intended to be an all-inclusive list of projects in the region, but rather an identification of projects constructed, approved, or under review in the vicinity of the RHR Landfill that have some relation to the environmental impacts of construction and operation of the proposed project. The list of projects used in this cumulative analysis is based on information for approved and pending projects obtained from Solano County, District 4 of the California Department of Transportation (Caltrans), City of Dixon, City of Vacaville, and the University of California at Davis (UC Davis).

Table 5-1 List of Projects in the Vicinity of the Propo	osed RHR Landfill Project
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Map Key	Project Name	Developed or Proposed Land Use	Size (Acreage and/or Dwelling Units)	Built/Approved/ Proposed
Caltran	s, District 4-Solano			· · ·
1	SR 12 Rio Vista Bridge Preservation Project	Road ROW	Cleaning, painting, and upgrade of the mechanical and electrical systems at the drawbridge on State Highway 12 over the Sacramento River in Rio Vista	Under Construction through 2020
2	SR 12 / SR 113 intersection safety project	Road ROW	Construction of a single lane roundabout at this intersection	Under review.
3	1-8-/I-680/SR-12 Interchange Project	Road ROW	Realignment of I-680, an improved direct connector route between I-80 and Highway 12, construction of new interchange overcrossings, new entrance/exit ramps, and the extension of some local streets leading to I-80 and Highway 12	Under Construction
Solano	County			
4	Hay Road Improvements Project	Road ROW	Construction of 4-foot paved shoulders on Hay Road from Lewis Road to SR-113	Under Review
Solano	Transportation Authority			
5	Jepson Parkway Project	Road ROW	Improvements to a series of narrow local roads to provide a north-south travel route as an alternative to I-80, including a continuous four-lane roadway from the State Route 12 / Walters Road intersection in Suisun City to the I-80 / Leisure Town Road interchange in Vacaville	Approved
City of	Dixon			
6	Valley Glen Planned Development	Residential Development	Approximately 93 acres of several housing types including apartment units, cluster homes with two or three units per building, medium-density detached single-family homes, and low-density homes	Approved
7	Southwest Dixon Specific Plan	Mixed-Use	269-acres with 61% being zoned for residential use and the remainder for commercial and public facilities	Approved
8	Parklane Subdivision Planned Development	Mixed-Use	94-acre residential community with 40-acres a new high school and infrastructure	Under construction
City of	Vacaville	1		
9	Downtown Specific Plan	R&D/Light industrial	150-225,000-sf R&D/light industrial development	Proposed
10	North Village Specific Plan- PA 19 & 20	Residential	295-unit single-family subdivision on 175.7 acres	Approved
11	Rice-McMurtry Development Area	Residential	221 single-family lots on 150 acres (Cheyenne Planned Development); 21 single-family lots and open space on 22.66 acres (Knoll Creek Planned Development); 29 single-family lots on 12.97 acres (Rogers Ranch Planned Development); and 38 residential lots on 20.93 acres (Reserve at Browns Valley)	Approved

Map Key	Project Name	Developed or Proposed Land Use	Size (Acreage and/or Dwelling Units)	Built/Approved/ Proposed
12	Nut Tree Apartments	Residential	12-acre development with 216 apartment units	Under Construction
13	Nut Tree Business Park	Business Park	175,000 sq. ft. of additional office space	Approved
14	The Green Tree	Mixed-Use	Redevelopment of former golf course with commercial, residential, and recreational uses	Under Review
15	The Farm at Alamo Creek	Residential/Neighborhood Commercial/Parks/Public Open Space	210.5-acre site with 746 units, 7.4 acres of neighborhood commercial, and 26.8 acres of recreation (parks, public open space, and trails)	Under Review
16	Brighton Landing Specific Plan	Residential/School/Park	217-acre development with approximately 770 single-family homes, a 50-acre private high school, a public elementary school site, and a park.	Approved
17	Robert's Ranch Specific Plan	Residential/Parks/Public Open Space	248-acre development with 785 single-family units, parks/open space lands, and a school site.	Approved
18	Southtown Planned Development Phase 1A	Residential	141-lot single family subdivision on 33 acres.	Under construction
19	Lower Lagoon Valley	Residential/Mixed- Use/Recreation	868-acre development with 1,025 residential units, 60 acres of business retail and mixed- use Town Center, a fire station, over 450 acres of open space/recreation/mitigation lands, and a golf course	Approved
20	Vanden Meadows – Vanden Estates Villages A & B House Plans	Residential/School/ Park	463 residential units on 97.6 acres (Villages) and 176 units on 75.11 acres (Estates) with a school site and park.	Approved
UC Davis				
21	UC Davis 2018 Long Range Development Plan	Academic buildings and Student housing	2,000,000 sf of new academic/administrative space and ~9,000 new beds for students within existing university property	Approved

Source: Data compiled by Ascent Environmental in 2019 based on data obtained from Caltrans, Solano County; Solano Transportation Authority, City of Dixon, City of Vacaville, University of California at Davis (UC Davis);


5.3 GEOGRAPHIC SCOPE OF THE CUMULATIVE ANALYSIS

The geographic area that could be affected by development of the proposed project varies depending on the type of environmental resource being considered. The general geographic area associated with various environmental effects of construction and operation of the proposed project defines the boundaries of the area used for compiling the list of projects considered in the cumulative impact analysis. Table 5-2 presents the general geographic areas associated with the different resources addressed in this Draft SEIR and evaluated in those sections of this cumulative analysis.

Resource Issue	Geographic Area
Aesthetics	Local (immediate project vicinity)
Air Quality	Regional (Yolo and Bay Area Air Quality Management District—pollutant emissions that have regional effects) Local (immediate project vicinity—pollutant emissions that are highly localized)
Archaeological, Historic, and Tribal Cultural Resources	Regional
Biological Resources	Regional
Geology, Soils, and Mineral Resources	Local (immediate project vicinity)
Greenhouse Gas Emissions/Climate Change	Global
Hazards and Hazardous Materials	Local (immediate project vicinity)
Hydrology and Water Quality	Local (immediate project vicinity—local watershed)
Noise	Local (immediate project vicinity—effects are highly localized)
Transportation	Regional and local

Table 5-2	Geographic	Scope of	f Cumulative	Impacts
	Geographic	Scope of	camalative	mpaces

Source: Data compiled by Ascent Environmental in 2019

5.4 ANALYSIS OF CUMULATIVE IMPACTS

5.4.1 Aesthetics

Development of past, present, and probable future projects continue to alter the visual environment in Solano County and the nearby cities of Dixon and Vacaville. However, in general, the visual resource impacts of the related projects are site-specific and would not combine with other projects because they are not in the same viewshed as the RHR Landfill to create a cumulative impact. Glare from nighttime lighting can be an annoyance to nearby residences and can reduce the quality of nighttime views. Nighttime lighting can also cause skyglow, an overall brightening of the night sky, often in urban areas, which is a cumulative condition. The project would be located within the existing landfill site, which is remote and is primarily surrounded by agricultural lands with the nearest residence being located one mile away. Implementation of Mitigation Measure 4.1-1 would address any addition of windblown litter that could result from increased truck trips and expansion of the landfill. The existing cumulative visual quality of the surrounding viewshed is moderately low and there are few existing sources of nighttime lighting in the project vicinity. The area surrounding the landfill is zoned for agricultural uses with limited development expected to occur in the project vicinity and no projects anticipated, with the exception of proposed improvements to Hay Road, currently proposed for the immediate project vicinity. The proposed project would not result in new sources of fixed lighting and would not involve the construction of additional structures that could substantially alter long-distance views, glare, or night-lighting. Therefore, while the proposed project would result in long-term changes in the immediate viewshed including landfill modules within the Triangle, the proposed project would not result in a substantial contribution to a significant cumulative impact related to long distance views.

With project-specific mitigation, the project would implement litter control measures that would minimize the potential for additional windblown litter resulting from project implementation. The proposed project, in combination with cumulative

development, would not make a considerable contribution to skyglow in the project vicinity because lighting currently exists onsite and, with the exception of occasional portable nighttime lighting use that is consistent with the landfill's light control program, no additional sources of lighting or glare are included as part of the project. While the proposed project would result in changes in the immediate viewshed, there would be no significant contribution to cumulative long distance views. Therefore, the project would not result in a considerable contribution to a significant cumulative visual resources impact, and the impact would be **less than significant**

5.4.2 Air Quality

SHORT-TERM CONSTRUCTION-RELATED IMPACTS

As noted in Section 4.2, "Air Quality," the Yolo Solano Air Quality Management District (YSAQMD) has established a significance threshold of 80 pounds per day (lb/day) for emissions of respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM₁₀) and 10 tons per year (tons/year) for emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X), which are ozone precursors. YSAQMD acknowledges that the entire Sacramento Valley Air Basin (SVAB) violates state and federal ambient air quality standards for ozone and particulate matter (PM₁₀ and PM_{2.5}) because of the combined levels of emissions generated by sources throughout the SVAB, including but not limited to the projects listed in Table 5-1. YSAQMD considers emissions of ROG and NO_X (both ozone precursors) and PM₁₀ from an individual project that exceed the applicable thresholds to be a substantial contribution to this SVAB-wide (i.e., cumulative) impact (YSAQMD 2007:7). As construction emissions associated with the project would not exceed YSAQMD thresholds, the project would not result in a substantial contribution to a cumulative impact.

Emissions of ROG, NO_x, and PM₁₀ generated during construction of the project would be less than YSAQMD's applicable mass emission thresholds and, therefore, the contribution by project construction to the nonattainment condition would not be cumulatively considerable. Therefore, the project would result in a **less-than-significant** cumulative short-term construction-related emissions impact.

LONG-TERM OPERATIONAL IMPACTS

YSAQMD's mass emission thresholds for criteria air pollutants and precursors do not apply to emissions directly generated by stationary sources, including the increase in emissions in landfill gas and emissions generated by the Construction and Demolition Sorting Operation. In its CEQA guidance, YSAQMD states that "stationary sources complying with applicable [YSAQMD] regulations pertaining to Best Available Control Technologies (BACT) and offset requirements usually will not be considered a significant air quality impact. Due to the air basin-wide nature of these impacts, it if inferred that stationary-source emissions meeting all YSAQMD permitting requirements would not be cumulatively considerable.

As discussed under Impact 4.2-2, most of the increase in project-related vehicle travel would occur in the San Francisco Bay Area Air Basin (SFBAAB) and in the jurisdiction of the Bay Area Air Quality Management District (BAAQMD). BAAQMD has established a significance threshold of 54 pounds per day (lb/day) for emissions of ROG and NO_x, which are ozone precursors, and for PM_{2.5}; and 82 lb/day for PM₁₀; and 10 tons/year for emissions of ROG, NO_x, and PM_{2.5}; and 15 tons/year for PM₁₀. BAAQMD acknowledges that the entire BAAB violates state and federal ambient air quality standards for ozone and particulate matter (PM₁₀ and PM_{2.5}) because of the combined levels of emissions generated by sources throughout the SFBAB, including but not limited to the projects listed in Table 5-1. BAAQMD considers emissions of ROG and NO_x (both ozone precursors) and PM10 from an individual project that exceed the applicable thresholds to be a substantial contribution to this SVAB-wide (i.e., cumulative) impact (BAAQMD 2017:2-3).

Operational emissions of ROG, PM_{10} , and $PM_{2.5}$ would be less than BAAQMD's applicable mass emission thresholds; however, operational NO_X emissions before 2023 would exceed applicable BAAQMD thresholds. Implementation of

Mitigation Measure 4.2-2, which includes multiple ways to reduce NO_X emissions, would reduce NO_X emissions to below BAAQMD thresholds.

The BAAQMD is designated as nonattainment with respect to the ambient air quality standards for ozone, PM₁₀, and PM_{2.5}. This is a result of past cumulative development in the basin, as well as transport of pollutants from other basins. New development, including operation of the project would be required to comply with BAAQMD measures that would reduce operational emissions of criteria pollutants and precursors. As described above, the cumulative contribution of the project to regional ROG, NO_X, and PM₁₀ emissions (see Section 4.2, "Air Quality"), would not be considerable because emissions from the project would be below BAAQMD's applicable thresholds, with mitigation, and these thresholds are targeted toward cumulative emissions impacts.

Residential receptors located along local haul routes could be exposed to relatively high concentrations of diesel PM used by heavy diesel trucks traveling to and from the landfill—this is addressed in Impact 4.2-3. This impact is associated with adding TAC-emitting truck travel near existing residents and is site specific. Impacts associated with this TACs on the site would not combine with other developments to create more substantial cumulative TAC impacts; therefore, this impact would not be considered cumulatively considerable.

Emissions from stationary sources for related projects would be regulated through YSAQMD's permitting process. YSAQMD's thresholds of significance are set at a level that avoids a potential conflict with air quality attainment plans, which are required to reach attainment of federal and state air quality standards. Consequently, the long-term operation of the project would not result in a substantial contribution to a cumulative increase in regional emissions (the projected emissions inventory for the SVAB) that would conflict with the emissions budget used by YSAQMD for regional air quality planning (i.e., YSAQMD's air quality attainment plans).

As discussed in Impact 4.2-4, the addition of baled recyclables and increase in municipal solid waste processed and landfilled at the project site as expansion occurs is not expected to result in additional sources or objectionable odors nor increased intensity of odors. Additionally, the area of landfill expansion is further away from the nearest offsite sensitive receptors than the portions of the landfill that are currently being filled. Any odors associated with proposed storage of baled recyclables would be addressed with implementation of the nuisance and odor control measures described in the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018 (see Appendix B of this SEIR). These measures are also described in Chapter 3, Project Description, of this Draft SEIR.

With project-specific mitigation, the project would generate emissions that are less than YSAQMD and BAAQMD thresholds for emissions from an individual project, which were established to reach attainment with air quality standards in the SVAB and SFBAAB, respectively. The project's long-term operational emissions would not considerably contribute emissions which would exceed applicable air quality standards. Therefore, operational emissions generated by the project would result in a **less-than-significant** cumulative air quality impact.

5.4.3 Archaeological, Historic, and Tribal Cultural Resources

The cumulative context for the archaeological resources and tribal cultural resources (TCRs) analysis considers a broad regional system of which the resources are a part. The cumulative context for archaeological resources and TCRs for this project includes Solano County and the Patwin territory as described in Section 4.3, "Archaeological, Historical, and Tribal Cultural Resources" of this SEIR.

Because all significant cultural resources are unique and nonrenewable members of finite classes, meaning there are a limited number of significant cultural resources, all adverse effects erode a dwindling resource base. The loss of any one archaeological site could affect the scientific value of others in a region because these resources are best understood in the context of the entirety of the cultural system of which they are a part. The cultural system is represented archaeologically by the total inventory of all sites and other cultural remains in the region. As a result, a meaningful approach to preserving and managing cultural resources must focus on the likely distribution of cultural resources, rather than on a single project or parcel boundary.

Implementation of the project, in combination with other past, present, and probable future development within the Patwin territory and Solano County, would involve ground-disturbing activities that could further result in discovery of or damage to previously undiscovered archaeological and TCRs as defined in State CEQA Guidelines Section 15064.5 and PRC Section 21074, respectively, within the cumulative context. Proper planning and appropriate mitigation can help to capture and preserve knowledge of such resources and can provide opportunities for increasing our understanding of cultures and past environmental conditions by recording data about sites discovered and preserving artifacts found. Federal, state, and local laws are also in place that protect these resources in most instances. Even so, it is not always feasible to protect these resources, particularly when preservation in place would make projects infeasible, and for this reason the cumulative effects of past, present, and probable future projects could result in a potentially significant cumulative impact on cultural resources. However, compliance with existing federal and State regulations, as well as implementation of Mitigation Measure 4.3-1 and 4.3-2, would ensure that the project's contribution would not be cumulatively considerable by requiring construction work to cease with subsequent evaluation and treatment in the event of an accidental find of a potential resource.

Compliance with California Health and Safety Code Sections 7050.5 and 7052 and California Public Resources Code (PRC) Sections 5097, 21080.3.2, and 21084.3 (a), as well as implementation of Mitigation Measures 4.3-1 and 4.3-2, would ensure that treatment and disposition of unique archaeological resources are handled by a professional archaeologist, qualified under the Secretary of the Interior's Professional Qualification Standards, and TCRs, including human remains, occurs in a manner consistent with the California Native American Heritage Commission guidance. As a result, the project's contribution to cumulative impacts would not be cumulatively considerable. Therefore, cumulative impacts related to archaeological and tribal cultural resources are considered **less than significant**.

5.4.4 Biological Resources

Past development in the region, ranging from conversion of natural land to agricultural production to more recent expansion of urban development, has resulted in a substantial loss of native habitat to other uses. This land conversion has benefited a few species, such as those adapted to agricultural uses, but the overall effect on native plants, animals, and habitat has been decidedly negative. Therefore, the cumulative condition for special-status species and sensitive habitats is already adverse.

As described in Section 4.4, "Biological Resources," project implementation could result in potentially significant impacts on special-status plants (discussed under Impact 4.4-1); and several special-status wildlife species (Impact 4.4-2), wetland or vernal pool habitat (Impact 4.4-3), and high-priority habitat areas identified in the Solano County General Plan (Impact 4.4-5). However, these potential impacts would be mitigated to a less-than-significant level with implementation of the mitigation measures described in Section 4.4, "Biological Resources." Similarly, impacts to sensitive habitats (i.e., vernal pools, aquatic habitat) resulting from project implementation would be reduced through required identification, avoidance, and/or permitting requirements by regulatory agencies with jurisdiction. Therefore, the project's incremental contribution to the cumulative impact on special-status species and habitats in the region is considered less than significant.

The proposed project could disturb areas that include special-status plant species, vernal pools, and habitat for specialstatus species, which are considered significant impacts without mitigation. However, with implementation of Mitigation Measures 4.4-1a through 4.4-1c, 4.4-2a through 4.4-2g, and 4.4-3, as described in Section 4.4, "Biological Resources" of this SEIR, the project's contribution to these impacts would be reduced to a less-than-significant level. Therefore, while the overall cumulative condition is adverse, the project's contribution to cumulative biological resource impacts would not be considerable, and the project would have a **less-than-significant** cumulative impact on biological resources.

5.4.5 Energy

The project would not increase the demand for electricity and natural gas supplies; therefore, this cumulative analysis is limited to an evaluation of potential impacts related to fuel consumption. The cumulative context for such energy usage is Solano County. While the project would increase fuel consumption as a result of increased solid waste

generation, primarily within the Bay Area, it would not result in the wasteful or inefficient usage of such fuel supplies. As note under Impact 4.5-1 of this Draft SEIR, the projected increase in solid waste haul vehicles to and from the RHR Landfill as a result of the project would be primarily transfer trucks, which involve a consolidation of wastes such that they are disposed of in a more efficient manner, including the use of one vehicle versus 2 or more to transport waste to a landfill. Therefore, the proposed project would not result in a considerable contribution to a significant cumulative impact related to fuel consumption.

The project's contribution to cumulative energy demand impacts would not be cumulatively considerable. Therefore, no mitigation measures are necessary to reduce the project's contribution to cumulative impacts to energy. The project would have a *less-than-significant* cumulative impact on energy.

5.4.6 Geology, Soils, Minerals, and Paleontological Resources

A review of the Solano County General Plan (2008a: RS-33) and applicable SMARA mineral land classification reports (Stinson, Manson, and Plappert 1983 Plate 3.2, Dupras 1988) indicate that there are no known mineral resources zones associated with the RHR Property. Therefore, this cumulative analysis is limited to an evaluation of potential impacts related to geology, soils, and paleontological resources.

While the landfill is located in the general proximity of several active and potentially active faults, the project site is not located within an Alquist-Priolo Special Studies Zone. All project features would be designed, engineered, and constructed in conformance with applicable codes and standard engineering practices to minimize potential damage from seismic hazards and expansive soils. Because applicable codes and standards would continue to be followed and the project site is not subject to substantial risk of surface fault rupture or expansive soils, the project, in combination with past, present, and probable future projects, would not be considered cumulatively considerable with respect to seismic hazards.

Although the project site is located in an area where natural topography is generally flat, slope stability of engineered landfill slopes must be evaluated for compliance with Title 27 of the of the California Code of Regulations (CCR). Topography within the landfill has been substantially altered and is dominated by the landfill mounds within the central and eastern portion of the site. Although the original site ground surface ranged from approximately 18 to 30 feet above mean sea level (Golder 2018), very little of the original topography within the landfill boundary remains, other than small drainage swales and small mounds and slight depressions. The topography of the Triangle area is generally flat and has not been altered. Effects on the landfill's topography are associated with above-ground activities at the landfill, such as excavation and filling. The native materials underlying the RHR Property consist of silty clay and clayey sand that typically are not susceptible to landsliding, lateral spreading, subsidence, liquefaction, or collapse (Douglas Environmental 2012: 2-29). The existing and proposed uses at the landfill would continue to meet the requirements of Title 27 of the CCR which requires that Class III municipal solid waste landfills be evaluated for slope stability. Because these requirements would be met, activities associated with the proposed project would not combine in such a way that would result in a cumulatively significant impact related to soils and slope stability.

With respect to paleontological resources, all unique paleontological resources are unique and nonrenewable members of finite classes, meaning there are a limited number of unique paleontological resources. As a result, all adverse effects to such resources erode a dwindling resource base. A meaningful approach to preserving and managing unique paleontological resources must focus on the likely distribution of unique paleontological resources, rather than on a single project or parcel boundary. Implementation of the project, in combination with other past, present, and probable future development within Solano County, would involve ground-disturbing activities on land underlain by geologic units known to be highly sensitive for paleontological resources that could further result in discovery of or damage to previously undiscovered paleontological resources within the cumulative context. Proper planning and appropriate mitigation can help to capture and preserve knowledge of such resources and can provide opportunities for increasing our understanding of unique paleontological resources by recording data about sites discovered and preserving fossil remains found. It is not always feasible to protect these resources, particularly when preservation in place would make projects infeasible, and for this reason the cumulative effects of past, present, and

probable future projects could result in a potentially significant cumulative impact on unique paleontological resources.

Because of the site-specific nature of geology, soils, and paleontological impacts and necessary compliance with uniform site development standards, construction standards, and County standards, as well as implementation of Mitigation Measure 4.6-1, the proposed project would not result in a considerable contribution to any cumulative impact related to geology, soils, and paleontological resources; the cumulative impact of the project would be **less than significant**.

5.4.7 Greenhouse Gas Emissions

The discussion of GHG emissions associated with the project is described under Impact 4.7-1 in Section 4.7, Greenhouse Gas Emissions and Climate Change" of this SEIR, is inherently a cumulative impact analysis. GHG emissions from one project cannot, on their own, result in changes in climatic conditions; therefore, the emissions from one project must be considered in the context of their contribution to cumulative global emissions. As noted in Impact 4.7-1 of Section 4.7, "Greenhouse Gas Emissions and Climate Change," the project's impact would be less than significant, and thereby the project would not represent a considerable contribution to a cumulative impact.

The analysis under Impact 4.7-1 concludes that the level of GHG emissions associated with implementation of the project would not be substantial or conflict with the state's ability to meet its statewide GHG targets and, therefore, would not be cumulatively considerable. The impact would be **less than significant**.

5.4.8 Hazards and Hazardous Materials

Hazardous materials impacts are site-specific rather than regional in nature. Any hazardous materials uncovered during construction activities would be managed consistent with applicable federal, state, and local laws to limit exposure and clean up the contamination. In addition, the use, storage, transport, and disposal of hazardous materials would be managed in accordance with applicable federal and state requirements to limit risk of exposure. Project construction and operation in combination with other projects would not create a significant hazard to people or the environment through the accidental release of hazardous materials or exposure to landfill gas because of the site-specific nature of the potential impacts, and existing laws and regulations that minimize the risk of exposure. The temporary storage of baled recyclables has the potential to attract more vectors and/or result in a fire hazard; however, the RHR Recyclable Material Bale Management Operations Plan that was approved by the County in April 2018 requires implementation of vector prevention and fire hazard control measures. These measures are described in Chapter 3, Project Description, of this Draft SEIR and the RHR Recyclable Material Bale Management Operations Plan (see Appendix B of this SEIR). With respect to aircraft safety hazards, no new sources of fixed lighting are proposed as part of the project and the landfill's existing bird control programs and lighting standards would continue and be extended within the landfill as part of the project. In addition, the project would not result in an increase in the potential for wildland fire hazards because existing fire suppression and prevention measures would continue to be implemented and the landfill would remain under the responsibility of the Dixon Fire District. Through continuation of existing landfill practices and regulatory compliance as part of the project, the contribution of the project to cumulative impacts would be less than considerable.

Through continued implementation of practices and procedures at the existing landfill, the proposed project would not result in a considerable contribution to a cumulative impact related to hazards or hazardous materials. Cumulative impacts related to hazards and hazardous materials would be *less than significant*.

5.4.9 Hydrology and Water Quality

Cumulative hydrology and water quality impacts are generally limited to the immediate project area and the local watershed. As discussed in Section 4.9, "Hydrology and Water Quality," the new disposal expansion area would be constructed with a composite liner system that includes a leachate collection and removal system that efficiently collects and removes leachate from the landfill. The RHR Landfill currently operates under WDR Order No. R5-2016-

0056 that requires that the landfill comply with requirements of a SWPPP for the site. Additionally, the project applicant would prepare a SWPPP for general construction impacts to water quality before project implementation.

The RHR Landfill is hydrologically isolated such that all stormwater is retained onsite. The landfill includes a groundwater monitoring system that meets the requirements of Title 27. Monitoring Plans are prepared for each disposal module and submitted to the Regional Board for review and approval before operation of a disposal module. The monitoring plans are prepared in compliance with Title 27 and propose groundwater monitoring wells at the points of compliance that allow for the detection of a release from the landfill units. Prior to operation of a new disposal module within the Triangle area, a Monitoring Plan would be required to be approved by the Regional Board. Thus, the expansion area would include an extensive monitoring network that would identify potential groundwater contamination issues before leaving the site. If any potential groundwater contamination issues are discovered, monitoring and corrective action would be implemented to avoid effects on nearby groundwater resources.

While expansion into the Triangle area would require continued dewatering activities at the borrow pit, it is expected that some disposal modules would close before new ones are opened such that the average daily demand for groundwater from the borrow pit would generally be consistent with existing operations. Thus, the proposed expansion would not be cumulatively considerable.

Because of the hydrologically-isolated nature of the existing landfill and the control and monitoring systems that would be expanded as part of the proposed project, construction and operation of the proposed project would not represent a substantial contribution to off-site hydrology and water quality conditions and would not be cumulatively considerable such that a new significant cumulative impact would occur. This would be a **less-than-significant** cumulative impact.

5.4.10 Noise

Cumulative impacts from construction-generated noise could result if other future planned construction activities were to take place in close proximity to the project approximately at the same time and cumulatively combine with construction noise from the project. The area surrounding the landfill is zoned for agricultural uses with limited development expected to occur in the project vicinity and no projects, with the exception of proposed improvements to Hay Road, currently proposed within a mile of the project site. The Hay Road Improvements project is currently under review by the County. Cumulative impacts from construction-generated noise could result if Hay Road improvements are completed at the same time as the landfill project. If construction of the above-mentioned project were to occur simultaneously with construction of the project, it would be the predominant noise source experienced by the nearest sensitive receptor. However, the nearest sensitive receptor is a residence located approximately 1 mile from the project site; therefore, the contribution of project-related construction noise would not be considerable.

Cumulative noise levels could be affected by additional buildout of surrounding land uses from trip-generating projects (see Table 5-1 above), resulting in increases in vehicular traffic and subsequent traffic noise levels along affected roadways. Table 5-3 presents modeled traffic noise levels along affected roadways under cumulative conditions and cumulative-plus-project conditions.

Table 5-3	Summary of Modeled Traffic Noise Levels under Cumulative-No-Project and Cumulative-Plus-
	Project Conditions

Roadway Segment	L _{dn} (dB) at 100 feet from Roadway Centerline					
	Cumulative-No-Project Conditions	Cumulative-Plus-Project Conditions				
Hay Road between Lewis Road and Project Site Entrance ¹	59.9	60.3				
SR 113 between SR 12 and Hay Road	63.9	64.1				
SR 113 between Midway Road and Hay Road	61.8	62.2				
Midway Road between Porter Road and SR 113	61.9	61.9				

Notes: SR = State Route; dB = A-weighted decibels; L_{dn} = day-night average noise level

¹ Traffic noise levels along the segment of Hay Road between Lewis Road and the project site entrance were estimated at a distance of 70 feet from the roadway centerline because this is the distance to the nearest noise-sensitive receptor.

Source: Modeled by Ascent Environmental 2019

As shown in Table 5-3, traffic noise levels along affected roadways under cumulative and cumulative-plus-project conditions would remain below the County's most stringent transportation noise standard of 65 L_{eq} dB. As a result, traffic noise generated from project operations would not contribute to a significant cumulative noise impact.

Because long-term operation of equipment is expected to be similar to operation of equipment under existing conditions, the proposed project would not result in additional noise sources from stationary equipment. Related projects would not cumulatively combine with stationary ambient noise levels at the landfill because noise is typically site specific and dissipates with distance from the source. The future planned projects would not be located close enough to the project site for stationary noise to combine with existing noise levels. Therefore, the project in combination with other projects would not result in a considerable contribution to a significant cumulative noise impact.

Because the incremental contributions of the proposed project during construction and operation is expected to be similar to the existing noise environment and distance to receptors from landfill-related noise sources, the project would not have a cumulatively considerable contribution to any cumulative impact related to noise; therefore, the cumulative impact would be *less than significant*.

5.4.11 Transportation

The potential cumulative transportation impacts of the project were evaluated within the context of future traffic conditions anticipated to occur in this area of Solano County. The most recent Napa-Solano regional travel demand model was used to estimate cumulative traffic conditions in 2030 in the project vicinity. Cumulative volumes along the roadway links were developed using the difference method (i.e., using the project model growth between existing conditions and cumulative conditions and adding this to existing traffic counts.)

CUMULATIVE NO PROJECT INTERSECTION OPERATIONS

Table 5-4 displays the AM, PM, and Saturday peak hour LOS at each study intersection under Cumulative No Project conditions (Figure 5-2).

		Cumulative No Project AM Peak Hour		Cumulative PM Pea	e No Project ak Hour	Cumulative Saturday	Peak Hour	
Location	Control	LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	Warrant Met?
I-80 Westbound Ramps / Oday Rd	Westbound Stop							No
Southbound Left		А	7.9	А	7.6			
Westbound		В	11.2	В	10.1			
Midway Road / Oday Rd	Southbound							No
Southbound	Stop	В	13.3	В	11.2			
Eastbound Left		А	8.1	А	7.9			
I-80 Eastbound Ramps / Midway Rd	Northbound							No
Northbound	Stop	С	16.4	С	16.0			
Eastbound Left		А	8.6	А	8.5			
Midway Rd / Porter Rd	Westbound Stop							No
Westbound		А	9.2	А	9.1			

 Table 5-4
 Cumulative No Project Peak Hour Levels of Service at Intersections

		Cumulative No Project AM Peak Hour		Cumulative PM Pea	No Project ak Hour	Cumulative Saturday	Peak Hour	
Location	Control	LOS	Average Delay (secs)	LOS	Average Delay (secs)	LOS	Average Delay (secs)	Warrant Met?
SR 113 / Midway Rd	Westbound							Yes ¹
Northbound Left	Stop/ Eastbound	А	8.0	А	8.1	А	7.7	
Southbound Left	Stop	А	7.8	А	7.9	А	7.6	
Eastbound		E	38.5	С	23.6	В	13.2	
Westbound		С	16.1	E	46.0	В	11.1	
SR 113 / Hay Rd	Eastbound Stop							Yes ²
Northbound Left		А	8.0	А	8.4	А	7.6	
Eastbound		В	14.1	С	21.2	В	10.7	
SR 113 / SR 12	Roundabout	С	20.8	F	124.4	В	10.4	N/A
Hay Rd / Project Entrance	Northbound							No
Northbound	Stop	А	9.6	А	9.5	А	9.2	
Westbound Left		А	7.4	А	7.5	А	7.4	

Notes: LOS = level of service, SR = State Route, N/A = not applicable

¹ meets peak hour traffic signal warrant (AM and PM)

² meets peak hour traffic signal warrant (PM)

Source: KDA 2018

As shown in Table 5-4, two intersections would operate at unacceptable LOS under Cumulative No Project conditions (Figure 5-2). The SR 113 / Midway Road intersection is projected to operate at LOS E and meet the peak hour signal warrant in the AM peak hour and PM peak hour under Cumulative No Project conditions. Additionally, the SR 12 / SR 113 intersection is projected to operate at a LOS F during the PM peak hour under Cumulative No Project conditions. The SR 113 / Hay Road intersection is projected to meet the peak hour signal warrant in the PM peak hour; however, the intersection would operate at LOS C or better.





CUMULATIVE NO PROJECT ROADWAY SEGMENT OPERATIONS

Table 5-5 displays the AM and PM peak hour LOS along each study roadway segment under Cumulative No Project conditions.

Deedurer	Location		ATS/PTSF/LOS	ATS/PTSF/LOS
коасмау	Location	Facility Classification	2030 AM	2030 PM
Midway Rd	I-80 to Porter Rd Eastbound Westbound	Class I Highway	45.5 / 45.3 / C 45.4 / 62.2 / C	42.6 / 72.3 / D 43.0 / 59.2 / D
	Porter Rd to SR 113 Eastbound Westbound	Class I Highway	46.5 / 44.5 / C 46.7 / 42.3 / C	47.3 / 36.1 / C 47.3 / 39.8 / C
SR 113	Midway Rd to Fry Rd Northbound Southbound	Class I Highway	44.3 / 41.4 / D 43.7 / 53.6 / D	43.5 / 52.8 / D 43.5 / 53.1 / D
	Fry Rd to Hay Rd Northbound Southbound	Class I Highway	42.9 / 59.6 / D 43.1 / 46.6 / D	41.7 / 63.1 / D 41.8 / 60.4 / D
	Hay Rd to SR 12 Northbound Southbound	Class I Highway	43.1 / 63.0 / D 43.4 / 44.2 / D	41.9 / 59.6 / D 41.8 / 65.7 / D
Hay Rd	SR 113 to Daily Rd Eastbound Westbound	Class I Highway	49.2 / 16.6 / C 49.2 / 29.3 / C	49.0 / 36.7 / C 48.6 / 7.9 / C

 Table 5-5
 Cumulative No Project Roadway Segment Levels of Service

Notes: ATS = average travel speed, PTSF = percent time spent following, LOS = Level of service, SR = State Route

Source: KDA 2018

As shown in Table 5-5, all roadway segments except for the Midway Road segment between I-80 and Porter Road are projected to operate at acceptable levels (i.e., LOS C or better for Solano County roadway segments, LOS D or better for Caltrans roadway segments) under Cumulative No Project conditions. The LOS along Midway Road between I-80 and Porter Road is projected to operate at unacceptable levels (i.e., LOS D) in the PM peak hour in both eastbound and westbound directions under Cumulative No Project conditions.

CUMULATIVE PLUS PROJECT INTERSECTION OPERATIONS

Cumulative Plus Project traffic volumes account for the addition of project-generated vehicle trips to the Cumulative No Project scenario traffic volumes. Figure 5-3 displays the resulting AM, PM, and Saturday peak hour intersection traffic volumes under Cumulative Plus Project conditions.

Table 5-6 displays the AM, PM, and Saturday peak period LOS at each study intersection under Cumulative No Project and Cumulative Plus Project conditions, and the increase in delay at the study intersections as a result of project implementation. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations.



Figure 5-3 Cumulative Plus Project Traffic Volumes and Lane Configurations



		AM Peak Hour				PM Peak Hour			Saturday			Peak H	lour				
Location	Control	Cumu Pr	lative No oject	Cun Plus	nulative Project	Change in	Cumu Pr	lative No oject	Cum Plus	nulative Project	Change in	Cumu Pr	lative No oject	Cur Plu:	nulative s Project	Change	Peak Hour
Location	Control	LOS	Averag e Delay (secs)	LOS	Average Delay (secs)	(secs)	LOS	Average Delay (secs)	LOS	Averag e Delay (secs)	Delay	LOS	Averag e Delay (secs)	LOS	Average Delay (secs)	Delay	Warran t Met?
I-80 Westbound Ramps / Oday Rd Southbound Left Westbound	Westbound Stop	A B	7.9 11.2	A B	8.0 11.3	0.1 0.1	A B	7.6 10.1	A B	7.7 10.2	0.1 0.1					N/A	No
Midway Road / Oday Rd Southbound Eastbound Left	Southbound Stop	B A	13.3 8.1	B A	13.4 8.1	0.1 0.0	B A	11.2 7.9	B A	11.3 7.9	0.1 0.0					N/A	No
I-80 Eastbound Ramps / Midway Rd Northbound Eastbound Left	Northbound Stop	C A	16.4 8.6	C A	16.6 8.6	0.2 0.0	C A	16.0 8.5	C A	16.2 8.6	0.2 0.1					N/A	No
Midway Rd / Porter Rd Westbound	Westbound Stop	A	9.2	А	9.3	0.1	A	9.1	A	9.2	0.1					N/A	No
SR 113 / Midway Rd Northbound Left Southbound Left Eastbound Westbound	Westbound Stop/ Eastbound Stop	А А Е С	8.0 7.8 38.5 16.1	А А Е С	8.1 7.8 45.7 17.0	0.1 0.0 7.2 0.9	А А С Е	8.1 7.9 23.6 46.0	A A D F	8.1 7.9 25.3 53.6	0.0 0.0 1.7 7.6	A A B B	7.7 7.6 13.2 11.1	A A B B	7.7 7.6 13.3 11.3	0.0 0.0 0.1 0.2	Yes1
SR 113 / Hay Rd Northbound Left Eastbound	Eastbound Stop	A B	8.0 14.1	A C	8.0 15.4	0.0 1.3	A C	8.4 21.2	A C	8.4 23.1	0.0 1.9	A B	7.6 10.7	A B	7.6 11.1	0.0 0.4	Yes2
SR 113 / SR 12	Roundabout	С	20.8	С	21.0	0.2	F	124.4	F	125.3	0.9	В	10.4	В	10.5	0.1	N/A
Hay Rd / Project Entrance Northbound Westbound Left	Northbound Stop	A A	9.6 7.4	A A	9.8 7.5	0.2 0.1	A A	9.5 7.5	A A	9.7 7.5	0.2 0.0	A A	9.2 7.4	A A	9.4 7.4	0.2 0.0	No

Table 5-6 Cumulative Plus Project Peak Hour Levels of Service at Intersections

Notes: LOS = level of service; SR = State Route; N/A = not applicable

¹ meets peak hour traffic signal warrant (AM and PM) ² meets peak hour traffic signal warrant (PM)

Source: KDA 2018

As shown in Table 5-6, the two intersections that would operate at unacceptable levels under Cumulative No Project conditions will continue to operate at unacceptable levels under Cumulative Plus Project conditions, and delay would increase at these intersections with the addition of project-generated trips. The SR 113 / Midway Road intersection would operate at the unacceptable levels of LOS E in the AM peak hour and LOS F in the PM peak hour under Cumulative Plus Project conditions and would experience project-generated increases in delay of 7.2 seconds and 7.6 seconds during the AM and PM peak hours, respectively. Additionally, this intersection would meet the peak hour signal warrant in the AM and PM peak hour. The SR 12/ SR 113 intersection is projected to continue to operate at LOS F in the PM peak hour under Cumulative Plus Project conditions, and project-generated traffic is anticipated to result in an increase in delay at this intersection of 0.9 seconds. The SR 113 / Hay Road intersection would also meet the peak hour signal warrant in the PM peak hour; however, the intersection operates at an acceptable level (i.e., LOS C or better).

Therefore, because the project would result in increases in delay at intersections which are projected to operate at unacceptable levels under Cumulative No Project conditions (i.e., SR 113 / Midway Road and SR 12/ SR 113), the project would be considered cumulatively considerable with respect to a significant cumulative impact.

Mitigation Measure 5-1a: SR 113 and Midway Road Intersection Improvements

This intersection is under the jurisdiction of Caltrans, and Caltrans has identified a conceptual project to widen shoulders, construct a median and install a traffic signal at the SR 113 / Midway Road intersection to enhance safety. Within six months of project approval by the County, the project applicant and Solano County shall coordinate with Caltrans and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of the improvements detailed above.

Mitigation Measure 5-1b: SR 12 and SR 113 Intersection Improvements

Installation of a second eastbound lane through the roundabout will improve the LOS to an acceptable level in the PM peak hour. Within six months of project approval by the County, the project applicant and Solano County shall coordinate with Caltrans and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of a second eastbound lane through the roundabout.

Significance after mitigation

Implementation of Mitigation Measure 5-1a and Mitigation Measure 5-1b would improve operating conditions at both intersections such that they would operate at acceptable levels during the AM and PM peak periods. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations. However, the intersection improvement projects detailed in Mitigation Measure 5-1a and Mitigation Measure 5-1b are not included in any planning or programming documents; and are not currently funded. Additionally, because the final approval of the proposed intersection improvements is outside the jurisdiction and control of the applicant and Solano County, it cannot be assured that these mitigation measures would be implemented before project-related trips occurring at this intersection. Therefore, the project would have a considerable contribution to cumulative intersection impacts. Impacts would be **significant and unavoidable**.

CUMULATIVE PLUS PROJECT ROADWAY SEGMENT OPERATIONS

Table 5-7 displays the results of the AM and PM peak hour roadway segment operations analysis under Cumulative No Project and Cumulative Plus Project conditions for each of the six study roadway segments, as well as the project-generated changes in ATS and PTSF. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations.

			AM Pea	ak Hour		PM Pea	ak Hour	
Roadway	Location	Facility Classification	Cumulative No Project (ATS/PTSF/LOS)	Cumulative Plus Project (ATS/PTSF/LOS)	Change (ATS/PTSF)	Cumulative No Project (ATS/PTSF/LOS)	Cumulative Plus Project (ATS/PTSF/LOS)	Change (ATS/PTSF)
Midway Rd	I-80 to Porter Rd Eastbound Westbound	Class I Highway	45.5/45.3/C 45.4/62.2/C	45.3/47.4/C 45.1/61.4/C	-0.2/2.1 -0.3/-0.8	42.6/72.3/D 43.0/59.2/D	42.6/72.9/D 42.9/60.2/D	/0.6 -0.1/1.0
	Porter Rd to SR 113 Eastbound Westbound	Class I Highway	46.5/44.5/C 46.7/42.3/C	46.5/44.5/C 46.5/44.0/C	/0.0 -0.2/1.7	47.3/36.1/C 47.3/39.8/C	47.2/35.1/C 47.2/41.1/C	-0.1/-1.0 -0.1/1.3
SR 113	Midway Rd to Fry Rd Northbound Southbound	Class I Highway	44.3/41.4/D 43.7/53.6/D	44.0/42.8/D 42.9/47.7/D	-0.3/1.4 -0.8/-5.9	43.5/52.8/D 43.5/53.1/D	43.4/54.1/D 43.4/53.6/D	-0.1/1.3 -0.1/0.5
	Fry Rd to Hay Rd Northbound Southbound	Class I Highway	42.9/59.6/D 43.1/46.6/D	42.6/61.1/D 42.8/49.2/D	-0.3/1.5 -0.3/2.6	41.7/63.1/D 41.8/60.4/D	41.6/63.7/D 41.7/60.7/D	-0.1/0.6 -0.1/0.3
_	Hay Rd to SR 12 Northbound Southbound	Class I Highway	43.1/63.0/D 43.4/44.2/D	43.0/63.0/D 43.3/44.4/D	-0.1/0.0 -0.1/0.2	41.9/59.6/D 41.8/65.7/D	41.9/60.5/D 41.7/66.0/D	/0.9 -0.1/0.3
Hay Rd	SR 113 to Daily Rd Eastbound Westbound	Class I Highway	49.2/16.6/C 49.2/29.3/C	48.7/19.0/C 48.9/31.6/C	-0.5/2.4 -0.3/2.3	49.0/36.7/C 48.6/7.9/C	48.9/38.7/C 48.3/7.6/C	-0.1/2.0 -0.3/-0.3

Table 5-7 Cumulative Plus Project Roadway Segment Levels of Service

Notes: ATS = average travel speed, PTSF = percent time spent following, LOS = Level of service, SR = State Route

Source: KDA 2018

As shown in Table 5-7, all roadway segments except the Midway Road segment between I-80 and Porter Road are projected to operate at acceptable levels (i.e., LOS C or better for Solano County roadway segments, LOS D or better for Caltrans roadway segments). The roadway segment of Midway Road between I-80 would operate at unacceptable levels under Cumulative No Project conditions (i.e., LOS D) in the PM peak hour and would continue to operate at the same unacceptable LOS during the PM peak hour under Cumulative Plus Project conditions. Additionally, the addition of project-generated traffic would result in a decrease in ATS in the westbound direction of 0.1 seconds, and an increase in PTSF in the eastbound and westbound directions of 0.6 seconds and 1.0 seconds, respectively.

Therefore, because the project will result in a decrease in ATS and increases in PTSF along a roadway segment which is projected to operate at unacceptable levels under Cumulative No Project conditions (i.e., Midway Road between I-80 and Porter Road), the project would be considered cumulatively considerable with respect to a significant cumulative impact.

Mitigation Measure 5-2: Midway Road (I-80 Eastbound Ramps to Porter Road) Roadway Segment Improvements

A 0.30-mile-long passing lane in both eastbound and westbound directions would be needed to improve the roadway segment LOS to an acceptable level. The project applicant shall coordinate with Solano County and identify the appropriate fair share contribution that the project applicant shall pay toward the construction of the eastbound and westbound passing lanes along Midway Road between the I-80 eastbound ramps and Porter Road.

Significance after mitigation

Implementation of Mitigation Measure 5-2 would result in the roadway segment of Midway Road between the I-80 eastbound ramps and Porter Road operating at acceptable levels under Cumulative Plus Project conditions. Refer to Appendix G of this Draft SEIR for detailed modeling and technical calculations. However, this project is not programmed or funded; and thus, it cannot be assured that the roadway segment improvements detailed in **Mitigation Measure 5-2** would be implemented. Therefore, the project would be cumulatively considerable with respect to cumulative roadway segment impacts. Impacts would be **significant and unavoidable**.

6 ALTERNATIVES

6.1 ALTERNATIVES TO THE PROPOSED PROJECT

The California Code of Regulations (CCR) Section 15126.6(a) (State CEQA Guidelines) requires environmental impact reports (EIRs) to describe "... a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives that are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason." (See also CEQA Guidelines Section 15126.6[f].) This section of the CEQA Guidelines also provides guidance regarding what the alternatives analysis should consider. Subsection (b) further states the purpose of the alternatives analysis, as follows:

Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The State CEQA Guidelines require that the EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project as proposed (CEQA Guidelines Section 15126.6[d]). The State CEQA Guidelines further require that the "no project" alternative be considered (CEQA Guidelines Section 15126.6[e]).

In defining "feasibility" (e.g., "... feasibly attain most of the basic objectives of the project ..."), CEQA Guidelines Section 15126.6(f)(1) states, in part:

Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

In determining what alternatives should be considered in the EIR, it is important to acknowledge the objectives of the project, the project's significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is feasible or infeasible is made by the lead agency's decision-making body, here the Solano County (County) (See Public Resources Code Section 21081[a][3].)

6.1.1 Project Objectives

In determining what alternatives should be considered in the Subsequent Environmental Impact Report (SEIR), the objectives of the project must be considered, as attainment of most of the basic objectives forms one of the tests of

whether an alternative is feasible (see discussion above). The following project objectives have been identified for the project, as previously described (see Chapter 3, "Project Description"):

- ▶ increase the RHR Landfill's disposal capacity by approximately 8.8 million cubic yards;
- maximize daily tonnage to the RHR Landfill, while providing at least 15 years of estimated disposal capacity at the RHR Landfill;
- extend the estimated RHR Landfill life by at least 5 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- extend the ability of JPO to compost Solano County organics by at least 4 years compared to future conditions under which the RHR Landfill's disposal capacity is not increased;
- ► correct the permitted RHR Landfill boundary to reflect existing conditions at the site;
- ▶ allow the RHR Landfill more flexibility in how it balances high-volume and low-volume days;
- > achieve higher solid waste diversion at RHR with better sorting of construction and demolition materials;
- account for changing market conditions for recyclable commodities while avoiding disposal;
- ► allow for the continued disposal of friable asbestos in Solano County past the filling and closure of the existing permitted monofill (DM-1), projected to be 2021; and
- ▶ provide adequate soil cover for the landfill and avoid the import of soil.

6.1.2 Summary of Project Impacts

The Executive Summary chapter (Chapter 2) of this SEIR presents a detailed summary of the potential environmental impacts of implementation of the project. Please refer to Table 2-1 for a summary of impacts associated with development of the project. All impacts associated with the proposed project would be reduced to less-than-significant levels with mitigation, except for cumulatively considerable contributions to significant and unavoidable transportation impacts at the intersections of State Route (SR) 12/SR 113 and SR 113/Midway Road and along Midway Road (see Chapter 5, "Cumulative Impacts").

6.1.3 Alternatives Considered, but not Analyzed in Detail

State CEQA Guidelines Section 15126.6(c) provides the following guidance in selecting a range of reasonable alternatives for the project. The range of potential alternatives for the project shall include those that could feasibly accomplish most of the basic objectives of the project, and could avoid or substantially lessen one or more of the significant effects. The EIR should also identify any alternatives that were considered by the lead agency, but were rejected during the planning or scoping process and briefly explain the reasons underlying the lead agency's determination.

Because of the nature of the project (i.e., expansion of disposal area at an existing landfill, revisions to the existing tonnage limitations to allow for additional throughput, and modifications to internal operations), alternatives that attain most of the project objectives are limited. The Recology Hay Road (RHR) Landfill has been operating continuously since 1964 and has extensive solid waste disposal and landfill control facilities and infrastructure such as monitoring and control systems (e.g., groundwater, landfill gas, leachate), storm water retention ponds, flood control berms, groundwater dewatering facilities, and materials handling and processing areas; therefore, alternative sites for the project are limited. In addition, alternative uses of the project site that do not involve waste disposal are infeasible because of the substantial infrastructure and inactive disposal areas already in place. Further, alternatives are intended to reduce significant environmental impacts. As noted above, the project would result in one significant and unavoidable impact with respect to cumulative transportation conditions. These factors were considered in this analysis, which ultimately resulted in elimination of the following alternatives from further consideration in this Draft SEIR.

OFFSITE ALTERNATIVE - NEW FACILITY

In determining whether alternative locations for the project need to be considered in an EIR, State CEQA Guidelines Section 15126.6(f)(2)(A) states that only locations that would feasibly avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR. In addition, Section 15126.6(f)(2)(B) of the Guidelines provides that if the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion and should include the reasons in the EIR. With respect to assessing the feasibility of alternatives, State CEQA Guidelines Section 15126.6(f)(1) provides that the following factors may be taken into account: site suitability, economic viability, availability of infrastructure, general plan consistency, other plan or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the project proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the project proponent).

Consideration of potential offsite locations for the proposed project is limited to the project region because a primary objective of the project is to provide long-term solid waste disposal capacity to existing RHR Landfill customers (i.e., primarily located in Solano County as well as the San Francisco Bay Area and the Sacramento Valley). The EIR approved in 1993 for expansion of the RHR Landfill evaluated four offsite alternative locations at existing landfills within 62 miles of the RHR Landfill (i.e. Portrero Hills, Clover Flat, Keller Canyon, and Redwood Sanitary Landfills). The 1993 EIR determined that the offsite alternatives would have greater impacts than expansion of the existing landfill because of the additional vehicle miles travelled for RHR Landfill customers to get to these alternative sites would add to traffic congestion and air quality impacts, and could potentially increase adverse litter and noise effects. In addition, the EIR determined there would be a regional net loss in landfill capacity and a lower landfill life at individual alternative sites because of increased utilization of landfill capacity.

In addition, the only significant and unavoidable impact associated with the proposed project would be increases in delay at intersections which are projected to operate at unacceptable levels under Cumulative No Project conditions (i.e., SR 113/Midway Road and SR 12/SR 113), It is unlikely that construction of a new landfill facility at a new location would avoid the significant and unavoidable traffic impact on intersection level of service because construction of a new facility would require substantially more construction trips compared to expansion of an existing facility, and operation of a new facility of similar capacity to the proposed project would likely have similar long-term impacts on the transportation network. (Offsite alternatives could also logically include expansion of a different landfill in the region. For purposes of this analysis, "offsite alternative" would be a new solid waste disposal facility. Routing RHR Landfill customers to another existing landfill owned by Recology is considered in the range of reasonable alternatives assessed below).

Construction of a new facility also has a higher potential to have a greater effect on air quality and GHG emissions; biological resources; cultural resources; geology, soils, and mineral resources; hazards and hazardous materials; hydrology and water quality; land use and agriculture resources; noise; traffic and transportation; visual resources; and utilities. Development of a new landfill on a previously undeveloped site would require far more construction than expansion of an existing site and there is greater potential for disturbance of resources with undeveloped sites. Although this alternative may reduce localized impacts associated with the currently proposed project, it would result in greater impacts to numerous resource areas compared to the proposed project; would be substantially more costly to conduct siting studies and construction of a new landfill also has a higher potential for issues related to land use compatibility. This alternative would be costly, would not minimize the net fiscal effects on rate payers and taxpayers, and would not conserve resources while providing a reasonable level of solid waste disposal. Therefore, this alternative is eliminated from further consideration in this SEIR.

ALTERNATIVE TECHNOLOGY ALTERNATIVE

To handle additional waste disposal needs, Recology also considered alternative means of reducing waste disposed of within RHR Landfill. The use of alternative technologies, such as thermal conversion, is one method of reducing the need for additional waste disposal capacity that was considered. Thermal conversion technologies use high temperatures to convert waste into ash, flue gas (i.e., combustion exhaust gas), and heat. Facilities that use this

technology may also include scrubbers and filters that clean flue gas and reduce pollution emissions; however, these facilities still produce some heavy metal and dioxin emissions and toxic fly ash that must be disposed of properly in a Class I landfill. This alternative may also result in additional traffic and air quality impacts beyond those identified for the project evaluated as part of this SEIR during construction of alternative technology infrastructure onsite and then transporting of ash to a Class I landfill. In addition, implementation of alternative technologies would result in additional time, costs, and permitting requirements associated with updating the landfill infrastructure to accommodate the new technologies. Because of the additional costs and permitting required for this alternative, it is considered infeasible. As a result, this alternative was eliminated from further consideration in this SEIR.

6.1.4 Alternatives Evaluated in this SEIR

Alternatives evaluated in this SEIR are:

- Alternative 1: No Project;
- Alternative 2: Vertical Expansion Alternative; and
- ► Alternative 3: Recology Ostrom Road (ROR) Expansion Alternative.

The rationale for selection of these alternatives is provided below.

ALTERNATIVE 1: NO PROJECT

CEQA Guidelines Section 15126.6(e)(1) requires that the no project alternative be described and analyzed "to allow decision makers to compare the impacts of approving the project with the impacts of not approving the project." The no project analysis is required to discuss "the existing conditions at the time the notice of preparation is published...as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Section 15126.6[e][2]). "If the project is...a development project on identifiable property, the 'no project' alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the RHR property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed. In certain instances, the no project alternative means 'no build' wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment" (Section 15126[e][3][B]).

Under the No Project Alternative, no amendments to the existing RHR Landfill land use permit (LUP) and other permits would be made and current conditions would continue until the landfill reaches capacity. Once the site reaches capacity, the landfill would be closed in accordance with closure and monitoring procedures and groundwater and LFG would continue to be monitored. All structures unrelated to ongoing monitoring of the site would be removed. Alternative uses of the site would not be practical as it is dedicated as a long-term waste disposal site, and there are currently several inactive disposal areas within the site that would not be suitable for any other use. Therefore, the No Project Alternative reasonably assumes no additional facilities would be constructed on the project site. Once the existing landfill reaches capacity, other regional options would need to be in place to meet the waste disposal needs for Solano County and other RHR customers in the region. Potential options could include transporting the waste to a disposal site outside of the county, construction of a new landfill (as evaluated above), or expansion of an existing landfill (as evaluated below as Alternative 3). Implementation of this alternative would avoid the impacts associated with the proposed project, but would not meet the need for long-term solid waste disposal capacity in Solano County and the region, would not minimize the net fiscal effects on rate payers and taxpayers, and would not conserve resources while providing a reasonable level of solid waste disposal. Therefore, this alternative would not realize any of the basic objectives of the project.

ALTERNATIVE 2: VERTICAL EXPANSION ALTERNATIVE

Alternative 2 would involve an increase in the allowable height limit of the existing landfill as part of the amended CUP to the maximum feasible height (260 feet above ground surface) from a grading perspective (shown in Figure 6-1). A summary of the increased total disposal capacity and landfill life for Alternative 2 compared to the proposed project is shown in Table 6-1. This alternative would result in no lateral expansion of the landfill into the Triangle and no increase to existing tonnage limit of 2,400 tons per day (tpd). As a result, deepening and widening of the borrow pit and installation of an additional flare would not be required under this alternative. However, improvements to existing C&D operations, as well as temporary storage of recyclable bales would occur under this alternative. While this alternative would result in an expansion in the overall solid waste disposal capacity of the landfill, the expansion would accommodate approximately 7,721,700 cy less than that of the proposed project. The smaller increase in disposal capacity under Alternative 2 would result in an estimated closure date extension of approximately 1.5 years versus a date extension of at least five years that would likely occur under the proposed project.

	Increase In Gross Disposal Capacity ¹	Approximation of Additional Life of Landfill with Existing Tonnage Limit of 2,400 tpd ²
Alternative 2	1,119,100 cy	1.5 years
Proposed Project	8,840,800 cy	at least 5 years

Table 6-1 Alternative 2 Compared to Proposed Project

Notes: Tpd = tons per day; cy = cubic yards

¹ Includes volume of waste disposed, daily and intermediate cover utilized, and final cover soils placed.

² Current fill rate based on annual tonnage received in 2017-18 with a 1.9% growth rate as of 6/30/18. Includes San Francisco waste stream until January 2026.

Source: Golder 2018; adapted by Ascent 2019

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ALTERNATIVE 3: RECOLOGY OSTROM ROAD LANDFILL EXPANSION ALTERNATIVE

Under Alternative 3, expansion in disposal capacity would occur at the Recology Ostrom Road (ROR) Landfill instead of expanding disposal capacity at RHR Landfill. ROR is a Class II Landfill and the only other landfill owned and operated by Recology. Located in southern Yuba County (5900 Ostrom Rd, Wheatland, CA), the ROR Landfill is approximately 76 miles northeast of RHR Landfill and provides solid waste disposal services to both municipal and commercial customers in the northern Sacramento Valley including Yuba, Sutter, Butte, Nevada, and Colusa Counties. The facility has been in operation since 1995, and to date, approximately 70 acres out of a total landfill development of 225 acres has been constructed and approved for operation (CRWQCB 2018: 2). The facility's maximum permitted capacity is 43,467,231 cubic yards (CY) and maximum permitted throughput is 3,000 tons per day (CalRecycle 2007). With a remaining capacity of 24,395,000 tons as of June 2016, ROR Landfill is estimated to reach capacity by 2102 (CVRWQCB 2018:2). Expansion of an existing waste disposal facility would have fewer impacts than construction of a new site, and as discussed above, other offsite alternatives were determined to be infeasible. To meet long-term, regional solid waste disposal needs, the projected additional solid waste capacity necessary for RHR customers (i.e., 8.8 million cubic yards) would be provided at ROR Landfill for disposal instead of through the expansion of existing disposal capacity at RHR Landfill. Under this alternative, a similar lateral expansion of ROR Landfill would occur. Additionally, vehicles carrying solid waste coming from the Bay Area would travel an additional 152 miles per round trip to reach the ROR Landfill. Assuming that only transfer and packer trucks associated with the projected increase in vehicle trips under the proposed project would travel to the ROR Landfill instead of the RHR Landfill, up to 114 vehicles per day (refer to Table 4.11-6 of Section 4.11, 'Transportation') would travel the additional 152 miles, resulting in a net increase of 17,328 vehicle miles per day under this alternative, compared to the proposed project. However, no expansion of operations or potential increase in the number of vehicles travelling to and from the landfill per day would occur at the RHR Landfill under this alternative.

6.1.5 Evaluation of Alternatives

ALTERNATIVE 1: NO PROJECT

Aesthetics

Under the No Project Alternative, the landfill would not be expanded to increase the current long-term capacity. Operations would continue in a manner similar to existing conditions until the landfill reaches capacity. Under the No Project Alternative, the potentially significant effects of the proposed project related to litter control would not occur. Mitigation is available to reduce this impact to a less-than-significant level; however, overall, the potential for windblown litter under No Project Alternative would be less than the project. (*Less*)

Air Quality

Under the No Project Alternative, the landfill capacity at the project site would not be expanded, no operational changes would occur, and the CUP and other permits would not be amended to increase capacity at the landfill. This alternative would avoid the project's construction and operational impacts associated with the expanded capacity. The existing landfill, under this alternative, would continue to comply with applicable Yolo-Solano Air Quality Management District (YSAQMD), Bay Area Air Quality Management District (BAAQMD), and California Air Resources Board (CARB) regulations. Therefore, the No Project Alternative would have a lesser overall impact on air quality, as compared to the proposed project. *(Less)*

Archaeological, Historical, and Tribal Cultural Resources

Under the No Project Alternative, no construction-related ground disturbing activities would occur within the project site and the existing footprint of the landfill would not change. Under the No Project Alternative, the potentially significant effects of the proposed project on previously undiscovered subsurface unique archaeological resources and unknown tribal cultural resources would not occur. Mitigation is available to reduce these impacts to a less-than-

significant level; however, overall, archaeological and tribal cultural resource impacts under No Project Alternative would be less than the project. (*Less*)

Biological Resources

Under the No Project Alternative, the footprint of the existing permitted landfill would not be expanded into the Triangle area, and the landfill would continue to operate in a manner similar to existing conditions. Under the No Project Alternative, the potentially significant effects associated with project implementation on special-status plants; California tiger salamander; giant garter snake; burrowing owl; California black rail; northern harrier; Swainson's hawk; tricolored blackbird; white-tailed kite; other nesting birds; special-status branchiopods; Delta green ground beetle; wetlands; vernal pools; and other waters of the United States and State would not occur. Additionally, potential conflicts with Solano County General Plan policies would also not occur because conversion of vernal pool habitat within an area identified as a high-priority habitat area by the County would not occur (Solano County 2008: RS-15). As noted in Section 4.3, "Biological Resources," mitigation is available to reduce project-related impacts to a less-than-significant level. However, impacts to sensitive biological resources would be avoided altogether and would be less with implementation of the No Project Alternative compared to the proposed project. *(Less)*

Energy

Under the No Project Alternative, solid waste disposal would continue at the RHR Landfill within the limits of the existing CUP. Under this alternative, the daily tonnage limit would remain the same, and there would be less fuel consumption associated with landfill operations compared to the project. On-site operations would not change compared to existing conditions, and no on-site construction would occur. As described in Section 4.4, "Energy," the project's energy use impact would be less than significant as it would not result in inefficient, wasteful, and unnecessary consumption of energy. Under the No Project Alternative, energy impacts would also be less than significant but of lesser magnitude because of the lesser fuel consumption associated with solid waste hauling. (*Less*)

Geology, Soils, Mineral, and Paleontological Resources

Under this alternative, no expansion of the landfill would occur, and existing onsite operations would continue, similar to existing conditions and within the limits of the existing CUP. The potential for the proposed project to uncover previously unknown paleontological resources during ground-disturbing construction activities would be avoided under this alternative. Although the proposed project would have a less-than-significant impact on geology, soils, and mineral resources with mitigation, these impacts would be avoided under the No Project Alternative. Therefore, overall, the No Project Alternative would result in less of an impact to geology, soils, minerals, and paleontological resources compared to the project. *(Less)*

Greenhouse Gas Emissions

Under the No Project Alternative, the landfill capacity at the project site would not be expanded, no operational changes or construction would occur, and the CUP and other permits would not be amended to increase capacity at the landfill. This alternative would avoid the project's construction and operational impacts associated with the expanded capacity and climate change. Although the proposed project would have a less-than-significant impact on GHG emissions, impacts would be avoided under the No Project Alternative Therefore, the No Project Alternative would have a lesser overall impact on GHG emissions, as compared to the proposed project. *(Less)*

Hazards and Hazardous Materials

Under this alternative, no construction and/or additional operational activities related to landfill expansion would occur, and existing operations at the RHR Landfill would be similar to existing conditions. Although the impacts of the proposed project on hazards and hazardous materials would be less than significant, these impacts would be avoided altogether under the No Project Alternative. Therefore, impacts of the No Project Alternative on hazards and hazardous materials would be less than significant would be less than the proposed project. *(Less)*

Hydrology and Water Quality

Under the No Project Alternative, potential impacts of the proposed project on hydrology and water quality, including groundwater, would be avoided, and stormwater from operation of the landfill would continue to be captured within the limits of the existing disposal area. Although the impacts of the proposed project on hydrology and water quality would be less than significant with mitigation, these impacts would be avoided under the No Project Alternative. Therefore, impacts of the No Project Alternative on hydrology and water quality would be less than the proposed project. (*Less*)

Noise

Under this alternative, the proposed project would not be implemented, and existing onsite operations would continue similar to existing conditions. The proposed project would have less-than-significant impacts on noise; however, these impacts would be avoided under the No Project Alternative. Therefore, overall, the No Project Alternative would result in less of an impact on noise than the project. *(Less)*

Transportation

Under the No Project Alternative, RHR Landfill would not be expanded and the CUP would not be amended. Therefore, the considerable contribution to significant and unavoidable cumulative intersection (i.e., SR 113/Midway Road and SR 12/SR 113) and roadway segment (i.e., Midway Road between I-80 and Porter Road) operations impacts associated with the proposed project at local transportation facilities would be avoided. As a result, impacts associated with this alternative would be less than the proposed project. (*Less*)

ALTERNATIVE 2: VERTICAL EXPANSION ALTERNATIVE

Aesthetics

Alternative 2 would replace the proposed lateral landfill expansion with an increase to the vertical height of the existing landfill to the maximum that is feasible from a grading perspective. Under this alternative, the maximum height of the landfill would be 260 feet above ground surface (abs) (see Figure 6-1). Similar to the proposed project, there would be no increase in nighttime lighting. Under Alternative 2, the Triangle area would remain undeveloped and the height of the existing landfill disposal area would be increased by 30 feet abs to a maximum of 90 feet abs from the proposed final grade. Under the proposed project, maximum height of the landfill would be 170 feet abs at final grade. However, most views of landfill operations to motorists driving along the eastern portion of Hay Road and SR 113 are partially screened or obstructed because of steep terrain surrounding the landfill boundary and the landfill modules appear as rolling hills against the background of the Vaca Mountain range. It would be anticipated that the height increase would be noticeable to motorists but would blend in with steep terrain surrounding the landfill and the mountain range in the background. Under Alternative 2, the potentially significant effects of the proposed project related to control of windblown litter from the landfill would likely be greater due to the increased height of the landfill. Mitigation is available to reduce these impacts to a less-than-significant level; however, overall, litter under Alternative 2 would be greater due to the increased height. Visual impacts would be less than significant with the proposed project, but would be greater because of the increased visibility and landfill height associated with Alternative 2. (Greater)

Air Quality

The primary difference between Alternative 2 and the proposed project is that a vertical expansion would replace the proposed lateral expansion and a much smaller increase in disposal capacity and shorter expansion of landfill life would occur. The existing landfill, under this alternative, would continue to comply with applicable Yolo-Solano Air Quality Management District (YSAQMD), Bay Area Air Quality Management District (BAAQMD), and California Air Resources Board (CARB) regulations. Because lateral expansion would not occur under this alternative, construction-related air quality impacts are expected to be less than the proposed project. The reduced disposal capacity under this alternative would result in the landfill reaching capacity sooner than under the proposed project. Therefore, long-term operational impacts associated with air quality would be less under this alternative because there would be

fewer vehicle trips and less waste producing LFG. Overall, the impacts of Alternative 2 on air quality would be less than the proposed project. (Less)

Archaeological, Historical, and Tribal Cultural Resources

The potentially significant effects of the proposed project on previously undiscovered subsurface unique archaeological resources and unknown tribal cultural resources would be less under Alternative 2 because no ground-disturbing activities associated with development of the Triangle and installation of an additional flare. Mitigation is available to reduce these impacts to a less-than-significant level under the proposed project. Overall, impacts related to archaeological, historical, and tribal cultural resources would be less than the proposed project. (*Less*)

Biological Resources

Replacing the proposed lateral landfill expansion with an increase to the vertical height of the existing landfill under Alternative 2 would result in no disturbance of habitat located within the Triangle area. Therefore, the potentially significant effects of the proposed project on special-status plants; California tiger salamander; giant garter snake; burrowing owl; California black rail; northern harrier; Swainson's hawk; tricolored blackbird; white-tailed kite; other nesting birds; special-status branchiopods; Delta green ground beetle; wetlands; vernal pools; and other waters of the United States and State would not occur. Mitigation is available to reduce these impacts to a less-than-significant level; however, overall, impacts to sensitive biological resources would be less or eliminated under the Lateral Expansion Alternative. In addition, the magnitude and types of construction activities would be less under Alternative 2 because expansion onto undeveloped land within the Triangle would not occur. Overall, impacts to biological resources under Alternative 2 are expected to be less compared to the proposed project. *(Less)*

Energy

The Vertical Expansion Alternative would result in no development of the Triangle area or increase to existing tonnage limits at the landfill. This alternative would have a less-than-significant energy impact as it would result in less new development that could result in wasteful, inefficient, or unnecessary consumption of energy. Compared to the proposed project, Alternative 2 would result in in less fuel consumption associated with the use of construction equipment and vehicles travelling to and from the landfill. As described in Section 4.4, "Energy," the project's energy use impact would be less than significant as it would not result in inefficient, wasteful, and unnecessary consumption of energy. Relative to the proposed project, impacts would be of lesser magnitude under the Vertical Expansion Alternative because fewer construction activities and truck trips would result in less new use of energy. (*Less*)

Geology, Soils, Mineral, and Paleontological Resources

Alternative 2 would replace the proposed lateral landfill expansion with an increase to the vertical height of the existing landfill and no installation of an additional flare would occur. The potential for the proposed project to uncover previously unknown paleontological resources during ground-disturbing construction activities would be avoided under this alternative because no ground-disturbing construction activities would occur under Alternative 2. Although the proposed project would have a less-than-significant impact on geology, soils, and mineral resources, these impacts would be avoided under Alternative 2. Therefore, overall, the Vertical Expansion Alternative would result in less impacts to geology, soils, minerals, and paleontological resources compared to the project. (*Less*)

Greenhouse Gas Emissions

The primary difference between Alternative 2 and the proposed project is that a vertical expansion would replace the proposed lateral expansion and a much smaller increase in disposal capacity and shorter expansion of landfill life would occur. Because lateral expansion would not occur under this alternative, fewer construction-related GHG emissions would be generated compared to the proposed project. The reduced disposal capacity under this alternative would result in the landfill reaching capacity sooner than under the proposed project. Therefore, long-term operational impacts associated with GHG emissions would be less because there would be fewer landfill-generated methane and mobile source emissions compared to the proposed project. Overall, the impacts of Alternative 2 on GHG emissions would be less than the proposed project. *(Less)*

Hazards and Hazardous Materials

Under this alternative, no construction and operation related to lateral landfill expansion on undeveloped land would occur, less LFG would be produced due to a smaller landfill expansion, and existing operations at RHR Landfill would be similar to existing conditions. Although the impacts of the proposed project on hazards and hazardous materials would be less than significant, impacts of the Vertical Expansion Alternative on hazards and hazardous materials would be less than the proposed project. (*Less*)

Hydrology and Water Quality

Under Alternative 2, deepening and widening of the existing borrow pit and expansion of the landfill into the triangle area would not occur. Therefore, potential impacts of the proposed project on hydrology, water quality, and groundwater would be less compared to the proposed project, and stormwater from operation of the existing landfill footprint would continue to be captured and monitored onsite. Although the impacts of the proposed project on hydrology, water quality, and groundwater would be less than significant with mitigation, these impacts would be avoided under Alternative 2. Therefore, overall, the Vertical Expansion Alternative would result in less of an impact to hydrology, water quality, and groundwater compared to the project. (*Less*)

Noise

Under this alternative, the proposed project would be reduced and existing onsite operations would continue similar to existing conditions. The proposed project would have less-than-significant impacts on noise; however, these impacts would be less under Alternative 2. Therefore, overall, the Vertical Expansion Alternative would result in less of an impact on noise than the project. (*Less*)

Transportation

Under the Lateral Expansion Alternative, the life of the landfill would increase but no increase under the CUP's existing tonnage limit of 2,400 tpd would occur. Therefore, the considerable contribution to significant and unavoidable cumulative intersection (i.e., SR 113/Midway Road and SR 12/SR 113) and roadway segment (i.e., Midway Road between I-80 and Porter Road) operations impacts associated with the proposed project would be avoided. The overall impacts of the Lateral Expansion Alternative related to transportation would be less than the proposed project. (*Less*)

ALTERNATIVE 3: RECOLOGY OSTROM ROAD LANDFILL EXPANSION ALTERNATIVE

Aesthetics

Alternative 3 would include expansion of the existing ROR Landfill instead of RHR Landfill. Surrounding land uses in the area include agriculture to the east, a rural residential home approximately one mile from the site, Beale AFB to the north, and a wetlands mitigation bank at Best Slough. Similar to the project, sensitive receptors with views of ROR Landfill include one residential home a mile from the site, and are similar to those with views of RHR Landfill, and would likely result in similar visual impacts as the proposed project. Unlike the RHR Landfill site, expansion of the ROR Landfill would not be visible from a scenic highway. Visual impacts would be less than significant with the proposed project; however, visual impacts would be less under Alternative 3 because a scenic highway is not located in the vicinity of the ROR Landfill. Under Alternative 3, the potentially significant effects of the proposed project related to windblown litter would likely be similar. Mitigation is available to reduce this impact to a less-than-significant level; however, overall, litter control under Alternative 3 would be similar. (*Similar*)

Air Quality

Because Alternative 3 would require construction of a similar disposal expansion footprint to the proposed project; construction under this alternative would likely be similar. Long-term operational impacts to air quality and emissions related to LFG are expected to be similar under the proposed project and Alternative 3 because the additional volume of waste accommodated by ROR Landfill would be the same as the project. However, ROR Landfill is located in in Yolo County and transporting waste from RHR Landfill customers (i.e., Solano County, San Francisco Bay Area, and Sacramento Valley) would result in a farther distance than under the proposed project. The additional miles

travelled compared to the proposed project would result in additional operational emissions related to truck trips. Although mitigation is available to reduce these impacts, Alternative 3 would have a greater overall impact on air quality compared to the proposed project. (*Greater*)

Archaeological, Historical, and Tribal Cultural Resources

The potentially significant effects of the proposed project on previously undiscovered subsurface unique archaeological resources and unknown tribal cultural resources would be similar under Alternative 3 because this alternative would result in similar expansion and ground-disturbing activities. Mitigation is available to reduce these impacts to a less-than-significant level. Under Alternative 3, it is considered likely that similar mitigation measures would be required at the ROR Landfill, and overall impacts related to archaeological, historical, and tribal cultural resources are anticipated to be similar to the proposed project. (*Similar*)

Biological Resources

Alternative 3 would include expansion of an existing facility and operations similar to the proposed project. The ROR Landfill is also surrounded by sensitive habitats (ex., vernal pools) that are similar to the RHR Property. Therefore, landfill expansion at the ROR Landfill could result in similar impacts to the project related to development of undisturbed sensitive habitat. Although mitigation is available to reduce these impacts, Alternative 3 may result in a similar overall impact on biological resources compared to the proposed project. (*Similar*)

Energy

Similar to the project, Alternative 3 would have a less-than-significant energy impact as it would not result in new development that could result in wasteful, inefficient, or unnecessary consumption of energy. Construction of Alternative 3 would result in similar fuel consumption associated with the use of construction equipment and construction vehicles travelling to and from the landfill. The project's energy use impacts would be less than significant. However, operation of Alternative 3 would result in greater fuel consumption than the proposed project because transporting waste from RHR Landfill customers (i.e., Solano County, San Francisco Bay Area, and Sacramento Valley) to the ROR Landfill would result in a farther distance for trucks to travel to and from the landfill. Relative to the project, fuel consumption from operations would be higher under the ROR Landfill Expansion Alternative. (*Greater*)

Geology, Soils, Mineral, and Paleontological Resources

Similar to the project, impacts on geology, soils, and mineral resources under Alternative 3 are anticipated to be lessthan-significant through compliance with existing regulations. According to the Yuba County 2030 General Plan EIR, no paleontological resources have been previously identified in the County. Therefore, the potential for Alternative 3 to result in uncovering previously unknown paleontological resources would be less than the proposed project. (*Less*)

Greenhouse Gas Emissions

Because Alternative 3 would require construction of a similar disposal expansion footprint to the proposed project, similar construction-related GHG emissions would be generated. Because the additional volume of waste accommodated by ROR Landfill would be the same as the proposed project, long-term operational impacts would produce a similar amount of landfill-generated methane and mobile source emissions. However, ROR Landfill is located in in Yolo County and transporting waste from RHR Landfill customers (i.e., Solano County, San Francisco Bay Area, and Sacramento Valley) to the ROR would result in a farther distance than the proposed project. The additional miles travelled compared to the proposed project would result in additional operational-related emissions related to truck trips. Therefore, Alternative 3 would result in a greater overall impact related to operational-related GHG emissions compared to the proposed project. (*Greater*)

Hazards and Hazardous Materials

Impacts on hazards and hazardous materials are expected to be similar under Alternative 3 because the footprint of ROR Landfill would need to be expanded, which could result in similar hazards during construction. Operations under Alternative 3 would be similar to the proposed project. Therefore, hazards associated with operation of Alternative 3

are expected to be similar to the proposed project. The proposed project would have a less-than-significant impact related to hazards and hazardous materials through compliance with existing regulations. Overall, impacts related to hazards and hazardous materials under Alternative 3 would be similar to the proposed project. *(Similar)*

Hydrology and Water Quality

Impacts on hydrology and water quality are expected to be similar under Alternative 3 because the footprint of ROR Landfill would be similarly expanded, which could result in a negligible increase in impervious surfaces across the site. Similar to the project, the surface water management system under this alternative would be required to handle a minimum 100-year, 24 hour storm event such that any additional runoff generated onsite would be retained at the landfill property and no offsite flooding or potential capacity exceedances of existing or planned storm drains would occur. Similar to the proposed project, this alternative would require Recology to control onsite stormwater and protect water quality through implementation of a SWPPP and associated BMPs, as required by federal and State regulations. Design of the new disposal expansion area and associated liner would also be required to comply with federal and State regulations regarding water quality, similar to the project. It is possible that deepening and widening of the existing borrow pit at the ROR Landfill would be necessary under Alternative 3; however, similar to the project, it is anticipated that implementation of this alternative would not require groundwater supplies in excess of current demands for dust control. Overall, groundwater impacts and hydrology and water quality impacts associated with operation of Alternative 3 are expected to be similar to the proposed project through required compliance with existing regulations and mitigation. *(Similar)*

Noise

Both the ROR and RHR facilities are located approximately one mile from the nearest residence. Under Alternative 3, construction and operations would likely be similar to the proposed project. The proposed project would result in less-than-significant impacts related to noise. Overall, impacts of the ROR Expansion Alternative on noise would be similar to the proposed project. (*Similar*)

Transportation

Construction-related traffic under Alternative 3 would be similar to the proposed project. No expansion of disposal capacity at RHR Landfill would occur under Alternative 3. Therefore, the considerable contribution to significant and unavoidable cumulative intersection (i.e., SR 113/Midway Road and SR 12/SR 113) and roadway segment (i.e., Midway Road between I-80 and Porter Road) operations impacts associated with the proposed project would be avoided. However, waste from RHR Landfill customers would be transported to the more distant landfill facility once the RHR Landfill reaches capacity under the existing CUP. Therefore, long-term transportation impacts could be greater than those caused by the project. Although this alternative would avoid significant localized traffic impacts associated with the project, it could create or exacerbate localized traffic impacts near ROR. Therefore, overall transportation impacts of the ROR Landfill Expansion Alternative would be greater than the proposed project. (*Greater*)

6.1.1 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6 suggests that an EIR should identify the "environmentally superior" alternative. "If the environmentally superior alternative is the 'no project' alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." Table 6-2 provides a tabular comparison of the three alternatives evaluated in this chapter in contrast to the proposed project.

The No Project Alternative would avoid the localized significant environmental impact associated with the proposed project and the other "build" alternatives. However, if the project or a similar expansion of RHR Landfill is not undertaken, an alternative location for solid waste disposal in the region would be necessary. As noted above, the RHR Landfill represents one of the closer regional landfills to the Bay Area. An alternative solid waste disposal location would likely be farther away, and require longer haul truck trips, which would result in a greater overall impact on air quality, GHG emissions, and transportation within the region. In addition, the No Project Alternative would not meet the need for long-term solid waste disposal capacity in Solano County and elsewhere in the region,

would not minimize the net fiscal effects on rate payers and taxpayers, and would not conserve resources while providing a reasonable level of solid waste disposal. Therefore, this alternative would not realize the basic objectives of the project.

Resource Area	Proposed Project	Alternative 1: No Project	Alternative 2: Vertical Expansion Alternative	Alternative 3: ROR Expansion Alternative
Aesthetics	Less than Significant	Less	Greater	Similar
Air Quality and Greenhouse Gas Emissions	Less than Significant	Less	Less	Greater
Archaeological, Historic, and Tribal Cultural Resources	Less than Significant	Less	Less	Similar
Biological Resources	Less than Significant	Less	Less	Similar
Energy	Less than Significant	Less	Less	Greater
Geology, Soils, Mineral, and Paleontological Resources	Less than Significant	Less	Less	Less
Hazards and Hazardous Materials	Less than Significant	Less	Less	Similar
Hydrology and Water Quality	Less than Significant	Less	Less	Similar
Noise	Less than Significant	Less	Less	Similar
Transportation	Significant and Unavoidable	Less	Less	Greater

Table 6-2	Comparison of the Environmental Im	pacts of the Alternatives in	Relation to the Proposed Project
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Source: Compiled by Ascent Environmental in 2019

With regard to the other alternatives considered in this SEIR, development of Alternative 2 (Vertical Expansion Alternative) would reduce all but aesthetic-related potentially significant impacts of the project, primarily through less land disturbance. Alternative 3 would reduce localized impacts at the RHR Landfill but would have potentially greater impacts associated with haul trucks travelling further for disposal purposes and similar localized impacts at ROR Landfill. With respect to Alternative 2, it would avoid the considerable contribution to significant and unavoidable cumulative intersection and roadway segment operational impacts in the vicinity of the RHR Landfill associated with the project. With the exception of aesthetics, Alternative 2 would reduce impacts associated with all other resource areas compared to the proposed project. While Alternative 2 would involve an expansion of landfill capacity, consistent with the project objectives, it would not achieve the project objectives related to increased gross disposal capacity and extension of the landfill's life to the extent of the proposed project. Therefore, Alternative 2 would be environmentally superior within the near term but may result in greater long-term effects as a result of a lack of solid waste disposal options available to the Bay Area, similar to Alternative 3. Therefore, the environmental impact differences between the project and Alternative 2 are not substantial enough that one is clearly superior over the other. On balance, the environmentally superior alternative would be either the project or Alternative 2, depending on decisions weighing types of environmental benefits and adverse effects by Solano County.

7 OTHER CEQA-REQUIRED SECTIONS

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project be considered when evaluating its impact on the environment, including planning, acquisition, development, and operation. As part of this analysis, the EIR must also identify the following: (1) significant environmental impacts of the proposed project, (2) significant environmental effects that cannot be avoided if the proposed project is implemented, (3) significant irreversible environmental changes that would result from implementation of the proposed project, and (4) growth-inducing impacts of the proposed project. Although growth inducement itself is not considered an environmental effect, it could potentially lead to foreseeable physical environmental effects, which are discussed under Growth Inducing Impacts below.

7.1 SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT THAT CANNOT BE AVOIDED

Section 21100(b)(2)(A) of the State CEQA Guidelines provides that an EIR shall include a detailed statement setting forth "in a separate section: any significant effect on the environment that cannot be avoided if the project is implemented." Accordingly, this section provides a summary of significant environmental impacts of the project that cannot be mitigated to a less-than-significant level.

Chapter 4, "Environmental Setting, Environmental Impacts, and Mitigation Measures," provides a description of the potential environmental impacts of the project and recommends various mitigation measures to reduce impacts, to the extent feasible. Chapter 5, "Cumulative Impacts," determines whether the incremental effects of this project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects. After implementation of the recommended mitigation measures, most of the impacts associated with development of the project would be reduced to a less-than-significant level. The following impacts are considered significant and unavoidable; that is, no feasible mitigation is available to reduce the project's impacts to a less-than-significant level.

Chapter 5, Cumulative Impacts, Transportation:

- Cumulative Plus Project Intersection Operations
- ► Cumulative Plus Project Roadway Segment Operations

7.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the proposed project. Section 15126.2(c) states:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if:

- ► the primary and secondary impacts would generally commit future generations to similar uses;
- the project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project;

- ▶ the project would involve a large commitment of nonrenewable resources; or
- the proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Development of the proposed project would result in the continued commitment of the landfill to solid waste disposal, thereby precluding any other uses for the lifespan of the project.

The CEQA Guidelines also require a discussion of the potential for irreversible environmental damage caused by an accident associated with the project. While the project would result in the use, transport, storage, and disposal of some hazardous wastes, as described in Section 4.6, Hazards and Hazardous Materials, future activities would be substantially similar to those that are already occurring. They would continue to be required to comply with applicable state and federal laws related to the use, storage, and disposal of hazardous materials, which significantly reduces the likelihood and severity of accidents that could result in irreversible environmental damage.

Implementation of the proposed project would result in the continued long-term commitment of resources to support landfill operation within the project site. The most notable significant irreversible impacts are increased generation of pollutants, and the short-term commitment of non-renewable and/or slowly renewable natural and energy resources, such as water and power resources during construction. Modified operations at the landfill would also consume water, electricity, and fossil fuels. These consequences of the project are described in the appropriate technical sections in Chapter 4 of this EIR. Some of these resources, however, would be committed to operating and monitoring the LFG system. In light of this and the limited scope of resource use (primarily monitoring and flaring of methane gas), the amount and rate of consumption of these resources would not result in the unnecessary, inefficient, or wasteful use of resources.

7.3 GROWTH-INDUCING IMPACTS

CEQA specifies that growth-inducing impacts of a project must be addressed in an EIR (CCR Section 21100[b][5]). Specifically, CCR Section 15126.2(d) states that the EIR shall:

Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

Direct growth inducement would result if a project involved construction of new housing, which would facilitate new population to an area. Indirect growth inducement would result, for instance, if implementing a project resulted in any of the following:

- ▶ substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises);
- substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand; and/or
- removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

The State CEQA Guidelines do not distinguish between planned and unplanned growth for purposes of considering whether a project would foster additional growth. Therefore, for purposes of this EIR, to reach the conclusion that a project is growth inducing as defined by CEQA, the EIR must find that it would foster (i.e., promote, encourage, allow) additional growth in economic activity, population, or housing, regardless of whether the growth is already approved

by and consistent with local plans. The conclusion does not determine that induced growth is beneficial or detrimental, consistent with Section 15126.2(d) of the State CEQA Guidelines.

If the analysis conducted for the EIR results in a determination that a project is growth-inducing, the next question is whether that growth may cause adverse effects on the environment. Environmental effects resulting from induced growth fit the CEQA definition of "indirect" effects in Section 15358(a)(2) of the State CEQA Guidelines. These indirect or secondary effects of growth may result in significant environmental impacts. CEQA does not require that the EIR speculate unduly about the precise location and site-specific characteristics of significant, indirect effects caused by induced growth, but a good-faith effort is required to disclose what is feasible to assess. Potential secondary effects of growth could include consequences – such as conversion of open space to developed uses, increased demand on community and public services and infrastructure, increased traffic and noise, degradation of air and water quality, or degradation or loss of plant and wildlife habitat – that are the result of growth fostered by the project.

The decision to allow those projects that result from induced growth is the subject of separate discretionary processes by the lead agency(ies) responsible for considering such projects. Because the decision to allow growth is subject to separate discretionary decision making, and such decision making is itself subject to CEQA, the analysis of growth-inducing effects is not intended to determine site-specific environmental impacts and specific mitigation for the potentially induced growth. Rather, the discussion is intended to disclose the potential for environmental effects to occur more generally, such that decision makers are aware that additional environmental effects are a possibility if growth-inducing projects are approved. The decision of whether impacts do occur, their extent, and the ability to mitigate them is appropriately left to consideration by the agency responsible for approving such projects at such times as complete applications for development are submitted.

7.3.1 Growth Variables

The timing, magnitude, and location of land development and population growth in a community or region are based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and nonresidential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Because the General Plan of a community defines the location, type, and intensity of growth, it is the primary means of regulating development and growth in California.

7.3.2 Growth-Inducing Impacts

Mechanisms by which a project may directly induce growth may include creating jobs that attract economic or population growth to the area, promoting the construction of homes that would bring new residents to the area, or removing an obstacle that impedes growth in the area. With implementation of the project, no change to staffing levels are proposed and the project does not include the construction of new homes. Therefore, the project would not directly bring new residents into the project area.

As described in Chapter 3, "Project Description," construction of the project, primarily related to installation of the required base liner containment system on 20-acres within the Triangle and excavation for the realigned drainage ditch segment along the southern boundary of the Triangle, would occur over the summer of 2021 and 2022. The project workforce would vary according to construction phase and type of facilities being constructed; however, the number of construction workers at any given time would be less than 30. In addition to on-site construction workers, additional workers would be involved in delivery of construction materials to the site. Deliveries of construction materials to and from the landfill would be limited, approximately 2 to 5 per day. This number of workers would be minor such that workers would likely come from the labor pool already available in the County and the region. No substantial relocation of workers would not be growth inducing.

Post-project operations and maintenance would not require any additional employees. Therefore, long-term operation of the proposed project would not result in workers relocating to the area and requiring housing, and would not be growth inducing. Additionally, the proposed project would not spur secondary job growth such as jobs or retail services to serve employees.

While expansion of a facility that serves both municipal and commercial customers in the region (San Francisco Bay Area and the Sacramento Valley) could remove an obstacle to growth, there are many other more influential factors affecting population growth than solid waste disposal capacity: land use, housing demand, employment, and availability of other basic services including water supply, wastewater treatment and disposal capacity, and roadway and highway access. These factors have a more direct role in encouraging or limiting population growth and landfill capacity is not currently considered a population growth constraint. In addition, expansion of the landfill is not expected to influence the location or rate of population growth in the landfill's service area. It is intended to maintain long-term solid waste disposal capacity within the region. The area surrounding the landfill is sparsely populated and construction or expansion of the facility would not attract new residential development to the surrounding area.

Because construction and operation of the project would not create a substantial number of jobs that would fuel economic or population growth, promote new residential construction, or remove an obstacle that impedes growth, the proposed project would not be growth inducing.

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