DOE/EA-1638

FINAL

ENVIRONMENTAL

ASSESSMENT

Environmental Assessment FOR DEPARTMENT OF ENERGY LOAN GUARANTEE TO SOLYNDRA, INC. FOR CONSTRUCTION OF A PHOTOVOLTAIC MANUFACTURING FACILITY AND LEASING OF AN EXISTING COMMERCIAL FACILITY IN FREMONT, CALIFORNIA

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APPENDICES

Appendix A Agency Correspondence

ACRONYMS AND ABBREVIATIONS

	Full Phrase
$\mu g/m^3$	micrograms per cubic meter
ACWD	Alameda County Water District
APE	Area of Potential Effects
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
CAA	Clean Air Act
Caltrans	California Department of Transportation
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulation
CIGS	copper indium gallium selenide
CMP	Construction Management Program
CWA	Clean Water Act
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMPSi	Environmental Management and Planning Solutions, Inc.
EPA	U.S. Environmental Protection Agency
EPAct 2005	Energy Policy Act of 2005
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
HOV	high occupancy vehicle
HVAC	heating, ventilation, air conditioning
IPCC	Intergovernmental Panel on Climate Change
LEED	Leadership in Energy and Environmental Design
mg/m^3	milligrams per cubic meter
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NOAA	National Oceanic and Atmospheric Administration
NWIC	Northwest Information Center
OCA	Optical Coupling Agent
OSHA	Occupational Safety and Health Administration

ACRONYMS AND ABBREVIATIONS

Full Phrase

$PM_{2.5}$	particulate matter with an aerodynamic diameter equal to or less than 2.5 microns
PM_{10}	particulate matter with an aerodynamic diameter equal to or less than 10 microns
PPE	personal protective equipment
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
ROI	region of influence
SVRTC	Silicon Valley Rapid Transit Corridor
SHPO	State Historic Preservation Office
TCO	transparent conductive oxide
TMDL	Total Maximum Daily Loads
USC	United States Code
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
URBEMIS 2007	Urban emissions 2007 model

EXECUTIVE SUMMARY

INTRODUCTION

The U.S. Department of Energy (DOE) is proposing to issue a loan guarantee in the amount of $535 million to Solyndra, Inc. (Solyndra) for (1) the construction of a photovoltaic manufacturing facility and accompanying administrative offices in Fremont, California; and (2) the leasing of an existing commercial facility for assembly and packaging of the photovoltaic panels within 25 miles of the proposed manufacturing facility.

DOE has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) (42 USC 4321, et. seq.) Council on Environmental Quality regulations for implementing NEPA (40 CFR Parts 1500-1508) and DOE NEPA regulations (10 CFR Part 1021). The EA examines the potential environmental impacts associated with the proposed action and alternatives and determines whether the proposed action has the potential for significant environmental impacts. The information contained in the EA will enable DOE to fully consider the potential environmental impacts of issuing a loan guarantee for the Solyndra project.

PURPOSE AND NEED

The Energy Policy Act of 2005 (EPAct 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAct 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that ‘‘avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued.” The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. The purpose and need for agency action is to comply with DOE’s mandate under EPAct 05 by selecting eligible projects that meet the goals of the Act. DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to Solyndra to support the proposed project. Solyndra has developed a breakthrough, thin-film

cylindrical photovoltaic module that substantially reduces the cost of electricity derived from solar sources. The Solyndra project would bring these photovoltaic panels to market and into use, making renewable, solar-generated electricity more available while avoiding emissions of air pollutants and anthropogenic greenhouse gases that would otherwise be produced by existing nonrenewable energy sources.

PROPOSED ACTION AND ALTERNATIVES

DOE's proposed action is to issue a loan guarantee to Solyndra for construction of the first phase of a photovoltaic manufacturing facility, administrative offices, a cafeteria, and a fitness center (altogether, referred to as "Fab 2"), and to lease an existing commercial facility for it's "Back End" facility, which would be the site of photovoltaic panel assembly and packaging. The completed Fab 2 and Back End facility combination would be capable of producing enough solar panels per year to produce 420 megawatts of electricity. The 609,650-square-foot Fab 2 would include 530,200 square feet of manufacturing plant floor area, 64,000 square feet of ancillary office space, an 11,450-square-foot cafeteria, and a 4,000-square-foot employee fitness center. The Fab 2 facility also includes non-habitable areas of 119,300 square feet of mechanical equipment enclosures and an 11,800-square-foot hazardous materials enclosure. At complete buildout, a 16,000-square-foot electrical substation would be built in the northeast corner of the project site to supply additional electrical power to run the Fab 2 facility. The building would range in height from 40 to 50 feet. Fab 2 would be constructed in two phases, each with 210 MW of production capacity. The first phase of the project would entail the construction of approximately 350,000 square feet of manufacturing plant floor area and the entire 64,000 square feet of office space. The second phase, starting in 2010, would complete the project and would be funded by Solyndra with other financial resources. Solyndra intends to construct the second phase of the project immediately upon completion of the first phase. This environmental assessment evaluates the impact of construction and operation of the completed 420 MW facility and the leasing and operation of the Back End facility.

DOE's proposed action is to issue a loan guarantee to Solyndra for this project. A no action alternative is also evaluated in this EA, which assumes Solyndra would not construct the Fab 2 facility and would not lease the Back End facility.

SUMMARY OF ENVIRONMENTAL EFFECTS

The EA evaluates the potential environmental effects that could result from implementing the proposed action and no action alternative.

Over its estimated 30-year projected life, Solyndra expects the proposed Fab 2 facility and Back End facility combination to produce photovoltaic

panels sufficient to generate 12.6 gigawatts of electricity under peak conditions. Over the life of these panels, they can be expected to generate over 400 trillion kilowatt-hours of emission-free electricity. Assuming that this capacity displaces electricity produced by conventional power plants and combined-heat-and-power plants, Solyndra estimates that the proposed development of the Fab 2-Back End facility combination would reduce greenhouse gases and other air pollutants as follows:

- 245 million metric tons of carbon dioxide;
- 1 million metric tons of sulfur dioxide; and
- 380 thousand metric tons of nitrogen oxides.

No significant adverse impacts on the resources examined in this EA, including environmental justice, were identified from construction and operation of the Fab 2 facility and the leasing and operation of the Back End facility. Leasing and operation of the Back End facility is not expected to have impacts on any resources compared with existing conditions at the unidentified existing commercial site. The proposed action would have minor direct and indirect beneficial impacts on socioeconomics from job opportunities, and beneficial impacts on global climate change and air quality by increasing the use of renewable solar energy and decreasing fossil fuel combustion.

The no action alternative would have no impacts on the resources evaluated in the EA but would not realize the beneficial impacts of bringing additional renewable energy capacity to market.

CHAPTER 1
PURPOSE AND NEED

1.1 PURPOSE OF AND NEED FOR ACTION

DOE's proposed action is to issue a loan guarantee in the amount of $535 million to Solyndra, Inc. (Solyndra) that would be used for construction of the first phase of a photovoltaic manufacturing facility, administrative offices, a cafeteria, and a fitness center (altogether, referred to as "Fab 2"), and to lease an existing commercial facility for its "Back End" facility, which would be the site of photovoltaic panel assembly and packaging.

The Energy Policy Act of 2005 (EPAct 2005) established a Federal loan guarantee program for eligible energy projects that employ innovative technologies. Title XVII of EPAct 2005 authorizes the Secretary of Energy to make loan guarantees for a variety of types of projects, including those that ''avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued." The two principal goals of the loan guarantee program are to encourage commercial use in the United States of new or significantly improved energy-related technologies and to achieve substantial environmental benefits. Rising energy prices and global climate change resulting from elevated greenhouse gases in the atmosphere provide further need for the accelerated commercial use of new and significantly improved energy technologies. The purpose and need for agency action is to comply with DOE's mandate under EPAct 2005 by selecting eligible projects that meet the goals of the Act. DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to Solyndra to support the proposed project.

Solyndra has developed a breakthrough, thin-film cylindrical photovoltaic module that substantially reduces the cost of electricity derived from solar sources. Financially supporting the Solyndra project would bring photovoltaic (PV) panels to market and into use, making renewable, solar-generated electricity more available while avoiding emissions of air pollutants and anthropogenic greenhouse gases that would otherwise be produced by existing nonrenewable energy sources. The location of the proposed Fab 2 facility is shown in Figure 1-1, Location of Proposed Solyndra Fab 2 Facility.

A recent study by Brookhaven National Laboratory concluded that "o*verall, all PV technologies generate far less life-cycle air emissions per GWh than conventional fossil-fuel-based electricity generation technologies. At least 89% of air emissions associated with electricity generation could be prevented if electricity from photovoltaics displaces electricity from the grid*" (Fthenakis et al. 2008).

Photovoltaic panels generate electricity without producing significant carbon emissions (except for emissions associated with panel production and installation). By displacing natural gas and other fossil fuels used to produce electricity, photovoltaic installations reduce generation of carbon dioxide (CO_2) and other greenhouse gasses. Over its estimated 30-year projected life, Solyndra expects the proposed combination of the Fab 2 facility and the Back End facility to produce photovoltaic panels sufficient to generate 12.6 gigawatts of electricity under peak conditions. Over the life of these panels, they can be expected to generate over 400 trillion kilowatt-hours of emission-free electricity. Assuming that this capacity displaces electricity produced by conventional power plants and combined-heat-and-power plants, Solyndra estimates that the proposed combination of facilities would reduce greenhouse gases and other air pollutants as follows:

- 245 million metric tons of carbon dioxide;
- 1 million metric tons of sulfur dioxide; and
- 380 thousand metric tons of nitrogen oxides.

Therefore, the Solyndra project would contribute to the avoidance and reduction of air pollutants and anthropogenic emissions of greenhouse gases, as required by EPAct 2005.

The project site is within an industrial area of southern Fremont, near the southeast end of San Francisco Bay.

Project Location Map

47422 Kato Road, Fremont, California

Figure 1-1

1.2 BACKGROUND

Title XVII of EPAct 2005 provides the basis of DOE's Loan Guarantee Program. This title provides broad authority to DOE to guarantee loans that support early commercial use of advanced technologies, if "*there is reasonable prospect of repayment of the principal and interest on the obligation by the borrower*." Loan guarantees are one way in which DOE promotes commercial use of innovative technologies. This tool is targeted at early commercial use only, rather than energy research, development, and demonstration programs. Accelerated commercial use of new or improved technologies will help sustain economic growth, yield environmental benefits, and produce a more stable and secure energy supply.

DOE published *Guidelines for the Loan Guarantee Program* in the Federal Register and issued a solicitation announcement in August 2006, inviting interested parties to submit project proposals that meet the Title XVII statutory requirements and also contribute to the goals of the President's *Advanced Energy Initiative*. The Advanced Energy Initiative, issued in February 2006, aims to reduce U.S. reliance on foreign sources of energy by changing the way Americans fuel their vehicles and power their homes and businesses. DOE received 143 pre-applications in December 2006. From April to August 2007, DOE's Loan Guarantee Program Office (LGPO), with assistance from DOE program offices, conducted technical and financial reviews of the pre-applications.

On October 4, 2007, DOE invited 16 of the 143 pre-applicants to submit applications for loan guarantees. These 16 were selected on the basis of the completeness of their application and the overall merit of their technologies. Solyndra accepted DOE's invitation to submit an application for a loan guarantee for construction of a photovoltaic manufacturing facility and leasing of an existing commercial facility in Fremont, California. DOE is performing a disciplined and rigorous review of Solyndra's submittal documentation to take account of the financial risk of the project.

1.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This EA presents information on the potential impacts associated with guaranteeing a loan to Solyndra and covers the construction and operation of the completed 420 MW facility and the leasing and operation of the Back End facility. DOE has prepared this EA in accordance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500−1508), and DOE NEPA Implementing Procedures (10 CFR 1021). If no significant impacts are identified during preparation of this EA, DOE will issue a Finding of No

Significant Impact (FONSI). If potentially significant impacts are identified, DOE will prepare an environmental impact statement (EIS).

This EA: (1) describes the affected environment relevant to potential impacts of the proposed action and no action alternative; (2) analyzes potential environmental impacts that could result from the proposed action; (3) identifies and characterizes cumulative impacts that could result from the proposed action in relation to other ongoing or proposed activities within the surrounding area; and (4) provides DOE with environmental information for use in decision-making to protect, preserve, and enhance the human environment and natural ecosystems.

1.4 DOCUMENT ORGANIZATION

This EA has been organized into the following sections. A list of acronyms and abbreviations follows the Table of Contents.

Chapter 1, Purpose and Need, describes the purpose of and need for the proposed DOE action, the background of the Loan Guarantee Program, and the scope of the analysis. It also describes the organization of the EA.

Chapter 2, Proposed Action and No Action Alternative, discusses the proposed action, alternatives considered, and the no action alternative.

Chapter 3, Affected Environment, describes the existing baseline conditions of the resources that may be affected by implementing the proposed action, including land use, visual resources, air quality, noise, geology and seismicity, water resources, biological resources, cultural resources, socioeconomics and environmental justice, public health and safety, and transportation.

Chapter 4, Environmental Consequences, describes potential social, economic, and environmental effects associated with the proposed action and no action alternative described in Chapter 2. A discussion of cumulative effects is also provided.

Chapter 5, List of Preparers, provides a brief description of credentials for the preparers of the EA.

Chapter 6, List of Agencies Contacted, provides a list of agencies contacted regarding this EA.

Chapter 7, References, describes the sources of information used in preparing the EA.

CHAPTER 2
PROPOSED ACTION AND ALTERNATIVES

This chapter provides information on Solyndra's product and discusses the proposed action, alternatives considered, and the no action alternative.

2.1 INTRODUCTION

Solyndra is a U.S.-based manufacturer of photovoltaic (PV) panels. Solyndra's technology is unique in that it uses proprietary cylindrical modules, which optimize the collection of sunlight and enable the highest rooftop coverage without the need for costly mounting hardware or rooftop penetrations. By significantly reducing installation costs and increasing the electricity generated per rooftop, Solyndra believes that its panels can generate the greatest amount of solar electricity at the lowest cost per kilowatt hour for a typical installation.

Solyndra's technology strategy incorporates the thin film semiconductor material copper indium gallium diselenide ("CIGS") into a proprietary solar PV manufacturing process optimized for large-scale commercial rooftop applications. The technology uses a hollow glass tube as the substrate and hermetically seals that tube in a larger protective outer glass tube, while adding an optical coupling agent (OCA) between the tubes to increase the amount of light incident on the PV modules. These modules are then fabricated into an easily deployable PV panel with a very low wind profile that is optimized for low-slope, semi-reflective rooftop applications that typify large-scale commercial rooftops. Figure 2-1 is an illustration of an individual mounted panel.

Figure 2-1 Solyndra Panel and Mount

The basic element of Solyndra's technology is an "omnifacial" cylindrical cell, so named because it is completely circumferentially covered with CIGS thin film cell materials and thus collects light on all sides. The omnifacial cylindrical cell optimizes the collection of *all available direct, diffuse, and reflected sunlight*. Because the sun sees the same cell geometry throughout the day, an omnifacial cell is *inherently self-tracking* for collection of direct light, without any additional tracking hardware. Diffused light is collected from all angles. Reflected light is also efficiently collected by the downward-facing area of the cell.

Solyndra's initial market target segment for its PV products is commercial-scale installations on large, flat, reflective roofs such as those found on commercial, industrial, and governmental buildings. Solyndra estimates that approximately 50 percent of its business will be in the US and 50 percent will be in Europe. Although both of these regions will be part of the business in years beyond, the exact fraction depends on each market and uptake agreements. Figure 2-2 shows Solyndra's panels in a rooftop installation.

The proposed site for the Front End manufacturing Facility (Fab 2) is a 30-acre parcel located at 47422 Kato Road in Fremont, California. The site is approximately one quarter of a mile from Solyndra's headquarters at 47700 Kato Road (Fab 1). Solyndra is in the process of completing expansion of its Fab 1 facility, which will have an annual nameplate manufacturing capacity of 110 MW and which is currently producing panels at an annual run rate of approximately 10 MW. The Solyndra Fab 2 production line design will benefit from the expertise and learning

gained during the design and construction of the Fab 1 facility's 110 MW line. The Solyndra Fab 2 production lines will use substantially the same manufacturing machinery designs and process flows as those at Fab 1 and will thus benefit from the experience gained during the expansion of Fab 1; however, Fab 1 and Fab 2 will be separate facilities.

Figure 2-2 Solyndra Rooftop Installation

Solyndra's second fabrication facility will have an annual nameplate manufacturing capacity of 420 MW. Fab 2 will be constructed in two phases, each with 210 MW of production capacity. In Phase 1, which is intended to be financed in part by a loan guarantee from DOE, the 30-acre project-site parcel will be purchased and an approximately 400,000-square-foot fabrication facility will be constructed to house the "Front End" manufacturing activities. Additionally, approximately 150,000 square feet of an approximately 300,000 square foot leased facility will be improved to house the so-called "Back End" manufacturing activities. Solyndra anticipates that the Front End facility will be expanded under a Phase 2 starting in 2010, and a facilities sharing agreement will be entered into between the Phase 1 entity, covered by the guarantee, and the Phase 2 entity. It is currently anticipated that the Phase 2 entity will lease a separate facility from that used by Phase 1 for Back End manufacturing activities; however, a facilities sharing agreement will be entered into between Phase 1 and Phase 2 if it is determined that they should share a leased Back End facility. Phase 1 and Phase 2 will be structured as discrete corporations, fully owned by Solyndra, Inc. (the Solyndra Fab 2 Project Sponsor).

2.2 PROPOSED ACTION

DOE's proposed action is to issue a loan guarantee to Solyndra for construction of the first phase of a photovoltaic manufacturing facility, administrative offices, a cafeteria, and a fitness center (altogether,

referred to as "Fab 2"), and to lease an existing commercial facility for it's "Back End" facility, which would be the site of photovoltaic panel assembly and packaging. Solyndra plans to develop a 30-acre vacant portion of a 42.8-acre parcel at 47422 Kato Road, Fremont, California, for the Fab 2 facility, and to lease an additional 300,000 square feet within 25 miles of the Fab 2 facility for finishing processes on the products and packaging at the Back End facility.

2.2.1 Construction of Front End Facility and Offices (Fab 2)

The Front End process would transform bare glass tubes into functional photovoltaic modules. A new building, named Fab 2, would be constructed to contain this Front End process, administrative offices, a cafeteria, and a fitness center. Fab 2 would contain six production lines capable of producing 420 megawatts per year of solar panels. Fab 2 would be located at 47422 Kato Road, approximately one-quarter mile from Fab 1, Solyndra's existing manufacturing facility, and the attached Solyndra headquarters, at 47700 Kato Road.

The 609,650-square-foot Fab 2 facility would include 530,200 square feet of manufacturing plant floor area, 64,000 square feet of ancillary office space, an 11,450-square-foot cafeteria, and a 4,000-square-foot employee fitness center. The facility also includes non-habitable areas of 119,300 square feet of mechanical equipment enclosures and an 11,800-square-foot hazardous materials enclosure. At complete buildout, a 16,000-square-foot electrical substation would be built in the northeast corner of the project site to supply additional electrical power to run the facility. The first phase of the project would entail the construction of approximately 350,000 square feet of manufacturing plant floor area and the entire 64,000 square feet of office space. The manufacturing portion of the project would be a 42-foot-high, single-story building with a mechanical and service mezzanine. The two-story office building would also be 42 feet high.

Construction of the new facility is projected to take approximately 9 months, followed by an additional 14 months of interior equipment installation and finishing. The facility would have six production lines at full buildout. The first production line is programmed to be online by the beginning of 2010, with one additional production line coming online each quarter. The full buildout is anticipated to occur in the second quarter of 2011. Each production line would require approximately 20 employees. As a function of the phasing of the production lines, the projected 120 manufacturing employees would not be reached until full buildout has been achieved.

The project design is intended, at a minimum, to achieve Leadership in Energy and Environmental Design (LEED) Silver certification. The building design for the facility features a two-story floor plan with high

ceilings and a mezzanine designed to accommodate floor-level and suspended overhead assembly-line manufacturing machinery. The project includes water recycling measures for cooling purposes to reduce water consumption by 25 percent. The highest point of the roofline of the plant would measure slightly more than 42 feet above the finished floor elevation. The office portion of the facility also contains two floors, but features separate architecture from the plant portion of the facility. The plan for the office portion features irregularly shaped rooflines with the highest point consisting of an architectural element at the front corner measuring approximately 50 feet above the finished floor. The utility/mechanical equipment enclosures and hazardous materials enclosure would contain two levels and would measure approximately 38 feet to the top of the roof. Solar panel arrays would be installed on the rooftop of the building, for a total of approximately 25,777 panels to be installed over the entire facility (each panel is approximately 3 feet wide by 6 feet long), with a power generation capability of up to 3 megawatts. The building design features post-industrial architecture with straight parapets, louvered metal and composite panel siding and translucent polycarbonate glazing on the plant portion, and glass curtain walls and irregularly angled metal roofs on the office portion.

Solyndra plans to grade the site to create a level surface for the building, parking/circulation, and delivery service areas. This would require total grading in the amount of 101,000 cubic yards of cut and 75,000 cubic yards of fill. A total of 546 parking spaces would be provided on the site. Solyndra has indicated a potential future need for structured parking in its business plan, so the rearmost portion of parking lot in the southeast comer of the site would be made available for a future parking structure should the need arise. Access to the site would consist of a new main driveway off of Kato Road and use of an existing driveway on the north side of the site that runs parallel to an Alameda County Flood Control District channel. The driveway and flood control channel will remain in their present locations and would provide access to the proposed substation, loading docks, and mechanical equipment and hazardous materials enclosures on the back side of the proposed facility. A stormwater detention basin is proposed at the front of the site between the building and the property line. Decorative landscaping would be provided around this detention basin, as well as throughout the parking areas and along the perimeter of the site. The existing berm would be raised 3 to 4 feet to create adequate depth within the proposed stormwater detention basin, and the existing London Plane trees located along the front property line would be removed and replaced with a new row of the same species.

Emissions, Effluents, and Waste Streams

Estimates of air emissions for the construction of the project are provided in Table 4-1 in Section 4.4 of this EA. Water effluent during the phase would be limited to stormwater runoff. A stormwater pollution prevention plan would be developed as part of the General Construction Stormwater Permit that would be obtained prior to construction. It is anticipated that stormwater would be contained on site.

The City of Fremont has approved a Mitigated Negative Declaration (MND) for the project under the California Environmental Quality Act. The MND requires that prior to issuance of a permit the following measures shall be included in a dust control plan and noted on construction plans with the contact information for a designated contact person responsible for the on-site implementation of the dust control plan:

- water all active construction and site preparation work areas at least twice daily and more often during windy periods;
- cover all hauling trucks or maintain at least 2 feet of freeboard on all loads;
- pave, apply water at least twice daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas, and staging areas;
- sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas, and sweep streets daily with water sweepers if visible soil material is deposited onto adjacent roads;
- apply hydroseed or non-toxic soil stabilizers to inactive construction areas (i.e., previously graded areas that are inactive for 10 days or more);
- enclose or securely cover exposed stockpiles;
- replant vegetation in disturbed areas as quickly as possible; and
- suspend construction activities that cause visible dust plumes to extend beyond the construction site.

2.2.2 Leasing and Operation of Back End Facility

Back End operations include photovoltaic module finishing, panel framing, and packaging processes. To reduce manufacturing costs and upfront capital requirements, Solyndra is taking advantage of the fact that the Back End processes do not require the significant special-purpose design functionality required by Front End operations. Numerous existing commercial properties are appropriate to house Back End manufacturing processes.

The Back End facility will create a maximum of 360 employees in both manufacturing-related functions and office-related functions. The Back End facility will have two 12-hour shifts, starting at 6:00 AM and 6:00 PM, with 130 employees on each shift. The office will have approximately 100

employees. Manufacturing operations will occur 24 hours a day, 7 days a week.

The Back End facility would consume the following resources at the rates indicated:

- electrical power demand (peak load) = 12 MW
- electrical power consumption = 7,274,400[2] kWh/month
- natural gas consumption = 18,000 Therms/month
- city water = 100 gallons per minute or 4,364,640 gallons/month

Approximately 28 truck trips per week would deliver modules from the Front End facility to the Back End facility. An additional 37 truck trips per week would deliver raw materials and chemicals to the Back End facility (this includes one tanker trip per week, carrying Optical Coupling Agent solution). Output of finished panels would be transported over approximately 55 trips per week, likely on 40-foot trailers.

Waste streams originating from the Back End facility are shown in Table 2-1.

Table 2-1
Waste Stream Pickups from Back End Facility

Waste Stream	Disposal Methodology	Truck/Trailer	# of Trips
Debris with isopropyl alcohol, trace metals	Fuel blend prior to engineering recovery	Truck	1/month
OCA Solution	Fuel blend prior to engineering recovery	Truck	1/month
Aluminum frame	Recycling	Truck	1/month
Santoprene harness			
End caps			
OCA contaminated outer/inner tubes	Crusher onsite & sent for reclaim/recycle	40 ft trailer	8/month
Non-OCA contaminated CIGS inner tube			
Non-OCA contaminated clean outer tube			
Acrylic tube	Plastics recycling	40 ft trailer	1/month

Source: Solyndra 2008
Notes: OCA = Optical Coupling Agent
CIGS = copper indium gallium selenide

The proposed Back End facility would involve leasing 300,000 square feet of existing commercial property within an approximate 25-mile radius of the Fab 2 site. Solyndra would select a feasible site that is as close to Fab 2 as possible; therefore, it is likely that the given facility would be

[2] (10 MW average demand) x (1000 kW/MW) x (24 h/day) x 7 (day/week) x (4.33 weeks/month) = 7,274,400 kWh/month

located in the greater Fremont-Milpitas area. DOE does not anticipate significant impacts related to the Back End Facility; however, once a site is selected, DOE will undertake review, as appropriate, to determine if a supplement to this EA is necessary.

In the Front End manufacturing processes, a thin film of semiconductor material is deposited onto glass substrates. In the Back End manufacturing processes, the cylindrical tubes are assembled and the tubes are packaged into aluminum frames. The Back End manufacturing processes, which are entirely automated, include the following steps: (1) electrical modules from the Front End are cut to one-meter lengths and an expansion bag is inserted inside the tube; (2) an electrical contact is connected to each end of the tube, and the tube is inserted first into an acrylic safety tube and then into a protective outer glass tube; (3) the tubes are filled with a fluid that magnifies sunlight into the tube, and the ends are sealed; (4) the finished tubes are pressed into rubber harnesses and framed with aluminum sides; and (5) panels are then packaged for shipping. There are no emissions associated with the Back End process other than those related to vehicle traffic.

2.2.3 Operation of Fab 2

Details of the Front End Process

Solyndra uses common thin-film manufacturing concepts for solar modules that result in monolithic integration, where the cell is created directly on a glass tube and the electrical connections are developed *in situ* (see Figure 2-3). Modules are manufactured by sequential depositions of different thin films onto cylindrical glass substrates. The substrate manufacturing process begins with a thorough cleaning of the glass substrate followed by a molybdenum (“Moly”) deposition, establishing a back contact that serves as an electrode, and then a CIGS absorber layer formation. To interconnect and isolate the cells, laser and mechanical scribing steps are employed. Next, a buffer layer of cadmium sulfide separates the CIGS from a transparent, high-conductivity layer (TCO or transparent conductive oxide) that interconnects the cells defined by the first scribe. A final scribe separates the solar cells. The result, yielding between 100 and 300 solar cells per glass cylinder, is a module. Forty modules comprise a Solyndra PV panel.

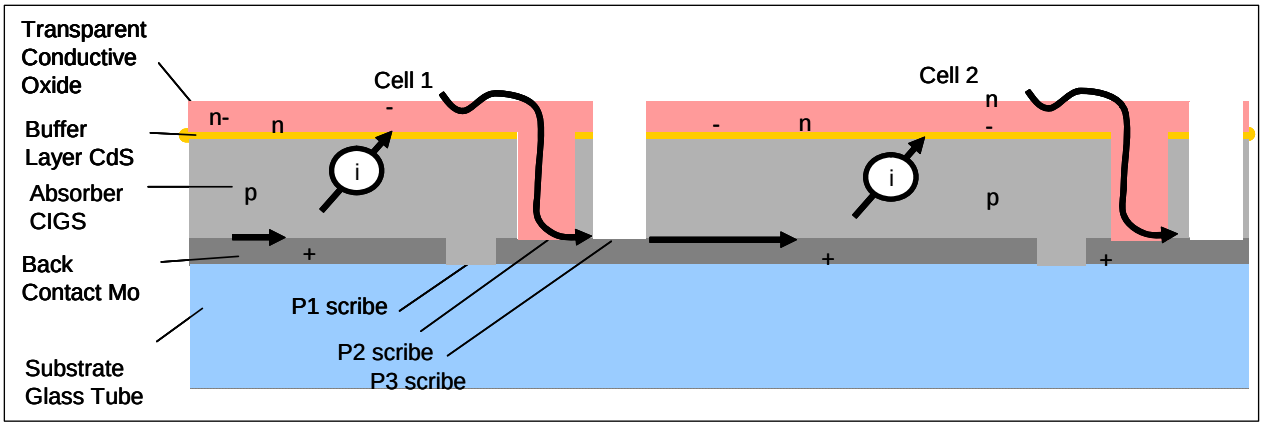


Figure 2-3 Monolithic Integration Schematic

The Front End processes include four basic technologies, the first three of which generate their own waste streams (shown in *italics*):

- **Glass cleaning** using standard ultrasonic bath and surfactant technology. *This step creates a liquid waste that is corrosive in nature and is treated by the Acid Waste Neutralization system.*

- **CIGS, Moly, and TCO thin film deposition** in large (up to 100-foot-long) in-line vacuum systems using physical vapor deposition and evaporation techniques. *The exhaust for the CIGS process is emitted into the atmosphere after passing through HEPA filters and a strobic exhaust fan system.*

- **Chemical Bath Deposition** in which a controlled thickness of cadmium sulfide is grown on the tube surface by immersing it in a tray containing a precise chemical mixture at a controlled temperature. *This step creates a liquid waste stream containing cadmium, which is extracted by an ion exchange resin system followed by neutralization by an acid waste neutralization system.*

- **Patterning of the deposited films** using either lasers or mechanical scribes to define solar cells and interconnect them.

All manufacturing machinery for Solyndra Fab 2 will be custom built for the unique form factor of Solyndra's components, but all will use standard industrial processes employed in many other industries, including the manufacture of semiconductors, storage media, flat panel displays, and architectural glass. Solyndra has a team of engineers from the semiconductor and hard drive industries with extensive experience in designing, manufacturing, and ramping up similar facilities.

Employees, Access, and Parking

The proposed project will create a maximum of 590 employees in the Fab 2 Front End facility and administrative offices. The Front End facility will

have two 12-hour shifts, starting at 6:00 AM and 6:00 PM, with 120 employees on each shift. The office portion will have between 150 and 350 employees. Manufacturing operations will occur 24 hours a day, 7 days a week.

Site access would be from Kato Road. The existing driveway on the north edge of the project site would be the primary access point for truck traffic. A new driveway on the south edge of the property would be used to access the large employee parking lot on the south side of the building. This driveway would provide access around the rear of the site and tie into the existing driveway on the north side.

The City of Fremont requires 982 parking spaces based on the square footage of the proposed facility. Solyndra is in discussion with the City of Fremont to reduce the number of required parking spaces based on proposed carpooling, transit use, and shuttle buses that are part of Solyndra's developing commuter program. This commuter program is discussed later under Section 3.4, Air Quality. A total of 546 parking stalls would be provided at grade. Land banking would also be provided for the potential future construction of a parking structure, should the City of Fremont not approve the reduced parking proposed by Solyndra.

Truck deliveries would be scheduled in a manner to avoid deliveries during peak traffic hours. Shifts for the manufacturing staff are scheduled at 6:00 AM and 6:00 PM. Office staff would work 8:00 AM to 6:00 PM.

Water Use

Peak water demand without reuse or recycling is 900 gallons per minute (1,296,000 gallons per day) for Fab 2, and average water demand would be half of that number at 450 gallons per minute (648,000 gallons per day). Solyndra is committed to implementing an initial water recycle/reuse system in order to achieve a nominal 25 percent reduction in city water demand under normal operations. Recycling and reusing wastewater in mechanical support systems (cooling towers, fume scrubbers, etc.) would be primarily employed in order to meet this reduction. Current projections for an average city water demand after implementation of the reuse/recycling program is 325 gallons per minute (468,000 gallons per day). Alameda County Water District (ACWD) has indicated it would provide only a single service to the site. This service would be sized to support the full peak water demand for Fab 2 of 900 gallons per minute.

The ACWD is planning to expand its utilities to include separate piping for reclaimed water. Solyndra is committed to utilizing this water to supply the cooling towers when it becomes available. The water system for Fab 2 would be designed for use of this future water source. This use of reclaimed water is projected to result in a 40 percent reduction in city water demand under normal operations (current cooling tower demand is

nominally estimated at 180 gallons per minute [260,000 million gallons/day] without in-plant recycle); therefore, projected water demand in the future would be reduced to 270 gallons per minute, or 388,000 gallons per day. The details of water demand with and without recycling are provided in Table 2-2, Fab 2 Water Inputs.

In addition to the manufacturing demand reductions, all landscaping would be drought tolerant with drip irrigation. Also, low-flow fixtures would be employed.

Table 2-2
Fab 2 Water Inputs (gallons per day)

	Prior to Availability of ACWD Recycled Water	Once ACWD Recycled Water Becomes Available
Solyndra System Demand	**648,000**	**648,000**
On-site Recycling	180,000	180,000
Non-potable Recycled Water from ACWD	0	80,000
Potable Water from ACWD	468,000	388,000

Emissions, Effluents, and Waste Streams

Stormwater Runoff

The impervious area of the project site would be approximately 991,348 square feet. A soil investigation prepared for an adjoining property indicates that area soils have low permeability, rendering the site inappropriate for pervious pavement as a stormwater reduction strategy. A soil investigation of the Solyndra site prepared in October 2008 confirms this assessment, indicating that the Solyndra site and the larger surrounding area rest on Pleistocene-age alluvial fan deposits, which contain poorly drained clayey sands and gravels (Solyndra, Inc. 2008).

The project would be subject to the regulations and controls of the San Francisco Bay Regional Water Quality Control Board's C.3 stormwater standards for on-site treatment of stormwater runoff prior to entering the public storm drain system. C.3 is a provision of the Alameda Countywide Municipal Stormwater National Pollution Discharge Elimination System (NPDES) permit that requires each discharger to control the flow of stormwater and stormwater pollutants from new development and redevelopment sites.

Solyndra proposes to treat stormwater with a combination of bioswales[3] and detention basins to treat and hold stormwater.

Liquid
No releases to the environment of liquid wastes would occur. Liquid wastes would be generated, processed, and moved off-site via sanitary sewer or hazardous waste handlers.

Cadmium waste would be extracted from the water stream and trapped in Ion Exchange Resin Filters. These filters would be regenerated three times each year by the supplier. The captured cadmium would be extracted and either recycled or disposed of by the supplier per Resource Conservation and Recovery Act requirements. Solyndra is currently in discussions with appropriate filter suppliers.

Fab 2 would have a peak wastewater flow to the Union Sanitary District sanitary sewer of approximately 800 gallons per minute, with an average flow of 450 gallons per minute. Water conservation measures would reduce these amounts. Solyndra would upgrade the sewer line at the site from the existing 10-inch-diameter line to a new 15-inch-diameter line to accommodate the peak flow.

The site would be designed to contain stormwater flows on-site, with appropriate treatment measures put in place.

Air
Process-related air releases would be limited to ammonia and hydrochloric acid vapors that would be passed through an air scrubber. After abatement with the scrubber, it is expected that approximately 1,242 pounds of ammonia and 74 pounds of hydrochloric acid vapor would be released to the atmosphere per year. An air permit would be obtained for the six exhaust scrubbers (three that would remove hydrochloric acid and three that would remove ammonia from the air exhaust stream) and the operation of electronic parts cleaning.

The emergency diesel generator would also generate emissions of criteria pollutants when running. The generator would only operate during routine maintenance and testing and during emergencies. An air permit would be obtained for this generator, and emissions would be regulated under that permit.

Commuter Program
Solyndra is developing a commuter program to reduce traffic and emissions through encouraging employees to use public transit systems such as BART/ACE. The program is considering the following:

[3] Bioswales are landscape elements designed to remove silt and pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides (less than six percent) and filled with vegetation, compost, and/or riprap.

- A shuttle service from local BART/ACE stations to their campuses on Kato Road and Kato Terrace;
- Inter-campus shuttles;
- Flex spending accounts for employees (similar to medical flex), which would defer pre-tax dollars for commuting fees, bridge tolls, etc.; and
- Corporate BART passes.

Energy Consumption

Fab 2 would have an estimated peak electricity usage of 28 to 30 megawatts. Fab 2 would be designed in accordance with the basic guidelines for LEED certification. Solyndra expects to obtain at least Silver Certification and would achieve Gold Certification, if possible. Over the longer term, up to 75 percent of the facility's roof is intended to be covered with Solyndra-manufactured solar panels, which would offset some of the facility's energy needs from the grid. Other energy conservation measures that would be incorporated into the facility include the following:

- variable frequency drives for fans and pumps, as well as large equipment chillers and cooling towers and air compressors;
- occupancy sensors for lighting; and
- energy-efficient lighting.

Hazardous Materials Use and Storage

The facility would include the use and storage of hazardous materials. Table 2-3, Material Resources to be Used and Transported, lists these materials, how they would be transported to the facility, and their physical state (solid, liquid, gas).

Waste Treatment and Disposal

Multiple waste streams would leave Fab 2 once it is operational, as described below. Each waste material, its quantity, and the strategy to minimize the impacts of each waste stream are detailed in Table 2-4, Potential Waste Streams.

Wastewater

Wastewater would be generated from cooling, cleaning, and plating processes. This wastewater would be discharged to the on-site Elementary Neutralization treatment system, which would adjust the pH of the solution to neutral (pH 7), and to the on-site Ion Exchange treatment system, which would remove cadmium ions from solution, to meet the discharge limits of the Alameda County Union Sanitary District before being discharged to the community sewer.

Table 2-3
Material Resources to be Used and Transported

Material Resource	Physical State	Transportation
Acetone	Liquid	Trucks
Ammonium hydroxide 28-30%	Liquid	Tankers
Thiourea	Solid	Trailers
2-Propanol (iso-propyl alcohol)	Liquid	Trucks
Hydrochloric acid 37%	Liquid	Tankers
Cadmium sulfate hydrate	Solid	Trucks
Deconex OP 140	Liquid	Trucks
Deconex OP 171	Liquid	Trucks
Sulfuric acid 96%	Liquid	Tankers
Sodium hydroxide 30%	Liquid	Tankers
Copper	Solid	Trucks
Indium	Solid	Trucks
Gallium	Solid	Trucks
Selenium	Solid	Trucks
Ethylene glycol	Liquid	Trucks
Nitrogen, refrigerated liquid	Liquid	Trucks
Argon, compressed	Gas	Trucks
Molybdenum	Solid	Trucks
Helium, compressed	Gas	Trucks
Oxygen	Gas	Trucks
Deionized water	Liquid	Utility pipeline
Aluminum	Solid	Trucks
Glass	Solid	Trailers
City water	Liquid	Utility pipeline

Cadmium

Cadmium waste would be extracted from the water stream and trapped in Ion Exchange Resin Filters. These filters would be regenerated three times each year by the supplier. The captured cadmium would be extracted and either recycled or properly disposed of by the supplier. Solyndra is currently in discussions with appropriate filter suppliers.

Glass and Manufacturing Waste

Normal manufacturing waste and scrap material would create up to two tons per day of glass waste with films of molybdenum, copper indium gallium selenide (CIGS), cadmium sulfide, and zinc oxide. Solyndra's contracts with the suppliers of these raw materials stipulate that they will accept waste material for reprocessing and recycling. Any heavy metal waste that is not able to be reprocessed or recycled would be disposed of by the suppliers in a hazardous waste landfill. Currently, Solyndra recycles materials from panels that do not pass inspection, particularly glass and the aluminum frames for the panels.

Table 2-4
Potential Waste Streams

Waste Stream	Mitigation Strategy	Potential Minimization Strategy	Estimated Quantity
Aqueous liquid with cadmium	Treated on-site – Ion Exchange	Reduce/separate/ concentrate	69,840 gallons/day
Base waste pH 9 – 12.5	Treated on-site – Industrial Waste Neutralization	Reuse	115,200 gallons/ day
Debris with solvents/metals	Transfer off-site	Reduce	1,400 lbs/month
Broken glass	Landfill or surface impoundment	Reclaim/recycle	1,300 lbs/month
Broken glass contaminated with heavy metals	Macro encapsulate for disposal off-site	Reclaim metals, recycle	6,000 lbs/month
CIGS-coated stainless steel plates	Stabilization for disposal off-site	Reduce	1,400 lbs/month
Debris with hydrochloric acid	Landfill or surface impoundment	Reduce	800 gallons/month
Minncare sterilant spill debris	Landfill or surface impoundment	Reduce	600 lbs/month
Empty drums	Other recovery or reclamation	Reduce	1,000 lbs/month
Bead blast media with CIGS	Stabilization for off-site disposal	Reduce	600 lbs/month
Cadmium filters	Transfer off-site	Reduce	800 lbs/month
(1012) Acetone and isopropanol solution	Fuel blend prior to energy recovery	Reduce	120 lbs/month
Nitric acid with RCRA metals	Transfer off-site	Reduce	150 lbs/month
Stormwater	Treat with bioswales and detention basins, then discharge to sewer	Treat, delay discharge	8.9 million gallons per year

Notes: RCRA – Resource Conservation and Recovery Act

Hydrochloric Acid and Ammonia Vapor

Hydrochloric acid and ammonia vapor from plating processes would be trapped in scrubbers; ammonia would use an acid scrubber, and hydrochloric acid would use a water scrubber. The scrubber overflow would enter the on-site acid waste neutralization system and join the wastewater flow.

Solvents

A small amount of solvents may be used to clean equipment. This would be shipped off-site to a hazardous waste disposal service.

PV Panels

Fab 2 would produce approximately one million panels each year. At this rate, over the lifetime of the Fab 2 facility, it is estimated that 20 million panels would be produced. At the end of the lifetime of these panels, they would become waste. The photovoltaic panels are not considered hazardous waste. All cadmium within the panels is layered between other

materials within glass tubes and does not pose a hazard to human health or the environment, even when the panels are broken. Acid leach tests (Toxicity Characteristic Leaching Procedure) have been performed on broken tubes to simulate potentially acidic conditions in landfills that could result in the leaching of metals out of broken panels and into water supplies. The tests investigated the potential for cadmium, copper, and selenium to leach out of broken panels. Cadmium results ranged from 0.39 to 0.58 mg/L, which are below the U.S. Environmental Protection Agency limit of 1.0 mg/L. Copper and selenium came out at non-detectable levels (TestAmerica 2008).

Solyndra has been evaluating methods to provide its customers an option for return and safe disposal of the product after an early decommissioning or at the end of its useful life of approximately 30 years. Solyndra is currently in talks for reclaim/recycling options with smelters (Xstrata in Canada) and is developing a product take-back program with Veolia that would be active once product begins to be shipped to customer sites.

Best Management Practices

The Fab 2 facility would employ the measures described below to reduce environmental and safety impacts from the hazardous materials used and produced in the facility.

Bulk Chemical Delivery System

- Double-contained piping;
- Continuous leak detecting and monitoring;
- Exhaust ventilation on process tanks, and pump cabinet exhausts plumbed to facility fume scrubber;
- All waste streams and containment drains plumbed to the facility wastewater treatment system;
- High-hazard occupancy-rated dedicated bulk rooms with tertiary containment;
- Fill system equipped with automatic shutoff valves designed to shut off when the fill tanks are full;
- Tank overflow piping continuously open to treated drain to capture any overflow;
- Personnel required to wear PPE to avoid contact exposure; and
- All personnel specifically trained in operation of the systems and emergency response.

Scrubber Exhaust and Fume Scrubber

- Dual fan system with 100-percent redundancy;
- Continuous monitoring of scrubber pH with alarm to Facility Management System; and
- Continuous gas monitoring at the stack discharge to monitor performance of scrubber.

Wastewater Treatment System

- Continuous monitoring of the discharge to ensure discharge is within discharge specifications;
- Double-contained piping and tanks for treatment chemicals;
- Waste treatment tanks are within a secondary containment pit; and
- Continuous leak detection and monitoring in secondary containment.

All Systems

Engineering controls for the proposed Fab 2 are designed to ensure that no single point of failure could result in an unsafe condition or environmental release. This includes accounting for human error. The systems are designed for automatic operation with human interface only in a monitoring capacity.

The entire Fab 2 facility would be under 24-hour camera surveillance. All areas of the buildings would be access controlled, with security performing regular rounds. All authorized personnel (employees and contractors) would be issued access key fobs to regulate entry into the facility, including office and processing areas.

2.2.4 Decommissioning

Solyndra expects the structural components of the Fab 2 facility to have a lifespan of approximately 30 years. If Solyndra still owned the property and wished to continue operations at the site beyond the lifespan of the structure, either renovations or demotion-and-rebuild of the facility would be required. Both of these options would generate waste that would be disposed of and/or recycled according to existing recycling technologies and markets and disposal regulations at the time of demolition or renovation.

Solyndra understands that photovoltaic technologies are evolving quickly and that the current production methods may be replaced with newer technologies. As such, proposed operations at Fab 2 are expected to continue for approximately 20 years. Should Solyndra decide to take on commercial production of a newer technology prior to the end of the structural lifetime of the building, Solyndra would replace the production lines with whatever new technology has been adopted, while the outside of the building and the building itself would likely remain largely unchanged. Production line components would be sent for recycling and disposal depending on the markets for these materials and the disposal regulations in place at that time.

Should Solyndra choose to cease operations at Fab 2 prior to the end of the building's lifespan, it would likely remove all production line materials, leave the structure of the building as is, and sell the property on the open market.

2.2.5 Permits and Authorizations

The permits and authorizations listed below would need to be completed prior to the initiation of groundbreaking or construction activities.

California Environmental Quality Act Compliance – City of Fremont

The California Environmental Quality Act (CEQA) (Pub. Res. Code §21000 *et seq*.) requires state and local public agencies to identify the environmental impacts of proposed projects, determine if the impacts will be significant, and identify mitigation measures that will substantially reduce or eliminate those impacts. To comply with CEQA, an agency must first prepare an initial study, assessing whether a project may have significant environmental impacts. If so, the agency must prepare an environmental impact report. If not, the agency must prepare a Negative Declaration. If the project would have significant environmental impacts but those impacts may be mitigated to a level of less than significant, then the agency must prepare a Mitigated Negative Declaration. The lead agency is responsible for consulting with and obtaining comments from other public agencies and members of the public with regard to the environmental effects of projects.

The City of Fremont is the lead agency for compliance with CEQA for the Solyndra project. At a hearing on November 3, the City of Fremont adopted the Mitigated Negative Declaration (MND) for the project (Appendix A).

Zoning Administrator Permit – City of Fremont

A Zoning Administrator Permit would be required to allow the following:

- an increased Floor Area Ratio;
- Fab 2 to be a Large Use for hazardous chemicals;
- for the building height, which would be greater than 40 feet but no more than 50 feet; and
- for reduced parking capacity (546 spaces instead of 982).

Lot Line Adjustment – City of Fremont

A lot line adjustment or tentative parcel map would be required to create a separate legal parcel of approximately 30 acres for the Fab 2 facility. The necessary mapping would be done by the existing property owner.

Stormwater Permit – State Water Resources Control Board

Since the project would disturb more than one acre of soil, a General Construction Stormwater Permit would be obtained prior to construction from the State Water Resources Control Board. As part of the permit, a stormwater pollution prevention plan (SWPPP) would be developed and submitted. Solyndra would contain all stormwater on site.

Permit to Operate – Bay Area Air Quality Management District

Two air permits would need to be obtained: one for the diesel generator, which would be operated monthly during routine testing and during occasional power outages, and one for the six exhaust scrubbers (three that would remove hydrochloric acid and three that would remove ammonia from the air exhaust stream) and the operation of electronic parts cleaning.

Permit to Operate – State of California

An air permit would be required from the State of California to operate an air pressure tank that is proposed as part of Fab 2.

Permit by Rule – City of Fremont Hazmat Department

A Permit by Rule would need to be obtained from the City of Fremont Hazmat Department. This permit allows for the on-site treatment of hazardous waste at the proposed Fab 2 facility.

Waste Discharge Permit – Union Sanitary District

A Waste Discharge Permit would be required for Solyndra to release wastewater to the municipal wastewater collection system.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED

The decision for DOE consideration covered by this NEPA review is whether to approve the loan guarantee for the proposed Solyndra project or not. This section provides background information on how Solyndra came to decide upon its proposed configuration of the Front End and Back End of Fab 2.

Solyndra Fab 2's Back End manufacturing activity will be housed in a leased building aggregating approximately 150,000 square feet. Back End activities are simple processes compared to Front End manufacturing, and they include PV module encapsulation and panel framing processes. To reduce overall manufacturing costs and upfront capital requirements for new construction, Solyndra is taking advantage of the fact that the Back End processes do not require the expensive special-purpose design functionality required by Front End operations, such as deionized water sources, wastewater treatment and disposal, process heating and cooling facilities, etc. Solyndra considered combining the Front End and Back End operations at the same location, but rejected this alternative because a combined Front End and Back End production facility would have required an estimated fifty contiguous acres of undeveloped land, and such a parcel size is not generally available in industrial zones in the San Francisco Bay Area. Numerous existing commercial properties are appropriate to house Back End manufacturing processes, as long as a sufficient source of electrical power is available.

Solyndra also explored alternative sites for construction of the Front End facility. Solyndra retained a global engineering and construction

consultant to assist with the evaluation of potential manufacturing sites in the U.S. Key criteria included: (a) quality of workforce; (b) availability of construction trades; (c) utility capacity and readiness; (d) site appropriateness; (e) proximity of airport for travel to/from Fremont; (f) proximity of technology supply chain; and (g) land availability. Eight states responded to a Request for Information, and ten sites were selected for comparison to sites in California. The consultant performed a net present value analysis of various state and local incentives to evaluate the value of local taxes, costs, and economic inducements to locate at each site. Additional financial considerations evaluated included: (a) the cost to develop utility and other infrastructure required for the site; (b) utility connection fees; (c) implications for freight transportation expenses; (d) land cost; and (e) utility rates. Solyndra also undertook an analysis of the intangible costs and benefits of a site located near its headquarters in Fremont versus a site located in another state. Expanding Solyndra's Fab 1 facility to include Fab 2 was determined not to be viable because there was not sufficient space for the development of Fab 2.

Solyndra's management team drew from its own extensive professional experience managing semiconductor, storage, and other fabrication facilities in disparate locations, as well as surveying executives of other large-scale semiconductor and storage manufacturing companies for inputs into the risks, benefits, and hidden costs of managing disparate locations. Key issues for sites outside of the Fremont area, where the concentration of workers with experience in high tech, thin-film manufacturing is much higher than in other parts of the country, include: (a) lost production output due to slower employee training rates, (b) lower efficiencies due to lack of training and/or access to experienced thin-film manufacturing personnel on a day-to-day basis, (c) slower site production line commissioning rates, (d) management distraction due to travel and differences in time zones, and (e) inability to staff the facility with a large number of experienced Solyndra Fab 1 employees. An additional factor in site location is Solyndra's excellent relationships with administrative personnel in the City of Fremont. These factors were combined to determine that the Fremont site was the optimal site for the Solyndra Fab 2 facility.

2.4 NO ACTION ALTERNATIVE

DOE's regulations implementing NEPA require inclusion of a no action alternative in an EA.

Without the loan guarantee, Solyndra would not construct the Fab 2 facility described under the proposed action. Solyndra would continue to produce photovoltaic panels at the Fab 1 facility in Fremont, California. DOE's ability to meet the stated purpose and need would be decreased by not guaranteeing a loan to Solyndra.

The decision for DOE consideration covered by this NEPA review is whether to approve the loan guarantee for the proposed Solyndra project or not. Solyndra's decision to select the Fremont site, described in Section 2.3, is supported by the negative declaration issued by the City of Fremont pursuant to the environmental review conducted under the California Environmental Quality Act (Appendix A). Further, there are no unresolved conflicts concerning alternative uses of available resources associated with the project site that would suggest the need for other alternatives (40 CFR 1508.9(b)). Therefore, other than no action, there is no alternative to providing a loan guarantee to Solyndra for the proposed project in Fremont, California considered in this NEPA review.

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing social, economic, and environmental conditions of the project area. This information is used in Chapter 4, Environmental Consequences, as the baseline for identifying and evaluating impacts resulting from the proposed action and the no action alternative described in Chapter 2, Proposed Action and Alternatives.

3.2 LAND USE

The subject property is within an urbanized industrial park. The lot is currently vacant, undeveloped land. Kato Road, which borders the site to the west (front), is a standard commercial road improved to 36 feet of paved width and acts as a frontage road to Interstate 880 (I-880).

The parcels immediately to the north contain warehouse facilities with numerous truck-loading docks, while the abutting parcel to the south is currently under construction as a regional newspaper printing facility. There are no buildings opposite Kato Road from the site, only an unimproved dirt shoulder with a buffer and drainage swale running alongside the 1-880 freeway. A Union Pacific rail line separates the site from smaller industrial parcels to the east. There is an Alameda County Flood Control District open engineered bank flood channel running along the northern property line. An existing driveway serving the JC Paper facility at the back of the site runs alongside this channel. The driveway will remain in its present location and continue to provide access to the JC Paper facility as well as to the service and delivery areas for the proposed development. A number of mature trees and landscaping line the existing driveway between the pavement and the flood channel; these trees and landscaped areas would not be affected by the proposed development (City of Fremont 2008d).

The topography of the site features a gradual rise of approximately 2 percent from the Kato Road property line to the rear property line. There are no structures on the site, only low brush; therefore, no demolition permits would be needed prior to commencement of grading activities. There are full frontage improvements already in place along Kato Road, including curb, gutter, sidewalk, and landscaped berm with trees (City of Fremont 2008d).

The proposed project entitlements include a zoning administrator permit to increase the Floor Area Ratio from 0.35 to 0.44 and approval of the Fab 2 facility as a large user of hazardous materials. The project also includes a preliminary grading plan.

City of Fremont General Plan

The City of Fremont General Plan (1991) guides the city's future physical development and provides a framework by which decisions on growth, public services and facilities, and safety and enhancement of the community can be made. The project site has a City of Fremont General Plan designation of Restricted Industrial (Commercial-Industrial Overlay) and is zoned as I-R – Restricted Industrial.

3.3 VISUAL RESOURCES

There are no scenic resources on or near the site. The undeveloped site, which is surrounded by industrial and commercial uses, is bound by a Union Pacific rail line to the east and a road (Kato Road) and freeway (I-880) to the west.

I-880 is adjacent to the western site frontage of the proposed Fab 2 facility and has been identified as a scenic highway by the City of Fremont and Alameda County General Plans. Recognized scenic resources in the City of Fremont General Plan include the Fremont Hills and Mission Peak, approximately one mile to the east of the site, and the San Francisco Bay, approximately one mile to the west of the site (City of Fremont 1991).

3.4 AIR QUALITY

The region of influence (ROI) for air quality varies according to the type of air pollutant being discussed. Pollutants such as carbon monoxide and directly emitted particulate matter have a localized region of effects generally restricted to the immediate vicinity of the source of emissions, while pollutants such as ozone have a broader region of effects. This section presents general air quality information, followed by regional information and a discussion of greenhouse gases.

3.4.1 Regulatory Framework

Clean Air Act

The Clean Air Act (CAA) of 1970, as amended (42 United States Code [USC] §§ 7401 et seq.), regulates emissions from stationary, mobile, and

area sources and establishes national ambient air quality standards for pollutants that can harm human health or the environment. Under the CAA, EPA is responsible for revising these standards when necessary as new air quality data and related impacts on the human environment become available.

National Ambient Air Quality Standards

National ambient air quality standards have been adopted for six criteria pollutants—ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM_{10} and $PM_{2.5}$), and airborne lead. The national ambient air quality standards may include primary or secondary standards. Primary standards set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. Averaging periods vary by criteria pollutants based on potential health and welfare effects of each pollutant. The national ambient air quality standards are enforced by the states via local air quality agencies. States may choose to adopt their own air quality standards, but state standards must be at least as stringent as federal standards. Table 3-1, National Ambient Air Quality Standards, lists the national ambient air quality standards.

Table 3-1
National Ambient Air Quality Standards

Pollutant	Averaging Times	Ambient Concentration Standard[1]	Primary (P) or Secondary (S) standard[2]
Ozone	8 hours	0.075 ppm (147 µg/m^3)	P, S
Carbon monoxide	1 hour	35 ppm (40 mg/m^3)	P
	8 hours	9 ppm (10 mg/m^3)	P
PM_{10}	24 hours	150 µg/m^3	P, S
$PM_{2.5}$	24 hours	35 µg/m^3	P, S
	Annual	15 µg/m^3	P, S
Nitrogen dioxide	Annual	0.053 ppm (100 µg/m^3)	P, S
Sulfur dioxide	3 hours	0.5 ppm (1,300 µg/m^3)	S
	24 hours	0.14 ppm (365 µg/m^3)	P
	Annual	0.03 ppm (80 µg/m^3)	P
Lead	Quarterly Average	1.5 µg/m^3	P, S

[1] ppm = parts per million; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter
[2] P = primary standard (health-based); S = secondary standard (welfare-based)
Source: 40 CFR Part 50

EPA evaluates whether the criteria air pollutant levels within a geographic area meet national ambient air quality standards. Areas that violate air quality standards are designated as nonattainment areas for the relevant pollutants. Non-attainment areas are sometimes further classified by degree (marginal, moderate, serious, severe, and extreme for ozone, and moderate and serious for carbon monoxide and PM_{10}). Areas that comply with air quality standards are designated as attainment areas for the

relevant pollutants. Areas that have been redesignated from nonattainment to attainment are considered maintenance areas. Areas of uncertain status are generally designated as unclassifiable but are treated as attainment areas for regulatory purposes.

Federal law requires states to develop plans, known as state implementation plans, describing how they would attain national ambient air quality standards. State implementation plans are approved by EPA and are federally enforceable.

Clean Air Act Conformity Guidelines

Section 176(c) of the federal CAA contains requirements that apply specifically to federal agency actions, including actions receiving federal funding. This section of the CAA requires federal agencies to ensure that their actions are consistent with the CAA and applicable state air quality management plans. Federal agencies are required to evaluate their proposed actions to ensure that they would not cause or contribute to new violations of any federal ambient air quality standards, that they would not increase the frequency or severity of any existing violations of federal ambient air quality standards, and that they would not delay the timely attainment of federal ambient air quality standards.

EPA has promulgated separate rules that establish conformity analysis procedures for transportation-related actions and for other (general) federal agency actions. The general conformity rule requires a formal conformity determination document for federally sponsored or funded actions in nonattainment or maintenance areas when the net increase in direct and indirect emissions of nonattainment or maintenance pollutants exceeds specified *de minimis* thresholds.

The relevant CAA conformity de minimis thresholds for federal actions in the San Francisco Bay Area Air Basin are 100 tons per year each of ozone precursors (volatile organic compounds and nitrogen oxides) and 100 tons per year of carbon monoxide (40 CFR Part 51.853).

State Plans and Ambient Air Quality Standards

California has adopted ambient air quality standards that are more stringent than the comparable federal standards and that address pollutants not covered by federal ambient air quality standards. California ambient air quality standards are presented in Table 3-2, California Ambient Air Quality Standards.

A state implementation plan for the San Francisco Bay Area Air Basin was completed in 1991, and a Bay Area Clean Air Plan was adopted by the Bay Area Air Quality Management District (BAAQMD) in 1997.

3.4.2 Regional Air Quality

The project site is in the San Francisco Bay Area Air Basin. Air quality in the San Francisco Bay Area Air Basin is regulated by BAAQMD for stationary source emissions and by the California Air Resources Board for mobile source emissions. BAAQMD has jurisdiction over air quality in all or portions of nine counties in the Bay Area.

Table 3-2
California Ambient Air Quality Standards

Pollutant	Averaging Times	Ambient Concentration Standard[1]
Ozone	1 hour	0.09 ppm (180 µg/m^3)
	8 hours	0.070 ppm (137 µg/m^3)
Carbon monoxide	1 hour	20 ppm (23 mg/m^3)
	8 hours	9 ppm (10 mg/m^3)
PM_{10}	24 hours	50 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3
$PM_{2.5}$	Annual Arithmetic Mean	12 µg/m^3
Nitrogen dioxide	1 hour	0.18 ppm (339 µg/m^3)
	Annual Arithmetic Mean	0.30 ppm (57 µg/m^3)
Sulfur dioxide	1 hour	0.25 ppm (655 µg/m^3)
	24 hours	0.04 ppm (105 µg/m^3)
Lead	30 days	1.5 µg/m^3
Sulfate Particles	24 hours	25 µg/m^3
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)
Vinyl Chloride	24 hours	0.01 ppm (26 µg/m^3)

[1] ppm = parts per million; mg/m^3 = milligrams per cubic meter; µg/m^3 = micrograms per cubic meter
Source: California Air Resources Board 2008a.

The San Francisco Bay Area Air Basin is designated as a marginal nonattainment area for the 8-hour federal ozone standard and an attainment or unclassified area for the remainder of the federal air quality standards. EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 ppm (75 ppb) effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010 (Bay Area Air Quality Management District 2008a). The San Francisco Bay Area Basin is a moderate maintenance area for carbon monoxide (U.S. Environmental Protection Agency 2008). The nearest BAAQMD monitoring station is located at 40733 Chapel Way in Fremont.

The San Francisco Bay Area Air Basin is designated as a nonattainment area for state ozone (both 8-hour and 1-hour), PM_{10} (both 24-hour and annual arithmetic mean), and $PM_{2.5}$ (annual arithmetic mean), and as attainment or unclassified for all other state standards.

3.4.3 Greenhouse Gases and Climate Change

Greenhouse gases are chemical compounds in the Earth's atmosphere that trap heat. Greenhouse gases allow sunlight to enter the atmosphere freely, but limit the amount of infrared radiation (heat) that bounces back into space after striking the Earth's surface. Over time, the amount of

energy sent from the sun to the Earth's surface should be about the same as the amount of energy radiated back into space, leaving the temperature of the Earth's surface roughly constant. Most studies, however, indicate that the Earth's climate has warmed over the past century and that human activity affecting the atmosphere is likely an important contributing factor. Computer-based modeling suggests that rising greenhouse gas concentrations generally produce an increase in the average temperature of the Earth, which may produce changes in sea levels, rainfall patterns, and intensity and frequency of extreme weather events. Collectively, these effects are referred to as "climate change" (National Energy Information Center 2008). The Intergovernmental Panel on Climate Change (IPCC), in its Fourth Assessment Report, stated that warming of the earth's climate system is unequivocal, and that warming is very likely due to anthropogenic greenhouse gas (GHG) concentrations (Intergovernmental Panel on Climate Change 2007).

Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide, methane, and nitrous oxide are examples of greenhouse gases that have both natural and manmade sources, while other gases such as those used for aerosols are exclusively manmade. In the United States, greenhouse gas emissions come mostly from energy use. These are driven largely by economic growth, fuel used for electricity generation, and weather patterns affecting heating and cooling needs. Energy-related carbon dioxide emissions, resulting from petroleum and natural gas, represent 82 percent of total U.S. manmade greenhouse gas emissions (National Energy Information Center 2008).

3.5 NOISE

There are no existing on-site noise sources. Nearby existing noise sources that affect the project site include traffic on I-880, passing trains on the Union Pacific rail line, heating, ventilation, and air conditioning (HVAC) systems at adjacent buildings, overhead aircraft, and wind.

The nearest sensitive receptors are residential homes, approximately 0.26 mile to the east, and two schools: Sunshine Kid's Preschool, approximately 0.26 mile to the east, and Warm Springs Elementary School, approximately 0.30 mile to the northeast.

The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978 (42 USC 4901-4918), delegates to the states the authority to regulate environmental noise. It also directs government agencies to comply with local community noise statutes and regulations, and to conduct their programs to promote an environment free of any noise that could jeopardize public health or welfare.

The City of Fremont Health and Safety Element of the General Plan has a noise sub-element that follows the guidelines adopted by the State Office of Noise Control (Section 46050.1 of the Health and Safety Code) and meets the requirements in Section 65302(f) of the California Government Code. The Health and Safety element establishes exterior noise level standards for evaluating compatibility between land uses and future noise levels in the city. The maximum acceptable noise level in residential areas is a day-night average noise level of 60 decibels. Appropriate interior noise levels in commercial, industrial, and office buildings are a function of the use of space and shall be evaluated on a case-by-case basis. Interior noise levels in offices generally should be maintained at an hourly average of 45 decibels or less (City of Fremont 1991).

3.6 GEOLOGY AND SEISMICITY

This section describes the regulatory framework related to geology and seismicity, the site topography, the regional geologic setting, the local geology, regional seismicity, and geologic hazards.

3.6.1 Regulatory Framework

Geologic resources and hazards are governed primarily by state and local jurisdictions. Seismic hazards are addressed by state and local requirements for identifying and avoiding faults when considering new development.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface fault rupture to structures for human occupancy. In accordance with this act, the state geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. The site is not located within a fault zone, so the act does not apply to the proposed action.

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The act directs the California Department of Conservation, California Geological Survey, to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. The act requires site-specific geotechnical investigations to identify potential seismic hazards and formulate mitigation measures prior to permitting most developments designed for human occupancy within the Zones of Required Investigation.

A portion of the project site is within a designated liquefaction Zone of Required Investigation (California Geological Survey 2004); therefore, a site-specific geotechnical investigation is required prior to the City of Fremont issuing any permits for construction at the site (City of Fremont 1991).

California Building Code

The 2007 California Building Code (CBC) is based on the 1997 Uniform Building Code, with the addition of more extensive structural seismic provisions. The CBC is contained in the California Code of Regulations (CCR), Title 24, or the California Building Standards Code, and is a compilation of three types of building standards from three different origins:

- building standards that have been adopted by state agencies without change from building standards contained in national model codes;
- building standards that have been adopted and adapted from the national model code standards to meet California conditions; and
- building standards, authorized by the California legislature, that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns.

Title 24, Part 2, Volume 2, Chapter 16 of the CCR contains definitions of seismic sources and the procedure used to calculate seismic forces on structures. The CBC covers grading and other geotechnical issues, building specifications, and non-building structures. The project would include these types of improvements, and the CBC would be applicable.

City of Fremont General Plan

Geologic hazards such as landslides, liquefaction, slope instability, ground shaking, fault rupture, and erosion are addressed by the City of Fremont General Plan. The Health and Safety element of the City of Fremont General Plan includes policies for avoiding geologic hazards and protecting unique geologic features. The City of Fremont adopts the CBC and includes amendments requiring geotechnical investigations for landslide and slope instability areas and evaluates surface response, liquefaction, slope stability, erosion, and drainage (City of Fremont 1991).

3.6.2 Site Topography

The topography of the site is relatively flat, with an upward slope of approximately 2 percent from west to east and an elevation range of 19 feet above mean sea level to 46 feet above mean sea level.

3.6.3 Regional Geologic Setting

The project site is in the Coast Ranges geomorphic province that extends from Santa Barbara County to the Oregon border. The major geographic features in the San Francisco-East Bay area include: the Diablo Range,

Santa Cruz Mountains, San Francisco Peninsula, and San Francisco Bay. The region consists of northwest-trending mountain ranges, broad basins, and elongated valleys generally parallel to the San Andreas Fault. In the Coast Ranges, older, consolidated rocks are exposed in the mountains but are buried beneath younger, unconsolidated alluvial fan and fluvial sediments in the valleys and lowlands.

3.6.4 Local Geology

The project site is at the eastern margin of a broad alluvial plain that extends from the East Bay Hills to San Francisco Bay. The alluvial plain under and around the project site is composed of alluvium deposited by local creeks. The site was historically tidal wetlands and was reclaimed in the late 1800s for agricultural uses. Soils at the project site are Clear Lake Clay, which is defined as having slopes of 0 to 2 percent, poorly drained (Natural Resources Conservation Service 2008). No geotechnical studies are known to have been conducted at the project site.

3.6.5 Regional Seismicity

The project site is within Seismic Zone 4, as defined by the CBC. The San Francisco Bay Area and surrounding areas are characterized by numerous geologically young faults. The Hayward and Calaveras faults are the active faults of the San Andreas Fault system that are predominantly responsible for seismic activity near the project site.

3.6.6 Geologic Hazards

Ground shaking and liquefaction are the two notable geologic hazards present at the project site. The area is generally flat, so there is no risk of slope failure or landslides. Also, the site does not overlay any faults, so there is no risk of fault rupture.

Ground Shaking

The project site, like all of the San Francisco Bay area, is in a seismically active region near the boundary of two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast. The site is approximately one mile west of the Alquist-Priolo Earthquake Fault Zone for the Hayward Fault. The Hayward Fault is part of the San Andreas Fault system. A 2003 study by the U.S. Geological Survey estimated a 62 percent probability of a magnitude 6.7 or greater earthquake in the next 30 years for the San Francisco Bay Area.

Liquefaction

The Seismic Hazard Map for Milpitas Quadrangle (California Geological Survey 2004) reveals that the western portion of the project site is within a state-designated liquefaction Zone of Required Investigation. The zone includes the portion of the project site fronting Kato Road and extends approximately 50 feet into the project site at the north end, and approximately 150 feet into the project site at the south end.

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquakes, when there is induced, strong ground shaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include vertical settlement from densification, lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects.

On-site geotechnical studies will reveal greater details about the susceptibility of the site's soils to liquefaction.

3.7 WATER RESOURCES

The nearest surface water body is an Alameda County flood control channel directly adjacent to the northern edge of the project site. The channel runs in the east-west direction, with water flowing toward San Francisco Bay to the west.

No groundwater wells are reported for the project area (California Department of Water Resources 2008); however, soil data for the site indicates that groundwater can be expected at depths of 36 to 60 inches below the surface (Natural Resources Conservation Service 2008).

The Fremont area receives an average of 14.38 inches of precipitation per year (Western Regional Climate Center 2008).

3.7.1 Regulatory Framework

Applicable Federal Plans, Policies, and Regulations

The Clean Water Act (CWA) of 1972, as amended (33 USC §1251 et seq.), regulates surface water quality in Waters of the United States. The CWA gives EPA the authority to set standards for discharge of point source pollutants, as well as set water quality standards for all contaminants in surface waters. EPA publishes surface water quality standards and toxic pollutant criteria at 40 CFR Part 131.

The CWA mandates water quality-based control measures. Water quality standards define the goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions to protect waterbodies from pollutants (U.S. Environmental Protection Agency 2008b). Water quality standards are set by states, territories, and authorized tribes, and under Section 303(d) of the CWA, states, territories, and tribes are required to develop lists of impaired waters that do not meet water quality standards and establish total maximum daily loads (TMDL) for specific pollutants. TMDLs represent the maximum amount of a pollutant that a waterbody can receive from all contributing point and nonpoint sources and still meet water quality standards. The

calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the state has designated and must account for seasonal variations in water quality to gain approval by EPA.

State Water Quality Standards

The State Water Resources Control Board is responsible for the regulation of activities and factors that may affect the quality of the waters of the state (Water Code §§ 13000, 13001). The California Toxics Rule outlines specific water quality objectives for inland surface waters and enclosed bays and estuaries (40 CFR 131.38).

State and Regional Plans, Policies, and Regulations

The Water Quality Control Plan for the San Francisco Bay Basin is the San Francisco Bay Regional Water Quality Control Board's water control planning document (San Francisco Bay Regional Water Quality Control Board 2007). The Alameda County Public Works Agency, Clean Water Division is responsible for administering the Alameda County Flood Control and Water Conservation District Clean Water Program (Alameda County Flood Control and Water Conservation District 2008).

3.7.2 Floodplains

Floodplains are lowlands and relatively flat areas adjoining inland and coastal waters, including flood-prone areas of offshore islands that are subject to a one-percent or greater chance of flooding in any given year (41 CFR 46968). The 100-year floodplain may be present in low-lying regions, typically near rivers or drainages, or in coastal areas that are not well protected from sea swells.

Floodplains at the project site are shown in Figure 3-1. Small portions of the front edge of the site (along Kato Road) are within a Zone AH 100-year flood zone. Areas designated as "Zone AH" are areas of 100-year shallow flooding where depths are between 1 and 3 feet. The average depth of inundation within this flood zone is 19 feet above mean sea level. No flood hazard factors are determined for AH zones. The northwestern half of the site is within a Zone B flood zone. Zone B flood zones are between the limits of the 100-year flood and the 500-year flood (U.S. Federal Emergency Management Agency 2008).

3.8 BIOLOGICAL RESOURCES

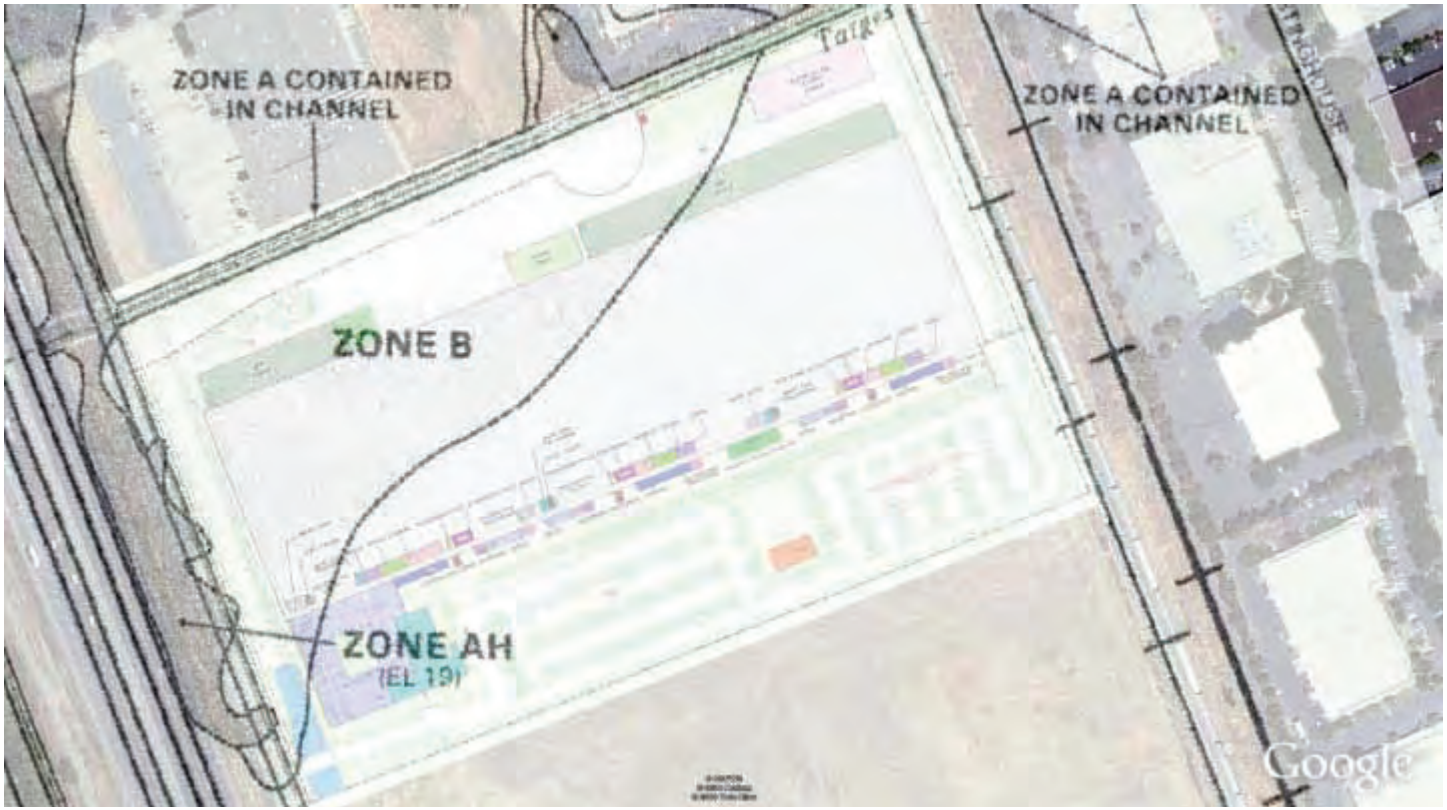
Biological resources, as described in this section, include native or naturalized plants and animals and their habitats. Protected and sensitive biological resources include specific habitats and the plant and animal species listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG) or are otherwise protected under federal or state law.

3.8.1 Applicable Federal Plans, Policies, and Regulations

Section 404 of the Clean Water Act of 1972, as amended, regulates development in wetlands and surface water bodies and requires agencies to obtain a permit from the U.S. Army Corps of Engineers to dredge or fill in U.S. waters. Executive Order 11990, Protection of Wetlands, directs federal agencies to avoid to the extent possible adverse impacts associated with the destruction or modification of wetlands. Executive Order 11988, Floodplain Management and Protection, directs federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

The principal statutes pertaining to the protection of plants and animals are the federal Endangered Species Act (ESA), as amended, which requires protection of federally listed threatened and endangered species and their habitats. The ESA is administered by the USFWS and the National Oceanic and Atmospheric Administration (NOAA) Fisheries and establishes protection and conservation of threatened and endangered species and the ecosystems upon which they depend. The California ESA is administered by the CDFG and protects plant and animal species designated by the state Fish and Game Commission as either threatened or endangered in the state of California.

The Migratory Bird Treaty Act of 1918 is the domestic law that affirms, or implements, the United States' commitment to four international conventions (with Canada, Japan, Mexico, and Russia) for the protection of a shared migratory bird resource. Each of the conventions protect selected species of birds that are common to both countries (i.e., species occur in both countries at some point during their annual life cycle). The act protects all migratory birds and their parts (including eggs, nests, and feathers).



SOURCE: Solyndra 2008, FEMA 2008, Google 2008

Zone AH—Areas of 100-year shallow flooding where depths are between 1 and 3 feet; average depth of inundation are shown, but no flood hazard factors are determined.

Zone B—Zone B—Areas between limits of the 100-year flood and 500-year flood

Floodplains at the Proposed Solyndra Facility

47700 Kato Road
Fremont, California

Figure 3-1

3.8.2 Applicable California Plans, Policies, and Regulations

State of California Endangered Species Act

The State of California ESA ensures legal protection for plants and animals listed as rare or endangered. The state also lists "Species of Special Concern" based on limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. Under the law, the CDFG is empowered to review projects for their potential to impact state-listed species and Species of Special Concern, and their habitats. The City of Fremont sent the MND to CDFG as part of the CEQA process and did not receive any comments.

California Fish and Game Code Sections 1600-1603

This statute regulates activities that would "*substantially divert or obstruct the natural flow of, or substantially change the bed, channel, or bank of, or use material from the streambed of a natural watercourse*" that supports fish or wildlife resources. A stream is defined as a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. A Streambed Alteration Agreement must be obtained for any proposed project that would result in an adverse impact on a river, stream, or lake. If fish or wildlife would be substantially adversely affected, an agreement to implement mitigation measures identified by the CDFG would be required.

California Fish and Game Code Section 3503.5

Birds of prey are protected in California under the Fish and Game Code Section 3503.5, which states that it is "*unlawful to take, possess, or destroy any birds in the order 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*." Construction disturbance during the breeding season that results in the incidental loss of fertile eggs or nestlings, or otherwise leads to nest abandonment, is considered a take. Disturbance that causes nest abandonment or loss of reproductive effort is also considered a take by the CDFG.

3.8.3 Ecoregions and Vegetation

Ecoregions are large areas of similar climate where ecosystems occur in predictable patterns. There are various classification levels. Sections are smaller ecoregion units defined by vegetation and soil similarities. The Fremont area is within the Central California Coast ecoregion section. Dominant vegetation in this region includes a mixture of western hardwoods, chaparral-mountain shrub, and annual grasslands (McNab et al. 2007).

The project area is found in the East Bay terraces and alluvium subsection, which covers the entire alluvial plain between the East Bay Hills and the San Francisco Bay. It extends from San Pablo Bay southeast to the Santa Clara Valley. The Hayward fault runs along the northeast edge of the subsection. The climate is hot and fairly humid, as there is a strong marine influence from the nearby San Francisco Bay. The predominant natural plant communities are California oatgrass and needlegrass grasslands, which can be found at the project site, along with several invasive plant species (U.S. Forest Service 2008).

The only trees currently on the site are a row of street trees lining the driveway leading to the JC Paper facility at the rear of the site and a row of approximately 20 to 25 trees along the front property line adjacent to Kato Road (City of Fremont 2008d).

3.8.4 Protected and Sensitive Habitats

Sensitive habitats include wetlands and riparian habitat. The closest wetlands occur approximately 0.70 mile west of the project site and across I-880 (U.S. Fish and Wildlife Service 2008a). Riparian habitat is limited to the area directly adjacent to the Alameda County Flood Control channel.

The project would not conflict with any Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plans.

3.8.5 Fish and Wildlife

Fish and wildlife resources include indigenous and migratory animal species. These resources include wildlife individuals and populations and their relationship to habitat, including wetland and riparian ecosystems. The disturbed nature of the project site does not provide what would be considered high-quality wildlife habitat, and limited wildlife species are expected to occur. A site visit and assessment of potential biological resources was conducted in the winter of 2006-2007, with a memorandum dated February 27, 2007 reporting the conclusions (City of Fremont 2007). This study was done as part of a proposed lot subdivision at the site and construction of a printing facility. The study area included the current project area.

The area that would be affected by the project is in a low-lying coastal area on developed urban lands. Species that may occur include transient avian species, although breeding or other critical habitats do not occur in the project area. Rare plant species are not expected to occur in the project area. The site is not known to serve as a migratory wildlife corridor or as a wildlife nursery site for native resident or migratory fish or wildlife species.

Threatened and Endangered Species and Special Status Species

Of principal concern are direct or indirect effects upon state and federally protected species or their prime habitats. State and federally listed species are typically found in diverse or unique natural environments. Due to the disturbed conditions at the project site and the developed nature of the adjacent properties, the project site is not likely to support listed species. No known special status species of plant or animal or evidence of their presence was detected during the biological survey, and no existing records indicate the presence of such species at the site (California Natural Diversity Database 2008).

The project site was part of a recent development application in which a single large parcel was subdivided into three smaller lots and a 333,400 square foot newspaper printing facility was approved to be developed on the land immediately to the south of the site (Nadev Development, City of Fremont Application No. PLN2007-00356, also referred to as the Transcontinental Newspaper printing facility). A biological survey was conducted on the property as part of the environmental review for the Nadev Development on February 27, 2007. Since the time of the initial survey, the 30-acre project site conditions have not been altered. The initial survey did not find any special status plant or animal species or Federally protected wetlands on the property. Additionally, the follow up pre-construction surveys for the Nadev facility in the Spring of 2008 did not identify the presence of threatened or endangered species (City of Fremont 2008d).

A list of protected flora and fauna recorded from past surveys or projects within the surrounding area is found below (Table 3-3, Threatened and Endangered Species with Potential to Occur in the Project Area). Lists are periodically updated by the California Department of Fish and Game as part of the Natural Diversity Database, which records and maps occurrence of special status species (California Natural Diversity Database 2008). Plants and animals with record of occurrence nearby are included below (California Natural Diversity Database 2008, California Native Plant Society 2008).

Robust Spineflower

The robust spineflower is restricted to sandy soils along the coast and near-coastal areas in Santa Cruz County, California from Santa Cruz south to Sunset State Beach. It is currently known to occur at four sites (U.S. Environmental Protection Agency 2000). Populations of the plant are believed to be extirpated from Alameda and Santa Clara Counties (California Natural Diversity Database 2008), and the plant is not expected to occur in the project area.

Contra Costa Goldfields

Contra Costa (*Lasthenia conjugens*) goldfields is a showy, spring annual herb in the aster family (*Asteraceae*). This species has been extirpated from Santa Barbara and Santa Clara Counties by agricultural land conversion, urbanization, and creek channelizing. Nearly all of the remaining populations are imminently threatened by urban development or agricultural land conversion (U.S. Fish and Wildlife Service 2008g). The species is not known to exist in the project area and has not been recorded nearby.

Table 3-3
Threatened and Endangered and Special Status Species with Potential to Occur in the Project Area

Common Name	Scientific Name	Likelihood of Occurrence	Federal Status	State Status
Plants				
Robust spineflower	*Chorizanthe robusta var. robusta*	None	Endangered	--
Contra Costa goldfields	*Lasthenia conjugens*	None	Endangered	--
California seablite	*Suaeda californica*	None	Endangered	--
Invertebrates				
Vernal pool tadpole shrimp	*Lepidurus packardi*	None	Endangered	--
Reptiles and Amphibians				
California tiger salamander	*Ambystoma californiense*	None	Threatened	--
California red-legged frog	*Rana aurora draytonii*	None	Threatened	--
Alameda whipsnake	*Masticophis lateralis euryxanthus*	None	Threatened	--
Birds				
California clapper rail	*Rallus longirostris obsoletus*	Possible transit	Endangered	Endangered
Western snowy plover	*Chradrius alexandrinus nivosus*	Possible transit	Threatened	--
Western burrowing owl	*Athene cunicularia*	High	Concern	Concern
Invertebrates				
Salt-marsh harvest mouse	*Reithrodontomys raviventris*	None	Endangered	Endangered

Source: California Natural Diversity Database 2008; California Native Plant Society 2008, U.S. Fish and Wildlife Service 2008i
None = No habitat present.

California Seablite

California seablite (*Suaeda californica*) is a succulent-leaved perennial plant in the goosefoot (*Chenopodiaceae*) family. The California seablite was protected as an endangered species under the federal ESA in 1994. Although its colonial nature makes precise population counts difficult, it was estimated that there were only 500 individual plants remaining when the species was protected (Golden Gate National Recreation Area 2008). The plant is not known or expected to occur in the project area.

Vernal pool tadpole shrimp

The vernal pool tadpole shrimp (*Lepidurus packardi*) is a small crustacean in the Triopsidae family that inhabits vernal pools containing clear to highly turbid water. The vernal pool tadpole shrimp has a patchy distribution across the Central Valley of California, from Shasta County southward to northwestern Tulare County, with isolated occurrences in Alameda and Contra Costa Counties. Critical habitat for the tadpole shrimp is designated and exists approximately two miles northeast from the project site in the Don Edwards National Wildlife Refuge (U.S. Fish and Wildlife Service 2008k).

California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*) is restricted to grasslands and low (typically below 2,000 feet [610 meters]) foothill regions where lowland aquatic sites are available for breeding. They require refuges provided by ground squirrels and other burrowing mammals in which to enter a dormant state called *estivation* during the dry months (U.S. Fish and Wildlife Service 2008b). Suitable habitat for California tiger salamander does not exist at the proposed project site, nor can it be found nearby in the developed areas surrounding the proposed project area.

California Red-Legged Frog

The California red-legged frog (*Rana aurora draytonii*) occupies a fairly distinct habitat, combining both specific aquatic and riparian components. Adults need dense, shrubby, or emergent riparian vegetation closely associated with deep (greater than 2 1/3 feet deep) still or slow moving water (U.S. Fish and Wildlife Service 2008c). Suitable habitat for California red-legged frog is not found at or near the proposed site, and the frog is not expected to occur in this area.

Alameda Whipsnake

The Alameda whipsnake (*Masticophis lateralis euryxanthus*) is a slender, fast-moving, diurnally active (day-time) snake with a slender neck, broad head and large eyes. Alameda whipsnakes are typically found in chaparral, northern coastal sage scrub and coastal sage. Recent telemetry data indicate that, although home ranges of Alameda whipsnakes are centered on shrub communities, they venture up to 500 feet into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland (U.S. Fish and Wildlife Service 2008j). The closest suitable habitat for the snake is found approximately two miles from the site, on the eastern side of Interstate 680 in the Mission Peak foothills.

California Clapper Rail

California clapper rails (*Rallus longirostris obsoletus*) are now restricted almost entirely to the marshes of San Francisco estuary, where the only

known breeding populations occur. In southern San Francisco Bay, there are populations in all of the larger tidal marshes (U.S. Fish and Wildlife Service 2008d). Suitable habitat for the California clapper rail can be found approximately one mile west of the project, across I-880 in the marshes of the San Francisco Bay. No suitable habitat for nesting or foraging exists at the project site, and any occurrence of the bird would be a result of infrequent migrations through the area.

Western Burrowing Owl

The Western burrowing owl (*Athene cunicularia*) is a grassland specialist distributed throughout North America, primarily in open areas with short vegetation and bare ground in desert, grassland, and shrub habitats. Burrowing owls do not actually create burrows; rather, they are dependent on fossorial mammals (primarily ground squirrels and prairie dogs), whose burrows they utilize for nesting and roosting. Primary threats to burrowing owls are land conversion and urbanization, as well as the elimination of burrowing rodents through control programs. Burrowing owls are considered a species of concern under the federal ESA and are also a California state species of concern (Klute et al. 2003).

The survey conducted for the City of Fremont determined that the project site contained suitable habitat for burrowing owls (City of Fremont 2008d).

Western Snowy Plover

The Western snowy plover (*Chradrius alexandrinus nivosus)* is a small shorebird, about six inches long. The Pacific coast population of the snowy plover is defined as those individuals that nest adjacent to tidal waters of the Pacific Ocean and includes all nesting birds on the mainland coast, peninsulas, offshore islands, adjacent bays, estuaries, and coastal rivers. The breeding season in the United States extends from March 1 through September 30, although courtship activities have been observed during February. The population breeds above the high-tide line on coastal beaches, sand spits, dune-backed beaches, sparsely vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitat includes bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars (U.S. Fish and Wildlife Service 2008e). Habitat for the plover does not exist at the project site. Only marginal habitat exists in the tidal marshes west of the project site, and the high level of human disturbance near those areas makes them generally unsuitable for breeding or nesting. The plover is not expected to occur, except as a possible infrequent migratory transient.

Salt Marsh Harvest Mouse

The salt marsh harvest mouse (*Reithrodontomys raviventris*) is a small native rodent in the *Cricetidae* family, which includes field mice, lemmings, muskrats, hamsters, and gerbils. Salt marsh harvest mice are

critically dependent on dense cover, and their preferred habitat is pickleweed (*Salicornia virginica*). Of the 193,800 acres of tidal marsh that bordered San Francisco Bay in 1850, about 30,100 acres remain, representing an 84-percent reduction. An estimated 600 acres of former salt marsh along Coyote Creek, Alviso Slough, and Guadalupe Slough have been converted to fresh- and brackish-water vegetation due to freshwater discharge from South Bay wastewater facilities and likely no longer support salt marsh harvest mice (U.S. Fish and Wildlife Service 2008f). There is no suitable habitat for the mouse in the project area, and none are expected in the marshes nearby.

Critical Habitat

Alameda County has 17 species listed as threatened or endangered under the ESA; however, the only species with critical habitat near the project area is the vernal pool tadpole shrimp. Critical habitat for the tadpole shrimp is approximately two miles from the site in the Don Edwards National Wildlife Refuge (U.S. Fish and Wildlife Service 2008l).

Migratory Birds

Migratory birds in North America are an international resource, with numerous species breeding throughout the United States and Canada. In the fall these birds migrate south to winter in the southern parts of the U.S., Mexico, and Central and South America. Because of the migratory nature of these species and their interstate and international movements, ultimate management authority lies with the federal government (U.S. Fish and Wildlife Service 2008h).

The project area is located in the Pacific flyway. Migratory birds include waterfowl, shorebirds, and other species that utilize marine, coastal, riparian, and forest habitat during migration. The project area may be utilized by migratory birds foraging or migrating through the area. The project site is not prime habitat for migratory birds and does not provide important sources of food, cover, breeding, or nesting habitat.

3.9 CULTURAL RESOURCES

The National Historic Preservation Act of 1966 (NHPA) is the primary federal law protecting cultural, historic, and Native American resources. Section 106 of the NHPA requires DOE to take into account the effects of its undertakings on historic properties, and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment (Advisory Council on Historic Preservation 2008).

The Section 106 process is initiated by first determining whether the proposed action is a type of activity that could affect historic properties. Historic properties are properties that are included on the National Register of Historic Places or that meet the criteria for listing on the National Register (Advisory Council on Historic Preservation 2008). No

known historical or archaeological resources have been identified on the project site or in the general area of the project site. City of Fremont staff reviewed local inventories and found no known cultural resources or areas likely to contain such resources on or adjacent to the subject property (City of Fremont 2008d).

A records search was performed by the Northwest Information Center (NWIC) (NWIC file no. 08-0835, January 21, 2009) and is included in Appendix A. The results of the records search showed that the project site had been previously surveyed (survey no. S-021136) in 1996 by Busby and Guedon of Basin Research Associates. The survey covered the entire site, extending south to the existing building beyond the project site's southern boundary, north to the flood control channel, and from Kato Road to the west to the railroad to the east. Nothing was found except modern refuse, concrete boulders, and evidence of previous grade and fill. There is one recorded adjacent resource, the railroad itself, which is outside of the direct Area of Potential Affect (APE) but within the indirect APE. The results of the records search indicated that the portion of the railroad line closest to the project site was evaluated as ineligible.

No historic properties were listed on the National Register of Historic Places or the California Register of Historic Places, and none of the historic maps received show any buildings or structures as having existed on or near the project site. The Native American Heritage Commission (NAHC) stated in a letter on January 27, 2009, that a record search of the sacred land file failed to indicate the presence of Native American cultural resources in the project area. Appendix A contains SHPO, NWIC, and NAHC correspondence.

3.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.10.1 Socioeconomics

The socioeconomic resources that influence the quality of the human environment include demographic information on population and housing and economic figures such as employment, income, and earnings. Population is the number of residents in the area and the recent change in population growth. Housing includes numbers of units, ownership, and vacancy rate. Employment data include labor sectors, labor force, and statistics on unemployment. Income information is provided as per capita income. The present day socioeconomic setting is described using the most recently available U.S. Census Bureau data from 2006, unless otherwise noted.

The region of influence (ROI) for the proposed action is Alameda County, California and the City of Fremont. Selected economic indicators for the ROI and comparative data for the state are presented in Table 3-4, Selected Socioeconomic Indicators for the Region of Influence and State of California.

The population in Alameda County totaled 1,457,426 in 2006. The population is relatively stable, with less than one-percent growth since 2000. In the City of Fremont, the 2006 population was 207,356, an increase of 1.9 percent from 2000.

There are 559,704 housing units in the ROI, with a 7.6-percent vacancy rate (about 4 percent less than the national average). More than half of the housing units are owner occupied (57.4 percent), and less than half are renter occupied (42.6 percent). The median value of a home in the ROI is $646,800, which is almost 3.5 times greater than the U.S. average of $185,200.

The average per capita income in the ROI is $30,632. The primary employment sectors include health care and social services, professional, scientific, and technical services, retail trade, and manufacturing. Unemployment in the ROI averages 7.2 percent. The existing Solyndra plant and headquarters employ approximately 590 people.

The proposed project site is in the City of Fremont, near the existing Solyndra facilities. As such, demographics (race and ethnicity) and income and poverty level data for the specific census tract for the Fab 2 facility and for the City of Fremont are included in Section 3.10.2, Environmental Justice.

Table 3-4
Selected Socioeconomic Indicators for the Region of Influence and State of California (2006)

Geographic Area	Population	Labor Force	Housing Units	Housing Vacancy Rate (percent)	Median Home Price
City of Fremont	207,356	109,652	70,330	3.8	$ 669,500
Alameda County	1,457,426	760,138	559,704	7.6	$ 646,800
California	36,457,549	18,064,498	13,174,781	7.8	$ 535,700

Source: U.S. Census Bureau 2006

3.10.2 Environmental Justice

In February 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations. This order requires that "*each federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities, on minority populations and low-income populations*" (Executive Order 12898, 59 Federal Register 7629 [Section 1-201]).

CEQ has issued guidance to federal agencies to assist them with their NEPA procedures so that environmental justice concerns are effectively identified and addressed. DOE guidance recommends that DOE consider pathways or uses of resources that are unique to a minority or low-income community before determining that there are no disproportionately high and adverse impacts on the minority or low-income population (U.S. Department of Energy 2004).

Demographics

Racial and ethnic data for the geographic areas and comparative data for the state are presented in Table 3-5, Total Percentage of Population by Race/Ethnicity. The proposed action would be located within census tract 4415.03. Adjacent census tracts, including 6618, 4443, 5046.02, and others, have comparable levels of ethnic minorities to census tract 4415.03, described in Table 3-5, below.

The Asian and Pacific Islander population forms the dominant ethnic group in the census tract (69 percent) and the City of Fremont (46.6 percent). Whites comprise 21.8 percent and 38.3 percent of the population in the census tract and city, respectively. In Alameda County, whites comprise 45.8 percent, Asians and Pacific islanders comprise 25.4 percent, and African Americans comprise 13 percent.

Table 3-5
Total Percentage of Population by Race/Ethnicity

Geographic Area	White	Black, African American	Native American, Alaskan, Aleut	Asian, Pacific Islander	Some Other Race	Latino, Hispanic, Any Race
Census Tract 4415.03*	21.8	2.7	0.1	69.0	2	5
City of Fremont	38.3	4.2	0.9	46.6	6.1	14.3
Alameda County	45.8	13.0	0.6	25.4	11.7	21.4
California	59.8	6.2	0.4	13	17.3	35.9

Source: U.S. Census Bureau 2000, 2006
*2000 data. No 2006 data available for census tract 4415.03.

Income and Poverty Level

Income statistics for geographic areas within the ROI and comparative data for the state are presented in Table 3-6, Income and Poverty Level.

No low-income populations have been identified in the communities closest to the project site. Median household income for the census tract ($90,359) and the City of Fremont ($88,335) are higher than the county ($64,424) and state ($56,645). Median income levels are nearly twice the national average of $48,451. Per capita income levels for the census tract and city are also well above those of the county and state. Unemployment

rates within the census tract (3.1 percent in 2000) and city (4.3 percent) are below county (13.1 percent) and state (13.1 percent) levels.

Table 3-6
Income and Poverty Level

Geographic Area	Median Household Income (2006-inflation adjusted dollars, exception noted)	Per Capita Income (2006-inflation adjusted dollars, exception noted)	Percentage of Individuals Living in Poverty (2006)	Percentage of Individuals Living in Poverty (2000)
Census Tract 4415.03*	90,359	35,664	X	3.1
City of Fremont	88,335	34,401	4.3	5.4
Alameda County	64,424	30,632	11.2	11.0
California	56,645	26,974	13.1	14.2

Source: U.S. Census Bureau 2000, 2006
*2000 data. No 2006 data available.

The percentage of the population in poverty in the census tract (3.1 percent in 2000) and city (4.3 percent) remain below that of the county (11.2 percent) and state levels (13.1 percent).

Protection of Children

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks (Executive Order 13045, 62 Federal Register 19885), states that each federal agency shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. Environmental health risks and safety risks mean risks to health or to safety that are attributable to products or substances that children are likely to come into contact with or to ingest.

In census tract 4415.03 and the City of Fremont, 27.0 percent of the population is younger than 18. This percent is similar to county levels (24.4), state levels (26.1 percent), and national levels (24.6 percent). The closest public schools to the proposed Fab 2 facility are Sunshine Kid's Preschool, approximately 0.26 mile to the east, and Warm Springs Elementary School, approximately 0.30 mile to the northeast.

3.11 PUBLIC HEALTH AND SAFETY

This section describes concerns related to the health and safety of the public, of construction workers during construction of the Fab 2 facility, and of workers at the both the Fab 2 and Back End facilities, once completed, and the associated regulatory framework.

Construction sites are high-risk environments involving many opportunities for falls, trips, impacts, exposure to hazardous materials,

and other injuries. The disturbance of contaminated soils introduces an additional risk of hazardous material exposure, which could lead to various medical conditions depending upon the contaminant, the level of exposure, and the person being exposed. These medical conditions include, but are not limited to, headaches, nausea, respiratory illness, skin reactions, and increased risk of cancer. A search of the U.S. Environmental Protection Agency's EnviroMapper website indicates that there is no record of contamination at the project site (EnviroMapper 2008).

Construction sites can also pose a safety hazard for members of the general public who access the site unauthorized. The sites often involve open holes in the ground, into which an individual can fall, and structures in various stages of completion that can be a falling hazard when used for climbing. Workers of the completed Solyndra facility would be working with hazardous materials on a daily basis that, if contacted, could pose health risks. All workers with potential for exposure to hazardous materials are trained in proper handling procedures and are outfitted with personal protective equipment, as necessary. Additionally, engineering controls are in place to prevent accidental exposure. Safety risks related to seismicity are discussed above under Section 3.6, Geology and Seismicity.

Occupational health and safety rights for both construction workers and workers at the completed Solyndra facility are protected through the federal Occupational Safety and Health Act (29 USC 651 et seq.). Under this act, Congress created the Occupational Safety and Health Administration (OSHA), an agency of the U.S. Department of Labor. OSHA's mission is to assure 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. States may have additional laws and regulations that build on the Occupational Safety and Health Act.

3.12 TRANSPORTATION

This section presents existing transportation routes and traffic conditions on these roadways and the intersections around the proposed project site.

3.12.1 Roadway Network

Kato Road provides primary access to the project site. Kato Road is accessed in the project area from I-880 via Mission Boulevard, and from I-680 via Scott Creek Road. Local Fremont traffic may also access Kato Road from Warm Springs Boulevard (to the south) or Warren Avenue (to the north). The key segments of the roadway system serving the project area are discussed below.

Mission Boulevard (State Route 262)

Mission Boulevard (State Route 262) is an arterial route that connects I-880 on the south and I-238 and I-580 on the north. The portion of Mission Boulevard closest to the project area is a four-lane arterial road with a median. The portion of Mission Boulevard from I-880 to I-680 is a Congestion Management Program (CMP) route, established by the Alameda Congestion Management Agency (Alameda County Congestion Management Agency 2007), with a signalized intersection at Warm Springs Boulevard.

Interstate Highway 880 (I-880)

I-880 is also known as the Nimitz Freeway in the project area and extends south to San Jose and north to Oakland. I-880 culminates in Oakland to the north at the Maze interchange (the junction of Interstates 80 and 580), and in San Jose to the south at the I-280/California 17 interchange. The Nimitz Freeway generally follows the eastern shore of the San Francisco Bay and is heavily traveled. The portion of I-880 closest to the project area has four lanes in both the northbound and southbound directions, with a 70-foot median. The portion of I-880 from Dixon Landing Road (to the south of the project area) to Alvarado-Niles Road (to the north of the project area) is a CMP route (Alameda County Congestion Management Agency 2007).

Interstate Highway 680 (I-680)

I-680 connects Fremont to the Livermore/Amador Valley, Contra Costa County, the Central Valley, and Sacramento. It has three lanes in the northbound direction and four lanes in the southbound direction, with a 70-foot median. This freeway does not have recurrent congestion problems at this time. I-680 is a CMP route from Mission Boulevard south to Scott Creek Road (Alameda County Congestion Management Agency 2007).

Kato Road

The project site is accessed by Kato Road, which is a standard commercial road that, in the area of the project site, is improved to 36 feet of paved width and acts as a frontage road to I-880. Kato Road extends from Grimmer Boulevard (to the north) to Warm Springs Boulevard (to the southeast), running adjacent to the east side of I-880 for much of its course. Kato Road turns into Scott Creek Road east of its intersection with Warm Springs Boulevard. Kato Road is one lane in each direction but expands to two lanes in each direction to the south when the road turns to the east and heads away from I-880 and toward Warm Springs Boulevard.

Warm Springs Boulevard

Warm Springs Boulevard in the project area has two lanes in both northbound and southbound directions, with a 20-foot median that is

eliminated or reduced in places where left-turn lanes have been installed. The intersection of Warm Springs Boulevard with Kato Road is signalized.

Warren Avenue

Warren Avenue extends from the intersection of Mission Boulevard and I-880 to the west, to past I-680 where it turns into Paseo Padre Parkway to the east. Warren Avenue has two lanes in both eastbound and westbound directions in the section near the project site.

3.12.2 Existing Traffic Conditions

Existing traffic conditions are described in Section 4.12, Transportation.

3.12.3 Parking Supply and Demand

The site is currently undeveloped and has no parking facilities and no need for parking facilities.

3.12.4 Bikeways and Pedestrian Facilities

Bikeways are typically classified as Class I, Class II, or Class III facilities. Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists and pedestrians, with minimal cross flow by motorized vehicles. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share streets or sidewalks with vehicles or pedestrians.

Bikeways in the project area include the following:

- Kato Road, which is designated as a shared roadway (Class III) from Warren Avenue to Warm Springs Boulevard;
- Warm Springs Boulevard, which is designated as a striped bike lane (Class II) from Warren Avenue to the north to past Scott Creek Road/Kato Road to the south; and
- Warren Avenue, which is designated as a striped bike lane (Class II) from Kato Road to the west to beyond I-680 to the east.

3.12.5 Transit

Public transit in the project area is administered by the Santa Clara Valley Transportation Authority and AC Transit. Regional rail transit is provided by Bay Area Rapid Transit (BART). The nearest BART station is the Fremont BART station, located approximately 10 miles (driving distance) north of the project site; however, construction of the Warm Springs BART station is underway, and service is expected to begin in 2008. The Warm Springs BART Station will be located at Osgood Road and Grimmer Boulevard, which would be a driving distance of 2.3 miles from the project site.

Local transit is provided along Kato Road by AC Transit Route 215, which connects the project site to the Fremont BART station via Warm Springs Boulevard, Osgood Road, Driscoll Road, and Mission Boulevard.

During the weekdays, Bus 215 runs hourly from BART from 6:21 AM to 7:21 PM and takes 35 minutes to complete the journey. During the weekdays in the opposite direction, from the project site to the BART station, Bus 215 runs from 7:35 AM through 6:35 PM, with a travel time of approximately 40 minutes. The project area is not served by Bus 215 on the weekends.

The next closest AC Transit bus is Route 217, which connects the Fremont BART Station to the Great Mall, passing by the intersection of Mission Boulevard and Warm Springs Boulevard. During the weekdays, this bus leaves from the BART station every 30 minutes from 5:42 AM to 9:12 PM and takes 31 minutes to complete the journey. The bus operates in approximately the same hours in the reverse direction. On weekends, the bus runs once per hour from approximately 7:00 AM to 7:00 PM.

3.12.6 Regulatory Framework

The following local jurisdictions were involved in the review of the traffic impact analysis (Hexagon Transportation Consultants, Inc. 2008):

- The State of California Department of Transportation (Caltrans), which reviewed traffic impacts on I-880 and I-680 mainlines and ramps and on Mission Boulevard (State Route 262); and
- The City of Fremont, which reviewed transportation impacts along the major arterial roads, such as Mission Boulevard, Warm Springs Boulevard, Warren Avenue, and Scott Creek Road/Kato Road. The City of Fremont accepted Level of Service threshold is "D."

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

The following sections describe the potential environmental effects that could result from implementing the no action alternative and the proposed action. A discussion of potential cumulative effects is provided at the end of the chapter.

4.2 LAND USE

4.2.1 No Action Alternative

If no construction would occur, there would be no change in zoning and no impacts on land use.

4.2.2 Proposed Action

The proposed action would be consistent with existing zoning. There would be no significant adverse impacts on residential areas, existing communities, or land use.

Operation of the Back End Facility

Solyndra would lease a facility that is already zoned for Solyndra's intended commercial uses. Operation of the Back End facility would, therefore, be consistent with existing zoning and would not result in any impacts on residential areas or existing communities.

4.3 VISUAL RESOURCES

4.3.1 No Action Alternative

If no construction would occur, there would be no change in the visual setting and no impact on visual resources.

4.3.2 Proposed Action

The proposed development is planned to be compatible with the intensity and architectural parameters (land uses, floor area ratio, bulk and massing limits, lighting standards, height, etc.) specified in the City of Fremont General Plan and Zoning Ordinance, subject to approval by the

Zoning Administrator. The proposed setback is within the range of setbacks of other buildings along Kato Road. The building height is not within the limitations of the Zoning Ordinance but is similar to surrounding buildings. A Zoning Administrator Permit would be required to allow for the building height. The building would be approximately 1,275 feet in length; however, due to the site configuration, the bulk of the building would be shielded by adjacent structures, leaving the narrowest portion of the building fronting Kato Road. The configuration would still provide view corridors from I-880 to the Mission Hills to the east. Due to the change in topography of the site and the necessity of having a level building pad, the site would be graded such that the front of the site (Kato Road side) would be raised approximately 10 feet from the current elevation, and the rear portion of the site would be lowered approximately 10 feet. Lighting throughout the project site would be similar to that of the surrounding industrial properties and would not create significant light or glare above existing levels in the area.

The proposed action would have no significant adverse impact on visual resources.

4.4 AIR QUALITY

4.4.1 No Action Alternative

If no construction would occur, there would be no new emissions or changes in air quality over baseline conditions described in Section 3.4, Air Quality. Not constructing this photovoltaic manufacturing facility would decrease the number of solar panels on the market, thus decreasing the potential for replacing energy sources that burn fossil fuels and emit greenhouse gases with renewable solar power. The air quality and global climate change benefits from reduced emissions of greenhouse gases and other air pollutants would not occur.

4.4.2 Proposed Action

Construction

Grading and construction for the Fab 2 facility would result in short-term adverse air quality impacts such as dust generated by clearing and grading activities, exhaust emissions from gas- and diesel-powered construction equipment, and vehicular emissions associated with the commuting of construction workers. Estimates of air emissions for the project construction activities are shown in Table 4-1.

Table 4-1
Construction Emissions (tons/yr)

	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_{2e}
2009 Construction Emissions	0.55	4.14	5.97	0.01	0.47	0.24	844.73
2010 Construction Emissions	7.61	8.59	13.19	0.02	0.48	0.39	1,981.55
2011 Construction Emissions	0.26	1.90	3.01	0.00	0.11	0.09	486.41
Total	**8.42**	**14.63**	**22.17**	**0.03**	**1.06**	**0.72**	**3,312.69**
Emission Threshold (tpy)[1]	100	100	100	NA	NA	NA	NA
Regional Emissions[2]	393	521	2,067	68	208	86	NA
% of Action Emissions Compared to Regional Emissions	0.02	0.03	0.01	0.00	0.01	0.01	NA

Source: URBEMIS 2007.
NA=Not Applicable; CO_{2e} = greenhouse gas emissions
Assumptions: 30-acre development site. Site preparation and building construction occur from June 2009 to March 2010, and interior building finishing occurs from April 2010 to June 2011. Standard phasing and equipment usage based on default values in URBEMIS 2007 computer model.
[1]Emission Threshold: ROG, NOx, and CO emission thresholds are based upon federal Clean Air Act Conformity threshold levels.
[2]Regional Emissions taken from the Bay Area Air Quality Management District 2005 Emission Inventory Summary Report released in December 2008.

As shown in Table 4-1, the total construction emissions would not exceed the Clean Air Act annual emission thresholds and would be less than 10 percent of regional emissions. In addition, fugitive dust emission quantities would be less than significant based on the BAAQMD control measures that would be adopted as part of the project and are required by the Mitigated Negative Declaration approved for the project by the City of Freemont (see Section 2.2.1). BAAQMD considers a project's construction-related fugitive dust impacts to be less than significant if all required dust control measures are implemented. These measures would be adopted by Solyndra and are considered part of the proposed action being reviewed in this EA.

Operations

Operational emissions would be realized from the Fab 2 facility as well as from commuter and delivery vehicles. An emergency diesel generator would generate emissions of criteria pollutants when running. The generator would only operate during emergencies involving power outages, which are rare, and during scheduled tests of the generator. An air permit would be obtained for this generator, and emissions would be regulated under that permit. Process-related air emissions would be limited to ammonia and hydrochloric acid vapors. All emissions from process equipment would be passed through a fume scrubbing system

prior to release to the atmosphere and would also be regulated under an air permit (see Section 2.1.3).

The project would result in approximately 595 personal vehicle round trips per day for the Fab 2 facility and 360 personal vehicle round trips per day for the Back End facility. The Fab 2 facility would generate 7 tractor-trailer trips per day and 8 tanker truck trips per week under full operational conditions. The Back End facility would generate 28 truck trips per week between facilities, 37 truck trips per week for materials to the facility, 55 truck trips per week for panel shipping, and 12 truck trips per month for waste disposal and recycling. The majority of the vehicles would be powered by gasoline and gasoline-electric hybrid technologies in the first few years of the project's lifespan, with delivery trucks, tractor-trailers, and tankers being largely fueled by diesel. Over the 30-plus-year lifespan of the project, it is expected that an increasing number of the trips would be fueled by hydrogen fuel cells and renewable energy-sourced electricity, with decreasing amounts of fossil fuel-related emissions being generated. Vehicle emissions are shown in Table 4-2, Full Buildout Vehicle Emissions.

Solyndra's commuter program, described in Section 3.4, is being designed to reduce vehicle use by employees through carpooling, the use of transit, and the use of shuttle buses. This program would reduce the project-related personal vehicle traffic emissions shown on Table 4-2 and would minimize air quality impacts.

Table 4-2
Full Buildout Vehicle Emissions (tons/yr)

	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_{2e}
Fab 2 Personal vehicle emissions	2.05	3.45	28.01	0.03	4.68	0.90	2,558.03
Back End Personal veh. emissions	1.24	2.09	16.95	0.02	2.83	0.55	1,547.72
Fab 2 facility truck emissions	0.24	3.99	1.20	0.00	0.39	0.10	595.14
Back End facility truck emissions	0.55	9.54	3.25	0.01	1.07	0.42	1,569.4
Total	**4.08**	**19.07**	**49.41**	**0.06**	**8.97**	**1.97**	**6,270.29**
Emission Threshold (tpy)[1]	100	100	100	NA	NA	NA	NA
Regional Emissions[2]	393	521	2,067	68	208	86	NA
% of Action Emissions Compared to Regional Emissions	0.01	0.04	0.02	0.00	0.04	0.02	NA

Source: URBEMIS 2007.
NA=Not Applicable; CO_{2e} = greenhouse gas emissions
Assumptions: Fab 2 Personal vehicles: 1,190 one-way vehicle trips per day, 12.5 miles per trip; a vehicle commuter fleet mix of light autos, light and medium trucks, and motorcycles; and a 2011 operating year.
Back End Personal vehicles: 720 one-way vehicle trips per day, 12.5 miles per trip; a vehicle commuter fleet

mix of light autos, light and medium trucks, and motorcycles; and a 2011 operating year. Fab 2 facility—Tanker trucks: 16 one-way trips per week, 50 miles per trip. Tractor-trailers: 14 one-way trips per day, 50 miles per trip. Back End facility—Tanker trucks: 2 one-way trips per week, 50 miles per trip. Tractor-trailers: 110 one-way trips per week, 100 miles per trip (shipped product) and 18 one-way trips per month (waste disposal). Other trucks: 56 one-way trips per week between Front End and Back End facility, 25 miles per trip; 72 one-way trips per week, 50 miles round trip (material products to facility), and 6 one-way trips per month, 50 miles per trip (waste disposal).

[1]Emission Threshold: ROG, NOx, and CO emission thresholds are based upon federal Clean Air Act Conformity threshold levels.

[2]Regional Emissions taken from the Bay Area Air Quality Management District 2005 Emission Inventory Summary Report released in December 2008.

Gasoline- and diesel-powered vehicles would result in emissions of several criteria pollutants and greenhouse gases. The marginal nonattainment (federal) and nonattainment (state) status for ozone of the San Francisco Bay Area air basin would be directly worsened by the increase in emissions of vehicle trips through the emission of ozone precursors in the first few years of the project. This impact is expected to lessen over time as fossil-fueled vehicles are replaced with cleaner technologies. The nonattainment (state) status for $PM_{2.5}$ and PM_{10} for the air basin would also be directly worsened by the increase in emissions of delivery vehicle trips through the emissions of diesel exhaust. This impact too is expected to lessen over time as delivery vehicles are converted to less-polluting diesel engines, and less-polluting fuels other than diesel further into the future.

As shown in Table 4-2, the annual vehicle emissions would not exceed the Clean Air Act annual emission threshold levels and would be less than 10 percent of regional emissions. The total construction emissions and annual vehicle emissions shown in Tables 4-1 and 4-2 combined, though representing more than one calendar year of emissions, also would be less than the Clean Air Act annual emission threshold levels and less than 10 percent of regional emissions. Because emissions would be less than the relevant CAA conformity threshold levels for federal actions in the San Francisco Bay Area Air Basin (100 tons per year each of ozone precursors [volatile organic compounds and nitrogen oxides] and 100 tons per year of carbon monoxide) and less than 10 percent of annual regional emissions, this action would not be subject to the Clean Air Act general conformity rule.

In addition to the construction and vehicle emissions estimated in Tables 4-1 and 4-2, the operation of Fab 2 and the Back End facility would result in the indirect emission of greenhouse gases as a result of fossil fuel energy use.[4] This is not expected to have a significant impact on

[4] Pursuant to CEQA, the City of Fremont reviewed the Solyndra project. The City estimated that the proposed project would generate 55,000 metric tons of CO_2 annually based on emissions from consumption of electricity, natural gas, and motor vehicle trips associated with the Fab 2 facility. The City concluded that "[t]he project could annually replace or avoid .6% of the statewide emission of 2008 while

greenhouse gas emissions since the facility would be designed to minimize fossil fuel energy use by using solar energy for up to 75 percent of the facility's energy requirements. In addition, emissions from the manufacture of photovoltaic panels would be offset by the increased availability of photovoltaic panels for solar energy production in the marketplace, thus decreasing emissions of air pollutants and greenhouse gases to the environment. This offset effect is the purpose of the project and would have a beneficial impact by contributing to the reduction of global levels of greenhouse gases.

Over its estimated 30-year projected life, Solyndra expects the proposed combination of Fab 2 and the Back End facility to produce photovoltaic panels sufficient to generate 12.6 gigawatts of electricity under peak conditions. Over the life of these panels, they can be expected to generate over 400 trillion kilowatt-hours of emission-free electricity. Assuming that this capacity displaces electricity produced by conventional power plants and combined-heat-and-power plants, Solyndra has estimated that the proposed facilities would reduce greenhouse gases and other air pollutants as follows:

- 245 million metric tons of carbon dioxide;
- 1 million metric tons of sulfur dioxide; and
- 380 thousand metric tons of nitrogen oxides.

Decommissioning

Decommissioning would result in variable levels of air emissions, depending on which course of action Solyndra takes. Sale of the building as-is would result in no emissions. Replacing internal production lines would result in no emissions. Performing structural renovations would produce minimal emissions. Demolishment and reconstruction would require a new environmental compliance analysis as well as permits and approvals from the City of Fremont and would likely involve some air quality impacts.

Operation of the Back End Facility

Use of the leased facility would generate transportation-related air quality impacts as described in Table 4-2. DOE does not anticipate significant impacts related to the Back End Facility; however, once a site is selected, DOE will undertake review, as appropriate, to determine if a supplement to this EA is necessary.

individually generating .012% of statewide emissions" and found that the project would not result in adverse impacts related to global climate change.

4.5 NOISE

4.5.1 No Action Alternative

If no construction would occur, there would be no impact on noise levels in the project area.

4.5.2 Proposed Action

Construction and demolition activities would generate temporary increases in ambient noise levels that may impact adjacent properties. These activities would be required to comply with the City of Fremont's Noise Ordinance, which limits construction to certain times of the day to reduce noise to acceptable levels. No sensitive receptors are located near the site, and no project-specific mitigation measures are required for noise impacts on nearby receptors.

The primary noise sources affecting the project site and office component is the 1-880 freeway. Because of its proximity to I-880, the project site is subject to continuous noise exposure from freeway-related noise in excess of 65 dB. Based on the proposed setback from the freeway and the rail line for the office portion of Fab 2, as well as the typical noise attenuation properties of glass curtain walls and other proposed building materials, the project should be able to attain the City of Fremont General Plan ambient noise standard. To verify compliance with the prescribed standard and reduce potential noise impacts, the City of Fremont has prescribed in the MND that prior to issuance of the building permit, an acoustical assessment by a qualified acoustical consultant shall verify that final construction details for the office area of the project design achieve the 45 dB noise standard (City of Fremont 2008d).

Solyndra has indicated that Fab 2 would eventually require an on-site electrical substation to provide additional power to the plant when it is operating at full buildout capacity. Electrical facilities such as substations require approval of a Zoning Administrator Permit in accordance with Section 8-21508 of the City's Zoning Ordinance. At the time the electrical substation is needed, a separate environmental review will be conducted to ensure that Fab 2 complies with the applicable provisions of the City's Noise Ordinance. The maximum Ldn allowed by the Zoning Ordinance for electric service uses is 70 dB when located adjacent to other industrial uses and 65 dB when located adjacent to office, retail, or other noise-sensitive uses. On-site noise attenuation would be applied to the substation at the time detailed plans are available for review.

Operation of the Back End Facility

Solyndra would lease a facility that is already zoned for Solyndra's intended commercial uses. Noise levels associated with operation of the back end facility would, therefore, be consistent with prior or existing noise levels at the unidentified commercial site.

4.6 GEOLOGY AND SEISMICITY

4.6.1 No Action Alternative

If no construction would occur, there would be no exposure of any people or structures to the above-mentioned risks.

4.6.2 Proposed Action

There is no risk of landslide, fault rupture, or slope failure at the project site.

All structures on the site would employ appropriate engineering designs that are in conformance with geotechnical standards for construction as required by the 2007 California Building Code and adopted by the City of Fremont. A geotechnical engineering study would be prepared for the site. The recommendations and conclusions presented in the study would be incorporated into the design and construction of the project to minimize potential soil- or foundation-related problems, including issues related to liquefaction. As a result, geologic and seismic risks from the project would be minimized and not significant.

4.7 WATER RESOURCES

4.7.1 No Action Alternative

If no construction would occur, there would be no impacts on water resources.

4.7.2 Proposed Action

Water Supply

The proposed manufacturing process requires approximately 0.7 million gallons per day. The Alameda County Water District (ACWD) has worked with the applicant to obtain a commitment ensuring that of this amount, 25 percent would be conserved through on-site water recycling for the plant's cooling towers, fume scrubbers, and various other phases of the manufacturing process. The daily consumption of water equals 0.52 million gallons per day after recycling measures are factored in (City of Fremont 2008d).

Due to the size of the project, the City of Fremont requested that ACWD conduct a Water Supply Assessment (WSA) to determine whether its current water supplies would be able to satisfy the project's demand in accordance with the provision of California Senate Bill 610. The WSA determined that the demands of the project are consistent with the forecasted demands for industrial development under ACWD's current Urban Water Management Plan (UWMP). The WSA considered updated factors affecting the availability of supply in addition to the information originally included in the 2005 UWMP regarding water supply sources. The WSA found that during critically dry years or multiple dry years when

water supply shortages may occur, the project's demand would not result in increased shortages since demands for industrial uses of a similar nature on the site have already been factored into the UWMP even with adjusted supply estimations. On September 11, 2008, ACWD's Board of Directors held a hearing and adopted the findings of the WSA. In so doing, ACWD determined that (1) it has sufficient supplies to meet its existing customer demands and those of the proposed project under normal year water conditions; (2) that water is available for the project; and (3) the project does not cause a change in planned service levels to other users during dry-year scenarios. In addition, the applicants have agreed to plumb the proposed Fab 2 so that it can utilize recycled non-potable water from ACWD (commonly known as "purple pipe") when such water service becomes available to ACWD's customers. No project-specific mitigation is required due to the determination that available water supply exists; however, a condition of approval will be placed upon the project requiring the applicant to plumb the building to allow for future connection to a "purple pipe" recycled water system and to extend connections to their Kato Road frontage for future tie-in to a recycled water system. Additionally, ACWD has reviewed the transmission capacity of water lines serving the site and has determined adequate capacity and pressure exists to serve the site (City of Fremont 2008d).

Operation of the Back End Facility

Solyndra would lease a facility that is already zoned for Solyndra's intended commercial uses. Water consumption levels associated with operation of the Back End facility would, therefore, be consistent with prior or existing water consumption levels at the unidentified commercial site.

Wastewater

The Union Sanitary District (USD) is the sanitary sewer service provider for the project site and the surrounding region. USD's infrastructure serving the region includes sewer pipes, pump stations, and wastewater treatment plants. The project site is served by a 12-inch diameter gravity-flow sewer main in Kato Road. The Irvington Pump Station receives the wastewater from this main and transmits it to the Alvarado Wastewater Treatment Plant in Union City. The estimated wastewater discharge flow from the proposed Fab 2 is 450 gallons per minute, or the equivalent of 0.65 million gallons per day. USD has reviewed the proposal and indicated that its sewer system, pump station, and wastewater treatment facility serving the project all contain adequate capacity to receive the forecasted wastewater quantities from the proposed project (City of Fremont 2008d).

Operation of the Back End Facility

Solyndra would lease a facility that is already zoned for Solyndra's intended commercial uses. Wastewater generation volumes from

operation of the Back End facility would, therefore, be consistent with prior or existing wastewater generation volumes at the unidentified commercial site.

Water Quality

To protect surface waters during construction, the project would require a General Construction Stormwater Permit from the California State Water Resources Control Board. As part of this permit, Solyndra would be required to submit a Stormwater Pollution Prevention Plan (SWPPP), which would include construction-phase BMPs to prevent exposed soils from leaving the project site. Based on the proposed site plan and preliminary grading and drainage plans, the City of Fremont determined that conformance to the stormwater management regulatory requirements is achievable and the project would not have significant impacts on hydrology (City of Fremont 2008d).

The existing low permeability of the on-site soils means that the addition of impervious surfaces would not result in a substantial increase in runoff when compared with existing conditions. At an average rainfall of 14.38 inches per year and an impervious surface area of 991,348 square feet (22.76 acres), the constructed project is expected to generate an average of approximately 27.3 acre-feet (8.9 million gallons) of stormwater per year. Project plans include bioswales and detention basins to both improve the quality of the runoff and to delay the discharge of the runoff into the sewer system so as to minimize the site's contribution to the system during peak flows.

The proposed development is classified as a Group I project (creating more than one acre of impervious surface) with an estimated 1,035,576 square feet (or 23.78 acres) of impervious surface. It is therefore subject to C.3 stormwater runoff controls for on-site treatment of stormwater runoff. C.3 is a provision of the Alameda Countywide Municipal Stormwater National Pollution Discharge Elimination System (NPDES) permit that requires each discharger to control the flow of stormwater and stormwater pollutants from new development and redevelopment sites. The City of Fremont applies a general policy that requires 50 percent of stormwater runoff be treated with landscape-based Best Management Practices (BMPs) rather than mechanical-based BMPs and 100 percent of all volumes be treated on the site before discharging into the public storm drain system. The conceptual stormwater management plan for the site has determined that approximately 5.2 acres of landscaped area (or 18 percent of the site) is needed for volume/flow-based controls in order to comply with C.3 requirements, and that adequate area has been provided on the site to implement the plan. The plan identifies the front setback area at the west end of the site between the Kato Road property line and the building as the location for the primary landscape-based treatment area and flood control detention basin for the site. Landscape

planters around the perimeter of the site would also serve as additional treatment areas for stormwater runoff (City of Fremont 2008d).

The site is located in an area that has been designated as potentially susceptible to hydromodification, defined in the Alameda Countywide Clean Water Program C.3 Stormwater Technical Guidance as changes in natural watershed hydrological processes and runoff characteristics caused by urbanization or other land use changes that result in increased stream flows and sediment transport. Because stormwater runoff from the site would drain to an existing tidally influenced concrete-lined flood control facility downstream, the City of Fremont determined that hydromodification does not apply to the project's runoff (City of Fremont 2008d).

Decommissioning would not involve impacts to water resources unless demolition was involved, in which case additional permitting requirements with the City of Fremont and potentially the California State Water Resources Control Board would have to be met, which would protect water resources.

Floodplains

The development of the site would require the Zone AH and Zone B areas to be raised to accommodate the necessary flat pad for the building. This change in grade would elevate the building above the 500-year base flood elevation. The City of Freemont determined that the grading and drainage plans for the project have been designed to prevent flooding, that the site is not located in an area that is susceptible to flooding or damage "in the event of a levee or dam failure or a tsumani, seiche or mudflow," and that as a result the proposed project would "not expose people to significant risks involving flooding, and no mitigation is necessary" (City of Fremont 2008d).

4.8 BIOLOGICAL RESOURCES

4.8.1 No Action Alternative

If no construction would occur, there would be no impact on biological resources or changes to the baseline conditions described in Section 3.8, Biology.

4.8.2 Proposed Action

Construction

Protected and Sensitive Habitat

Construction would have no significant adverse impact on wetlands or sensitive habitats (habitats that could support state or federally listed species). The proposed project area is ruderal grassland habitat within an urban developed area. The closest riparian habitat is found along the Alameda County flood control channel. The only potential for impacts

would be through polluted runoff from the construction site. Polluted runoff from the site is highly unlikely due to the implementation of BMPs during construction, the distance to the nearest drainage, and the level topography of the project site. Despite limited potential for effects to nearby drainages, Solyndra would minimize the potential for erosion through implementation of erosion control measures. Construction would also require enrollment under the General NPDES for Construction Stormwater, which includes preparation of a SWPPP to minimize any threats of water quality degradation.

Threatened and Endangered Species

There would be no effect to federally threatened or endangered species. No special status plant species are found at the site because of its recent disturbance and lack of suitable habitat and no record of their occurrence exists nearby. Threatened and endangered animal species would also not be affected by the project. The habitat at the site is not suitable for the threatened and endangered species known to occur in the area and no record of their presence has been recorded at the site.

Special Status Species

The only potential special status habitat at the project site is for burrowing owls. Due to the likelihood that the subject site still contains suitable burrowing owl habitat, the City of Fremont MND for the project requires Solyndra to take measures that would avoid any impacts to any burrowing owls that may be present on site. These measures would be adopted by Solyndra and are considered part of the proposed action being reviewed in this EA. The following measures are outlined in the MND for the project and shall be incorporated into the project conditions of approval and written into the construction drawings:

1. No more than 30 days prior to the start of construction activity, a focused survey for burrowing owls will be conducted by a qualified biologist, in accordance with the most recent version of the CDFG protocol to identify active burrows on and within 250 feet of construction and staging areas. The preconstruction surveys shall be conducted regardless of the time of year in which construction occurs. If there is a gap of more than a month in project activity in an undisturbed construction area, the area shall be resurveyed prior to re-initiation of activity. Prior to the commencement of construction after the survey, a written verification by the biologist of the survey shall be submitted to the City of Fremont. If no occupied burrows are found in the survey area, no further action is necessary.
2. In addition to preconstruction surveys, the contractor, in consultation with a biologist, shall provide an educational presentation for job site construction workers that explains and identifies burrowing owl considerations so as to avoid other

accidental incidents when a biologist is not present. Written verification of participation in an educational program shall be provided by the biologist prior to initial commencement of work on the site, and signs or posters shall be maintained on the site in a prominent location visible to workers that identify burrowing owls.

3. If occupied burrows are found in the survey area, on-site passive relocation techniques (e.g., one-way doors) may be used to encourage owls to move to alternative burrows outside of the impact area. Notification shall be given to the city upon discovery. A protection plan shall be prepared by the biologist and submitted for city review. Relocation or disturbance of owls cannot occur during the nesting season (April through August). A qualified biologist may verify through noninvasive methods that the burrow is no longer occupied, and prevention measures may then be incorporated to prevent reoccupation during the nesting season.
4. If a burrow is occupied during the nesting season, impacts shall be avoided by establishing a 250-foot buffer around the burrow where no activity shall occur. The size of the buffer area may be adjusted if a qualified biologist determines it would not be likely to have adverse effects on the burrow. No project activity shall commence within the buffer area until the nesting season has ended, or a qualified biologist confirms that the burrow is no longer occupied or that the young have fledged (City of Fremont 2008d).

Wildlife Migration and Nursery Sites

Construction would not interfere with the movement of any native resident fish or wildlife species or with any known established migratory wildlife corridors. Common wildlife species such as raccoons, rodents, and bird species may currently use the area. The developed area does not provide sufficient cover, food, or water for abundant wildlife. The trees lining the existing driveway will remain, while the trees along Kato Road would be removed and replaced with new London Plane trees after the berm is regraded during the creation of the proposed detention basin. Because of the developed nature of the area, construction would not affect migratory wildlife. Nursery sites are not present at the proposed site, although the grassy area could be used by migratory songbirds. The proposed project would not take or otherwise harass migratory birds.

Operations

Operations would be contained inside the commercial structures, and all discharge of water and waste would be monitored and would abide by local, state, and federal laws. The operation of the proposed project would have no significant adverse impact on biological resources.

Decommissioning

Decommissioning would not have any direct impacts on biological resources. Demolition would require additional permitting from the City of Fremont and potentially the California State Water Resources Control Board, which would protect biological resources.

Correspondence with USFWS

At DOE's request, EMPSi sent a letter to the U.S. Fish and Wildlife Service on October 20, 2008 describing the justification for a No Effect determination. The letter described the Proposed Action, the existing property, species accounts from both the USFWS and the California Natural Diversity Database, and the current status of the project. This letter is included in Appendix A.

4.9 CULTURAL RESOURCES

4.9.1 No Action Alternative

If no construction would occur, there would be no impact on historic, archaeological, or Native American resources.

4.9.2 Proposed Action

No significant adverse impacts on historic, archaeological, or Native American resources are expected due to the expected lack of these resources at the project site, as described in Section 3.9, Cultural Resources; however, very large volumes of grading would be required to provide level building and parking lot surfaces on the site. Should any human remains or historical or unique archaeological resources be discovered during grading activities, the provisions of CEQA Guidelines, Section 15064.5 (e) and (f) would be followed to reduce impacts to a less-than-significant level. An educational presentation will be provided for job site construction workers so that they will be better able to identify human remains or historical or unique archaeological resources discovered during grading activities.

Provisions of the CEQA Guidelines, Sections 15064.5 (e) and (f) would also be followed during site development work and would reduce any potential impacts. These provisions detail procedures to be followed in the event of the accidental discovery or recognition of any human remains or historical or unique archaeological resources. Operation and decommissioning phases would have no impact on cultural resources.

Correspondence with SHPO

At DOE's request, EMPSi sent a letter to the SHPO on October 13, 2008, requesting concurrence with DOE's determination of No Historic Properties Affected under 36 CFR Part 800.4(d)(1) for the Fab 2 Front End site. The SHPO responded with a letter dated January 8, 2009, requesting additional information, including an Area of Potential Effect

(APE) map and a more detailed description of the proposed project. The SHPO also suggested that a records search from the Northwest Information Center (NWIC) may be helpful to identify potential subsurface archaeological sites. The letter also requested that the California Native American Heritage Commission (NAHC) be contacted for a list of interested tribes and that DOE provide each of the parties listed an opportunity to comment on the proposed project.

On January 15, 2009, DOE responded to the SHPO letter by submitting a records search request for archaeological resources to the NWIC and a letter to the NAHC requesting both a list of tribal parties with interests in the project area and a request for identification of sacred grounds within the project area. DOE provided each of the parties listed in the NAHC letter with an opportunity to comment on the proposed project No additional historic, archaeological, or Native American resources were identified as a result of these requests, as described in Section 3.9 of this EA. The additional information requested by the SHPO was submitted on February 18, 2009. DOE received concurrence on its finding of No Historic Properties Affected from the SHPO on March 4, 2009. Appendix A contains SHPO, NWIC, and NAHC correspondence.

4.10 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

4.10.1 No Action Alternative

If no construction would occur, personnel levels at the Solyndra facility would remain relatively constant, resulting in no impacts on socioeconomic resources or minority or low-income populations over baseline conditions described in Section 3.10, Socioeconomics and Environmental Justice.

4.10.2 Proposed Action

Under the proposed action, direct and indirect beneficial impacts on socioeconomic resources would occur as a result of additional job opportunities. Short-term impacts would include construction employment for the proposed 580,000-square-foot Fab 2 building. Long-term benefits include up to 240 additional employees for the Front End manufacturing process and 260 additional employees for the Back End manufacturing process. The increase in employment for the manufacturing process would be gradual, with full employment not expected until 2011. Office employment would represent an additional 150 to 350 job opportunities for Fab 2 and approximately 100 for the Back End facility. In total, maximum projected employment under the proposed action at Fab 2 is an additional 590 employees, which is a 100-percent increase in personnel over current levels at Fab 1 and Solyndra's headquarters. The actual level of additional employees may be less than the projected maximum; current plans call for approximately 400 to 450 jobs. Maximum projected employment for the Back End facility is 360 employees. Additional

beneficial impacts are anticipated as a result of indirect spending and job creation in local communities.

Employment at the Fab 2 facility would continue to represent less than one percent of total employment in the ROI. The project is not expected to directly or indirectly induce substantial population growth in the area. As such, impacts on the local housing market, social services, and the overall income and employment levels of the ROI would likely be minor to negligible.

Total employees at the Back End facility at any given time would be 130 manufacturing employees and 100 office employees. As the proposed use of the Back End facility is expected to be similar to prior or existing uses at the unidentified commercial site, no impacts to the local community are expected. Due to shifts at the Fab 2 Front End facility, total employees at the plant would be limited to a maximum of 120 manufacturing employees and 350 office employees at a given time, thereby limiting impacts on the local community.

Implementing the proposed action is not anticipated to result in significant adverse disproportionate environmental impacts on low-income populations, minority populations, or children. No low-income populations have been identified in the surrounding community. Public schools and residences are one-quarter mile or greater from the proposed Fab 2 facility; therefore, the impacts of air emissions, noise, or construction dust on children or minority populations in the area would be minimal. In addition, construction of new front end facilities and offices buildings would occur near existing Solyndra manufacturing facilities and headquarters in areas currently vacant and zoned for industrial use.

Decommissioning would have a minor adverse impact on socioeconomics in the project area due to the dissolution of jobs.

4.11 PUBLIC HEALTH AND SAFETY

4.11.1 No Action Alternative

If no construction would occur, no personnel or members of the public would be exposed to hazardous conditions beyond those that currently exist.

4.11.2 Proposed Action

All project activities during construction, operation, decommissioning, and operation of Fab 2 and the leasing and operation of the Back End facility would be carried out in compliance with OSHA requirements, reducing potential impacts on workers. The construction site would be fenced against unauthorized entry and noticed with “no trespassing” signs. Health and safety impacts on the general public would be minor and adverse.

Since there is no documentation of contamination at the project site, the potential for exposure of construction workers to contaminated soils is minimal.

Daily operations at the manufacturing plant would involve the storage, handling, and transporting of hazardous materials. The proposed Solyndra project would require numerous tanks containing hazardous materials on the site, the largest of which include two 10,000-gallon tanks of ammonium hydroxide (a base/alkaline) and one 7,500-gallon tank of hydrochloric acid. The other tanks would contain chemicals including thiourea, sodium hydroxide, sulfuric acid, and cadmium sulfate, among others. These and all other hazardous materials would be delivered and stored in accordance with regulatory specifications.

An Off-site Consequences Analysis was conducted as part of Solyndra's Risk Management Plan that was submitted to the City of Fremont. The plan determined that the worst-case scenario (the release of an entire 10,000-gallon tank of ammonium hydroxide) would result in the release of 3.64 pounds per minute to the outside atmosphere, with an estimated toxic endpoint of less than 0.1 mile. The closest public school is Warm Springs Elementary at approximately 1,400 feet northeast of the site, and Sunshine Kid's Preschool is located approximately 1,500 feet east of the site; both schools are more than 0.25 mile from the project site, well outside of the 0.1-mile radius. There are also no hospitals, senior housing/residential care facilities, single-family homes, or other sensitive receptors within a 0.25 mile of the project site.

All hazardous materials stored on the site would be required to be delivered and disposed of by a licensed chemical transporter. The daily operations of the facilities would comply with regulations regarding hazardous materials according to the standards of the 2007 California Fire Code (CFC). Under those requirements, Solyndra is required to submit a Hazardous Materials Business Plan (HMBP), which would be reviewed by the City of Fremont's Fire Department during the building permit process to ensure that it conforms to the standards of the 2007 CFC. The project would require administrative approval through the building permit process to ensure that the design, layout, and construction of buildings would not interfere with any emergency response plans or evacuation plans and would not pose a public health hazard.

Workers in the Fab 2 facility would be handling hazardous materials and wastes. All hazardous substances would be handled per the Material Safety Data Sheets for that substance, per OSHA safety requirements, and per RCRA handling, disposal, and storage requirements. All hazardous wastes would be contained and picked up by hazardous waste handlers, who would handle and process these materials in accordance with OSHA and RCRA regulations.

The City has concluded that there are no anticipated significant impacts involving the storage, use, or handling of hazardous materials (City of Fremont 2008d).

Risk Scenarios

Various risk scenarios exist for the Fab 2 facility. These scenarios include the following:

Bulk Chemical Delivery System

- Leaks from the system, which could introduce chemicals to the facility's floor and air, potentially resulting in exposure of workers;
- Vapor release, which would introduce toxic chemicals to the facility's air, potentially resulting in exposure of workers;
- Contact exposure, due to leaks, releases, or human error, which could result in chemical burns and absorption of toxic chemicals; and
- Overfill of tanks, which could cause spills and releases of chemicals to the facility's floor and air, potentially resulting in exposure of workers.

Scrubber Exhaust and Fume Scrubber

- Loss of exhaust and loss of pH control, which could result in release of acid or ammonia to the environment and exposure of people nearby to chemicals that may cause adverse health effects; and
- Failure of primary containment resulting in leak of acid, which could expose workers to acid contact on their skin or acid vapor in their eyes or respiratory system.

Wastewater Treatment System

- Failure of treatment resulting in discharge of "out-of-spec" wastewater, which would result in potentially toxic waters being released into the Union Sanitary District sanitary sewer system. This could pose adverse ecological impacts when these waters are treated and reach San Francisco Bay; and
- Failure of tanks or piping resulting in leak of wastewater or treatment system chemicals. This scenario could result in the exposure of humans or the environment to hazardous substances.

All Systems

- Human error, which could result in exposure of humans or the environment to hazardous materials; and
- Sabotage by personnel, which could result in a variety of risky health and safety situations.

The best management practices described in Section 2.1.3 would greatly reduce the risk of any of these scenarios occurring.

Evaluation of Terrorism-Related Impacts

DOE believes that the proposed Solyndra facility presents an unlikely target for an act of terrorism and has an extremely low probability of attack. The potential for the proposed action considered in this EA to result in terrorism-related activity or impacts would be negligible. The entire Fab 2 facility would be under 24-hour camera surveillance. All areas of the buildings would be access controlled, with security performing regular rounds. All authorized personnel (employees and contractors) would be issued access key fobs to regulate entry into the facility, including office and processing areas. These measures would limit access and deter intruders.

4.12 TRANSPORTATION

4.12.1 No Action Alternative

If no construction would occur, no change in traffic levels would occur in the project area.

4.12.2 Proposed Action

Access to the project site would be provided from two separate driveways off of Kato Road. The existing two-way driveway serving the JC Paper facility at 47422 Kato Road will remain in its current location and provide access to the service areas and loading/receiving docks at the back of the proposed Fab 2 facility. The property owners of the JC Paper facility would provide the applicant with shared access rights via this driveway through easements that would be granted when the property is subdivided into two parcels. A second two-way driveway would be constructed at the opposite (southern) end of the property, which would provide the primary access for the company's employees and visitors. The proposed 609,000-square-foot Front End facility is estimated to generate 445 AM peak hour trips and 451 PM peak hour trips (Hexagon Transportation Consultants, Inc. 2008). Trips during construction of the facility would be less than those estimated at full operation.

Major roadways that provide access to Kato Road include Warren Avenue, Scott Creek Road, Mission Boulevard, Interstate 680, and Interstate 880. All of these roadways are heavily used by commuters and commercial/industrial traffic. A traffic impact analysis (TIA) was conducted by Hexagon Transportation Consultants, Inc. (hereafter referred to as Hexagon) in August 2008 to determine if the proposal would have significant impacts on the roadway network. The TIA analyzed three freeway ramps and seven intersections, as well as queuing levels at four of the busiest intersections in the area. Intersections and ramps are rated based on a Highway Capacity Model (HCM) level of service (LOS) scale, with LOS A indicating the best rating and LOS F indicating the worst rating. LOS D is the lowest acceptable level allowed by the City's General Plan for city signalized intersections. The study uses LOS D for Milpitas

signalized intersections as well as per Santa Clara Valley Transit Authority standards. If a project would result in the LOS of an intersection being reduced below LOS D, then the impact from that project is considered to be significant. Similarly, if an intersection is already operating below LOS D, a project's impact is considered significant if it causes a considerable contribution to the impact as measured by an average intersection delay increase of more than 4 seconds per vehicle.

The three freeway ramps that were analyzed in the TIA include the following:

1. 1-680 southbound to Mission Boulevard westbound;
2. 1-680 northbound to Mission Boulevard westbound; and
3. 1-680 northbound to Scott Creek Road westbound.

The seven intersections that were analyzed in the TIA include the following:

1. Warm Springs Boulevard and Mission Boulevard;
2. Warm Springs Boulevard and Warren Avenue;
3. Warm Springs Boulevard and Kato Road/Scott Creek Road;
4. Milmont Drive and Kato Road;
5. Milmont Drive and Dixon Landing Road (in the City of Milpitas);
6. California Circle and Dixon Landing Road (in the City of Milpitas); and
7. California Circle and I-880 northbound off ramps (in the City of Milpitas).

The LOS analysis utilized the standard Alameda County Congestion Management Agency traffic model to generate original destination estimates. The model estimated that 42 percent of the trips generated by the project would come from I-880, 29 percent would come from I-680, 22 percent would come from Warm Springs Boulevard, and the remainder would come from local streets connecting to Warren Avenue and Mission Boulevard. Traffic counts were provided by the City of Fremont from previous studies conducted during the Fall of 2007 and the beginning of 2008. Field checks were performed by Hexagon to confirm operations (City of Fremont 2008d).

The results of the LOS analysis when the project's trips are added to the existing conditions and trips expected to be generated by recently approved and/or currently pending projects in the vicinity of the site are depicted in Tables 4-3 and 4-4, below. It should be noted that the Mission Boulevard (SR 262) interchange with I-880 is in the final stages of

construction (estimated completion November 2008) and was considered completed for the project condition of 2009.

These tables show that traffic generated by the project would not cause the existing LOS at any of the seven intersections or the three freeway ramps to deteriorate below LOS D when combined with current traffic levels and additional traffic generated by recently approved or currently pending projects in the area. The intersection of Milmont Drive and Dixon Landing Road already operates at LOS F during the AM peak hour, but the project would not result in an increase in average intersection delay of more than 4 seconds at that intersection during that time. As such, the traffic generated by the project would not have a significant impact on existing levels of service of the transportation network (City of Fremont 2008d). Since construction would result in fewer vehicle trips than operation of the facility, construction traffic likewise would not have an impact on levels of service in the project area.

To address the incremental cumulative effects of the project, Solyndra is subject to the Fremont citywide traffic impact fees, which are mandated to address all types of cumulative effects of the project as a fair-share contribution to future traffic/roadway improvement projects (City of Fremont 2008d).

Further analysis was conducted of estimated queuing impacts at five of the busiest ramps/intersections, as well as for site access and on-site circulation, and these analyses determined that no significant impacts would result from the proposed project (Hexagon Transportation Consultants, Inc. 2008). Bicycle parking facilities would be required to be provided on the site as a condition of approval, and direct pedestrian/disabled access would be provided from Kato Road to the main entrance of the Fab 2 facility. As such, the project would not conflict with policies or plans supporting alternative transportation (City of Fremont 2008d).

Table 4-3

Freeway Ramp Levels of Service under Project Conditions

Ramp	Peak Hour	Lanes	Capacity	Volume	V/C[1]	LOS[2]
I-680 SB to WB Mission	AM	1	1,800	1,018	0.566	A
	PM	1	1,800	991	0.551	A
I-680 NB to WB Mission	AM	1	1,800	1,156	0.642	B
	PM	1	1,800	705	0.392	A
I-680 SB to WB Scott Creek	AM	1	1,800	894	0.497	A
	PM	1	1,800	301	0.167	A

Source: Hexagon Transportation Consultants, Inc. 2008
1 V/C = Volume-to-Capacity ratio.
2 LOS = Level of Service

Operation of the Back End Facility

To ensure that the proposed action does not degrade traffic conditions below an acceptable level, Solyndra would not select a Back End facility in a location whereby the proposed action would result in, or contribute to an unacceptable LOS (i.e. LOS E or F).

Table 4-4

Intersection Levels of Service under Project Conditions

		Background		Project			
Intersection	**Peak Hour**	**Ave. Delay[1]**	**LOS[2]**	**Ave. Delay[1]**	**LOS[2]**	**Incr. in Ave. Delay[3]**	**Impact?**
Warm Springs Blvd. and Mission Blvd.	AM	51.6	D	52.5	D	0.9	No
	PM	41.8	D	42.1	D	0.3	No
Warm Springs Blvd. and Warren Blvd.	AM	36.6	D	37.6	D	1.0	No
	PM	39.5	D	39.5	D	0.0	No
Warm Springs Blvd. and Kato Rd./Scott Creek Rd.	AM	40.3	D	41.2	D	0.8	No
	PM	48.7	D	49.0	D	0.3	No
Milmont Dr. and Kato Rd.	AM	47.5	D	48.4	D	0.9	No
	PM	29.8	C	31.9	C	2.1	No
Milmont Dr. and Dixon Landing Rd.*	AM	97.7	F	100.00	F	2.3	No
	PM	57.5	E	58.3	E	0.8	No
California Circle and Dixon Landing Rd.*	AM	46.3	D	52.6	D	6.3	No
	PM	42.8	D	43.7	D	0.9	No
California Circle and I-680 NB Ramps*	AM	12.8	B	12.9	B	0.1	No
	PM	21.8	C	22.1	C	0.3	No

Source: Hexagon Transportation Consultants, Inc. 2008

* Intersection is located in the City of Milpitas, where the average delay is the average critical delay (not the average delay for the entire intersection, as it is in Fremont). In Milpitas, an impact occurs if both the increase in average critical delay is more than 4 seconds and the increase in V/C is 0.01 or more.

[1] Average delay: in Fremont = intersection average delay; in Milpitas = critical movement average delay.

[2] LOS = Level of Service

[3] Increase in average delay represents increase (or decrease) in delay between background and project conditions.

Note: For background conditions relative to existing conditions, delays could decrease at the intersections of Warm Springs & Mission or Warm Springs & Warren due to the reassignment of traffic caused by the reconstructed interchange at I-880/Mission/Warren.

4.13 CUMULATIVE EFFECTS

A cumulative effect is defined as, "*the impact on the environment that results from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action*" (40 CFR Part 1508.7).

4.13.1 Identified Cumulative Projects

The cumulative projects listed below were identified and included in the cumulative effects analysis.

Bayside Marketplace Project

The Bayside Marketplace project is 0.7 mile south of the project site, across I-880. The project includes an extension of Fremont Boulevard to Dixon Landing Road and a new retail center on the easternmost 59 acres of the 147-acre site. No changes to the 88 acres of wetlands on the west are proposed; these are planned to be offered to the USFWS. The 59-acre development area has approximately 3,400 feet of frontage along I-880, with a regional access from the Dixon Landing Road interchange to the south as well as the Fremont Boulevard and Mission Boulevard interchanges to the north (City of Fremont 2008a).

Commercial Development

The project includes approximately 524,000 square feet of commercial/retail uses. A large, freestanding retail store anchor of approximately 151,000 square feet is proposed at the southern end. Another large anchor of approximately 142,000 square feet is proposed at the northern end. General retail stores and restaurants are to be built for the remaining 231,000 square feet located between the anchor sites. The shopping center will generally be one story, with a conceptual building height of up to 40 feet (City of Fremont 2008a).

Circulation, Parking, and Access

The project includes the extension of Fremont Boulevard from the north to Dixon Landing Road at the south end of the site. Fremont Boulevard will provide direct access to the site. Fremont Boulevard is an arterial road planned as an 88- to 104-foot-wide right-of-way that includes, on the west side, a 9-foot Class I San Francisco Bay Trail and, on the east side, a 5.5-foot-wide shoulder and 4-foot-wide walking path. A 50-foot buffer will be provided between the western edge of Fremont Boulevard's right-of-way and the 88 acres of wetlands to the west (City of Fremont 2008a).

Three bridges will be constructed for the project. Two of these bridges would be 85 feet wide and would be constructed for Fremont Boulevard over Flood Channel B and over Scott Creek. A third bridge would be approximately 36 feet wide and would be placed over Scott Creek to

internally connect the two portions of the shopping center (City of Fremont 2008a).

Utilities

Development of the project will require the installation of water and wastewater lines, electricity, telecommunications, gas lines, storm drains, construction of Fremont Boulevard extension, sidewalks, associated landscape irrigation, and street lighting. These utilities will connect to off-site connections primarily at Bayside Business Park Phase 1 (adjacent to the north), but also potentially through the Dixon Landing Road Interchange to the southeast or Kato Road to the east under I-880 (City of Fremont 2008a).

Warm Springs Village Project

The Warm Springs Village project involves the construction of 142 detached townhomes, 95 attached townhomes and flats, and 105 condominiums on the southeast side of Kato Road between Warm Springs Boulevard to the northeast and the Union Pacific Railway to the southwest. Portions of the project were under construction as of Fall 2007, with completion targeted for 2009 for the attached townhomes and flats, 2009-2010 for the detached townhomes, and sometime after 2009 for the condominiums. The applicant for this project is Terry Wang (City of Fremont 2008b).

Castilleja Project

The Castilleja project involves the construction of 114 new detached single-family homes on the southeast side of Kato Road, on the other side of the Union Pacific Railway from the proposed Solyndra project site. The construction of these homes was underway by the Fall of 2007 and is projected to be complete in the 2008-2009 timeframe. The applicant for this project is Robson Homes (City of Fremont 2008b).

I-880/Mission Boulevard Interchange and High Occupancy Vehicle (HOV) Lanes Project

The Mission/I-880 Interchange and HOV Lanes project is designed to enhance traffic efficiency, safety, and capacity in and around the interchange of I-880 and Mission Boulevard (State Route 262) (City of Fremont 2008c).

This project will improve traffic flows on the freeway as well as between I-880 and I-680 along Mission Boulevard. Local traffic circulation between commercial and industrial areas on both sides of I-880 will be improved by the extension of Warren Avenue over I-880. The project extends existing carpool lanes to connect with carpool lanes in Santa Clara County (City of Fremont 2008c).

This project is divided into Phases 1A, 1B, and 2. Phase 1A is fully funded, is under construction as of June 2008, and involves the following (City of Fremont 2008c):

- Direct connectors in each direction to/from I-880 and Mission Boulevard;
- New Warren Avenue overcrossing offering local traffic a direct connection across I-880, including bike lanes;
- Auxiliary lanes and HOV lanes in both directions on I-880 from Fremont Boulevard to the county line at Dixon Landing Road;
- HOV lanes added (by restriping existing roadway) on I-880 from Dixon Landing Road to SR-237/I-880 interchange in Milpitas;
- Widening of I-880 from three lanes in each direction to four lanes in each direction between Fremont/Cushing to the new interchange (I-880/Mission Boulevard); and
- Widening of I-880 from three lanes in each direction to six lanes in each direction between the new interchange (I-880/Mission Boulevard) to the county line.

Phase 1B is partially funded, and Phase 2 is not yet funded (City of Fremont 2008c).

BART Extension to Milpitas, San Jose, and Santa Clara

The Santa Clara Valley Transportation Authority proposes to construct a 16.1-mile extension of BART from the planned Warm Springs Station in Fremont to Milpitas, San Jose, and Santa Clara, formally named the Silicon Valley Rapid Transit Corridor (SVRTC) Project. The proposed BART line would most likely run immediately to the east of, and parallel to, the Union Pacific Railway lines that line the eastern edge of the proposed Solyndra project site (Santa Clara Valley Transportation Authority 2008; Bay Area Rapid Transit 2008).

4.13.2 Greenhouse Gases and Global Climate Change

DOE is not aware of any methodology to correlate the CO_2 emissions exclusively from the proposed project to any specific impact on global warming; however, studies such as the IPCC report support the premise that CO_2 emissions from the proposed project, together with global greenhouse gas emissions, will very likely have a cumulative impact on global warming. Although the project would contribute to cumulative increases in greenhouse gases and related climate change when combined with other projects globally through the emissions described in Section 4.4.2, Air Quality, emissions from the manufacture, assembly, and distribution of photovoltaic panels would be more than offset by the increased availability of photovoltaic panels for solar energy production in the marketplace. The use of these panels would decrease emissions of greenhouse gases to the environment and contribute to efforts ongoing globally to reduce greenhouse gases and slow climate change.

The European Photovoltaic Industry Association projects that by 2010, which is when Solyndra expects Fab 2 to be operational, global installations of photovoltaic panels will be in the range of 4,680 MW to 6,950 MW of power-generating capacity per year (European Photovoltaic Industry Association 2007). At 420 MW per year in capacity generation, Solyndra is expected to represent between 6 and 9 percent of global photovoltaic capacity generation. The U.S. market is projected to be between 1,000 and 1,400 MW annually, of which Solyndra is expected to represent between 30 and 42 percent. Holding this substantial portion of the global and U.S. market would likely result in growth-inducing effects related to the expansion of facilities that supply the raw materials for Solyndra's photovoltaic production processes.

As stated in Chapter 1, Brookhaven National Laboratory has concluded in a recent study that employing photovoltaic energy sources to displace fossil-fuel based energy sources on the electrical grid results in an overall 89 percent reduction in toxic emissions (Fthenakis et al. 2008). It is estimated that the photovoltaic panels produced by the proposed combination of Fab 2 and the Back End facility would, over their lifetimes, offset 245 million metric tons of CO_2.

4.13.3 Cumulative Effects Analysis

The EA analysis identified no incremental adverse cumulative effects on land use, noise, visual resources, or public health and safety from implementing the proposed action. The following cumulative effects were identified:

- Minor long-term adverse cumulative effects on water resources due to the regional increase in impervious surfaces that would be introduced from the proposed project in combination with all identified cumulative projects;
- Minor short-term adverse cumulative effects on water resources due to the soil disturbance and related potential for polluted stormwater to enter waterways from the proposed project in combination with all identified cumulative projects;
- Minor long-term adverse cumulative effects on biological resources due to the regional loss of undeveloped grasslands that potentially serve as habitat for a variety of species due to the proposed project in combination with all identified cumulative projects;
- Minor long-term adverse cumulative effects on traffic levels due to the combined increase in human use of the area as a result of the proposed project in combination with the Bayside Marketplace, Warm Springs Village, and Castilleja projects;
- Minor short-term adverse cumulative effects on air quality due to the soil disturbance and construction activities from the proposed project in combination with all identified cumulative projects;
- Minor long-term adverse cumulative effects on air quality due to the increase in traffic emissions resulting from the proposed

project in combination with the Bayside Marketplace, Warm Springs Village, and Castilleja projects;

- Minor short-term beneficial cumulative effects on socioeconomics from construction job creation from the proposed project in combination with all identified cumulative projects; and
- Minor long-term beneficial cumulative effects on socioeconomics from job creation from the proposed project in combination with the Bayside Marketplace project.

CHAPTER 5
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CHAPTER 6
LIST OF AGENCIES CONTACTED

The following agencies were contacted during the preparation of this EA:

- State Historic Preservation Officer, Office of Historic Preservation, California Department of Parks and Recreation, P.O. Box 942896, Sacramento, CA 94296-0001
- U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Room W-2605, Sacramento, California 95825
- City of Fremont Planning Division, 39550 Liberty Street, Fremont, CA 94538
- California State Clearinghouse, Governor's Office of Planning and Research, P.O. Box 3044, Sacramento, CA 95812-3044
- Native American Heritage Commission, 915 Capitol Mall, Room 364, Sacramento, CA 95814

CHAPTER 7
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APPENDIX A
AGENCY CORRESPONDENCE

CITY OF Fremont

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November 14, 2008

Alan Miyashiro
Solyndra, Inc.
47700 Kato Road
Fremont, CA 94538

RE: PLN2009-00017 SOLYNDRA MANUFACTURING FACILITY EIA

On November 3, 2008, the Zoning Administrator took action to adopt an Environmental Impact Assessment for the above-referenced project subject to conditions and based on findings and testimony received at the Zoning Administrator hearing on November 3, 2008. The adopted Mitigated Negative Declaration and Mitigation Monitoring Plan are available for viewing at the Planning Division office located at 39550 Liberty Street, Fremont, CA 94538.

Decisions of the Zoning Administrator may be appealed to the Planning Commission, pursuant to Fremont Municipal Code Title 8, Chapter 2, Article 30, *Appeals to Council and the Planning Commission.* If you desire information regarding appeal of the action taken by the Zoning Administrator, please contact your project planner, Steve Kowalski at 510-494-4532. Appeals to the Planning Commission must be submitted in writing to the Secretary of the Planning Commission within ten (10) calendar days of the Zoning Administrator action. Any appeal letter must be accompanied by the $50 appeal fee and must set forth: (a) the specific action being appealed; (b) the specific grounds of the appeal; and (c) the relief or action sought from the Planning Commission.

Sincerely,

Barbara Meerjans

Barbara Meerjans
Zoning Administrator
(510) 494-4440

BM:ms

cc: Roger Shanks, Roger Shanks Consulting

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FAX 866.698.4836

October 20, 2008

Mr. Milford Wayne Donaldson
State Historic Preservation Officer
Office of Historic Preservation
California Department of Parks and Recreation
P.O. Box 942896
Sacramento, CA 94296-0001

Subject: Solyndra Photovoltaic Manufacturing Facility, Fremont, CA

Dear Mr. Donaldson:

The Department of Energy is preparing an Environmental Assessment (EA) under the National Environmental Policy Act for guaranteeing a loan to Solyndra, Inc. for the development of a photovoltaic manufacturing facility in Fremont, California. EMPSi is preparing an environmental report for the Department of Energy, for it to consider in preparation of its EA.

Solyndra is proposing to construct a 609,650 square foot photovoltaic (PV) manufacturing facility on a 30 acre vacant portion of a 42.8 acre site located at 4722 Kato Road (Mt. Diablo Meridian T5S, R1W, S25). The project is an infill development in an urban area. The site abuts large lots containing large industrial buildings on either side. The parcels immediately to the north contain warehouse facilities with numerous truck-loading docks, while the abutting parcel to the south is currently under construction as a regional newspaper printing facility.

The City of Fremont is the lead agency under the California Environmental Quality Act for this project and has prepared an Initial Study/Mitigated Negative Declaration (IS/MND). This IS/ND concluded that the project will have no impact on cultural resources. In addition the IS/MND states that City of Fremont "*staff reviewed local inventories and found no known cultural resources or areas likely to contain such resources to exist on or adjacent to the subject property.*" However should any human remains or historical or unique archaeological resources be discovered during grading activities the provisions of CEQA Guidelines, Section 15064.5 (e) and (f) will be followed.

The IS/ND was distributed for a 30-day public review on September 26, 2008.

DENVER, CO

SAN FRANCISCO, CA

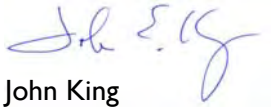
WASHINGTON, DC

www.EMPSi.com

Given the above, we are requesting your concurrence with our determination that the project would have no effect on historic properties affected under 36 CFR Part 800.4(d)(1).

Please contact me at (415) 544-0440 or via email at john.king@empsi.com if you have any questions.

Sincerely,



John King
Principal

Enclosures:
Project location maps (two)
Initial Study/Negative Declaration (two pages)

The project site is located at 47422 Kato Rd in Freemont, California

LEGEND:

○ Project Location

Project Location

The project site is within an industrial area of southern Fremont, near the southeast end of San Francisco Bay.

Project Site Map

47422 Kato Road, Fremont, California

10. **Congestion Management Program - Land Use Analysis:** Any project involving a General Plan Amendment, Notice of Preparation (NOP), or Environmental Impact Report (EIR) must be submitted to the Alameda County Congestion Management Agency (ACCMA).

	YES	X	NO	This project includes a request for a General Plan Amendment. If yes, send appropriate forms to Alameda County Congestion Management Agency.
	YES	X	NO	A Notice of Preparation is being prepared for this project.
	YES	X	NO	An Environmental Impact Report is being prepared for this project.

11. **Other public agencies whose approval is required:** Bay Area Air Quality Management District, Alameda County Water District, Union Sanitary District

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The following list indicates the environmental factors that would potentially be affected by this project. Those factors that are indicated as a "Potentially Significant Impact" in the initial study checklist are labeled "PS" while those factors that are indicated as a "Potentially Significant Unless Mitigation Incorporated" are labeled "M".

	Aesthetics		Agriculture Resources	M	Air Quality
M	Biological Resources		Cultural Resources		Geology / Soils
	Hazards & Hazardous Material		Hydrology / Water Quality		Land Use / Planning
	Mineral Resources	M	Noise		Population / Housing
	Public Services		Recreation		Transportation / Traffic
	Utilities / Service Systems		Mandatory Findings of Significance		

DETERMINATION BY THE CITY OF FREMONT:

On the basis of this initial evaluation:

	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
X	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature: _____ Date: October 1, 2008

Printed Name: Stephen Kowalski For: City of Fremont

Senior Planner Review: _____

ISSUES:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact

d) If a burrow is occupied during the nesting season, impacts shall be avoided by establishing a 250 foot buffer around the burrow where no activity shall occur. The size of the buffer area may be adjusted if a qualified biologist determines it would not be likely to have adverse effects on the burrow. No project activity shall commence within the buffer area until the nesting season has ended, or a qualified biologist confirms that the burrow is no longer occupied or that the young have fledged.

The biological survey did not find any other potential special status habitat on the site. The only trees currently on site are a row of street trees lining the driveway leading to the JC Paper facility at the rear of the site and a row of approximately 20-25 trees located along the front property line adjacent to Kato Road. The trees lining the existing driveway will remain, while the trees along Kato Road will be removed and replaced with new London Plane trees after the berm is re-graded during the creation of the proposed detention basin. For these reasons, no additional mitigation measures for biological resources are necessary. [Sources: 9, 10, D]

V. CULTURAL RESOURCES -- Would the project:

a.	Cause a substantial adverse change in the significance of a historical resource as defined in §15064.57?				X
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?				X
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d.	Disturb any human remains, including those interred outside of formal cemeteries?				X

Comments: Staff reviewed local inventories and found no known cultural resources or areas likely to contain such resources to exist on or adjacent to the subject property. However, very large volumes of grading will be required to provide level building and parking lot surfaces on the site; therefore, should any human remains or historical or unique archaeological resources be discovered during grading activities, the provisions of CEQA Guidelines, Section 15064.5 (e) and (f) will be followed to reduce impacts to a less-than-significant level.

VI. GEOLOGY AND SOILS -- Would the project:

a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	i) 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? Refer to Division of Mines and Geology Special Publication 42.				X
	ii) Strong seismic ground shaking?				X
	iii) Seismic-related ground failure, including liquefaction?			X	
	iv) Landslides?				X
b.	Result in substantial soil erosion or the loss of topsoil?			X	
c.	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 off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	

ENVIRONMENTAL MANAGEMENT AND PLANNING SOLUTIONS, INC.

944 MARKET STREET
SUITE 509
SAN FRANCISCO, CA
94102

PHONE 415.544.0440
FAX 866.698.4836

February 18, 2008

Tristan Tozer, Student Assistant
California Department of Parks and Recreation
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001

Subject: Proposed Solyndra Photovoltaic Manufacturing Facility, 47422 Kato Road, Fremont, California – No Historic Properties Section 106 Consultation

Dear Mr. Tozer:

Thank you for your letter of January 8, 2009 regarding Section 106 consultation for the above project. In response to that letter, I offer this letter providing additional information in support of our original consultation on October 13, 2008. In accordance with 36 CFR Part 800 and Section 106 of the National Historic Preservation Act (NHPA), Environmental Management and Planning Solutions, Inc. (EMPSi) is consulting with you on behalf of the Department of Energy (DOE) regarding the above-referenced project. In summary, the DOE is proposing to guarantee a loan to Solyndra, Inc. for the development of a photovoltaic manufacturing facility at 47422 Kato Road, Fremont, California.

A correction from our initial letter is that the proposed development is only for 30 acres of a larger 42.8-acre parcel. The parcel is within a modern industrial corridor adjacent to Interstate 880. The City of Fremont is the lead agency under the California Environmental Quality Act for this undertaking and has prepared an Initial Study/Mitigated Negative Declaration (IS/MND). As part of the IS/MND effort, the City of Fremont reviewed their records of local cultural resources and archaeologically sensitive areas and found that the project site contained no known cultural resources and was not considered sensitive for such resources; however, a "stop work" order in the event subsurface human remains or archaeological resources are discovered during ground disturbing activities was incorporated into the project.

The following outlines and responds to your office's requests for the additional information and clarifications.

1. "The submitted documentation does not describe the undertaking of the Area of Potential Effects (APE) in sufficient detail. The APE for this undertaking has not been adequately determined and documented pursuant to 36 CFR Part 800.4(a)(1)."

   RESPONSE: The APE for the proposed undertaking includes the proposed 30-acre area within the larger 42.8-acre parcel at 47422 Kato Road, Fremont, California and extends to a maximum depth of 17 feet. This area includes all grading, development, and staging areas. Grading would be concentrated in the

easterly portion of the parcel. Additionally, the APE includes the adjacent Union Pacific Railroad (P-01-001783) which has been recommended as ineligible for the National Register of Historic Places (NRHP) and the California Register of Historical Resources (Krase 1999). The APE is depicted on the attached topographic map.

2. "Nowhere in the submitted documentation does it appear that the DOE has considered the potential presence of subsurface archaeological sites on the subject parcel that may meet the NRHP Criteria for Evaluation."

   RESPONSE: In January 2009 Tetra Tech, Inc. conducted a records search through the Northwest Information Center (NWIC) for the undertaking on behalf of EMPSi (NWIC File No. 08-0835). No resources were identified within the project parcel, however, results showed one resource within a one-mile radius of the project site: P-01-001783. This resource is known as the Union Pacific Railroad (formerly Southern Pacific and Western Pacific Railroads) and parallels adjacent to the eastern boundary of the project parcel. This portion of the railroad is known as the San Jose Branch line, which runs between Niles in the north and San Jose in the south. Recorded by Caltrans in 1999 for the I-880/Mission Blvd. Interchange and Freeway Widening Project, P-01-001783 was evaluated for NRHP and CRHR eligibility and recommended as ineligible (Krase 1999:3). The site record and evaluation of this resource is attached.

   Two previous cultural resource surveys have been conducted within the project site: S-021136 (Busby and Guedon 1996) and S-031176 (Chavez and Krase 2000). The latter survey covered only the western third of the project site, while the former covered the entirety of the project site. Busby and Guedon (1996:5) found that "the majority of the parcel, especially the southeast corner and far northwest corner, has been impacted by ground disturbing activities. Some cutting is evident in the far northeastern [corner] and is probably associated with imported fill in the southeast corner." Additionally, modern debris including "boulder sized" concrete pieces and minor trash and auto part dumping within the southern and eastern portions of the parcel. No cultural resources were identified during the survey or through background research. No subsurface testing or construction monitoring was recommended. Busby and Guedon (1996) is attached.

   Additionally, review of historic maps did not indicate the presence of historic structures or buildings within the project site. (See NWIC 2009, USGS 1899 and 1942, and Haynes 1878.)

3. "The documentation you have provided as evidence of consultation with native American Tribes and organization pursuant to 36 CFR 800.3(f)(2) is incomplete."

   RESPONSE: DOE consulted with the California Native American Heritage Commission (NAHC) in January 2009. The NAHC responded on January 27, 2009 that no sacred sites were identified in their sacred lands file and provided a list of eight Native Americans that may have knowledge of cultural resources in the project area (see attached response letter).

   On February 6, 2009 DOE mailed letters to the recommended Native Americans describing the proposed project and results from the NWIC and NAHC searches and requesting any additional information they might posses regarding cultural resources at the site (see attached example letter). DOE also sent copies of the letters via e-mail to individuals that provided an e-mail address. Responses were requested by March 9, 2009. As of today, no response has been received.

Pursuant to 36 CFR 800.4(d)(1) EMPSi, on behalf of DOE, is seeking from your office a determination of no historic properties affected for the proposed undertaking given that 1) the project site has been surveyed fully within the last nine years; 2) no subsurface investigations were recommended based on that survey; 3) no cultural resources have been identified within the parcel; 4) the surface appears to have been extensively disturbed; and 5) adjacent resource P-01-001783 has been evaluated as NRHP ineligible.

I hope this information clarifies our determination that no historic properties will be affected from this undertaking and that you concur with our conclusions. We look forward to your response within 30 days of the receipt of this letter and would greatly appreciate your response in advance of that time period, if possible.

Please contact me at (415) 544-0440 or john.king@empsi.com if you have any questions.

Sincerely,

John King
Principal

Enclosures:
Regional Location Map
APE Map
NAHC Response Letter
Sample Native American Consultation Letter

References:

Busby, Colin I. and Stuart A. Guedon

1996 Cultural Resources Assessment – APN 519-1005-78, 47550 [?] Kato Road near Safeway, City of Fremont, Alameda County, California. Letter report. Prepared for Lincoln Property Company, Foster City, California. Prepared by Basin Research Associates, Inc., San Leandro, California. September 9, 1996. On file at the Northwest Information Center of the California Historical Resources Information System, Rohnert Park, California. Survey No. S-021136.

Chavez, David and Elizabeth Krase

2000 *Historic Property Survey Report, Route 262/Warren Avenue/I-880 Interchange Reconstruction and I-880 Widening Project*. Prepared by David Chavez and Associates, Mill Valley, California, and Caltrans District 4, Oakland, California. On file at the Northwest Information Center of the California Historical Resources Information System, Rohnert Park, California. Survey No. S-031176.

Krase, Elizabeth

1999 Site Record for CA-ALA-623H (P-01-001783). On file at the Northwest Information Center of the California Historical Resources Information System, Rohnert Park, California.

Northwest Information Center (NWIC)

2009 Records Search Summary Letter for Solyndra Photovoltaic Manufacturing Project, Milpitas 7.5' Quad, Alameda County. On file at the Northwest Information Center of the California Historical Resources Information System, Rohnert Park, California. File No. 08-0835.

Haynes, M.B.

1878 *Map of the County of Alameda.* Drawn by M. B. Haynes, C. E. Published by Thompson & West, Oakland, California. Internet Web site: http://www.davidrumsey.com/maps6577.html. Accessed on April 4, 2008.

United States Geological Survey (USGS)

1899 *San Jose Quadrangle,* 15', 1:62,500. Surveyed 1895. March 1899 Edition. Reprinted 1909.

1942 *San Jose Quadrangle* 15', 1:62,500. Surveyed 1942. 1942 Edition.

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLARA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
1303 Maurice Avenue
Rohnert Park, California 94928-3609
Tel: 707.664.0880 • Fax: 707.664.0890
E-mail: leigh.jordan@sonoma.edu
http://www.sonoma.edu/nwic

MEMO

Date: January 21, 2009 NWIC File No.: 08-0835

To: Erin King

From: Bryan Much

Re: Records Search Summary Letter for Solyndra Photovoltaic Manufacturing Project, Milpitas 7.5' Quad, Alameda County

Milpitas 7.5' QUAD

Resources in project areas: There are no resources located within your project.

Resources within 1 mile radius: There is one resource located in the 1 mile radius of your project areas: P-01-001783, the Southern Pacific Railroad Yard and Tracks. This resource has been mapped and a full copy of the associated records has been included for your reference.

Studies in: There are two studies located within your project area: S-021136 (Busby and Guedon 1996) and S-031176 (Chavez and Krase 2000). In addition, there are two overview reports that cover the broader region, S-009583 (Mayfield 1978) and S-023056 (Basin Research Associates, Inc. 1998). The locations of these studies are mapped on the attached map and the full bibliographic information has been included.

Studies within 1 mile radius: There are thirty-four (34) studies located within the 1 mile radius of your project areas. Please see the attached list for the study numbers of these reports. In addition, the locations of these studies are mapped on the attached map and the full bibliographic information has also been included.

OHP HPD: Copies of the listings for Fremont and its vicinity have been included for your reference.

California Inventory: Copies of the listings for Alameda County have been included for your reference.

Historic Maps: The 1857 Rancho Aqua Caliente plat map depicted no cultural features within your project area or 1 mile radius; therefore, no copies were made. In addition, the portion of the 1942 15-minute San Jose USGS quad depicting your project area has been copied and included for your reference.

STATE OF CALIFORNIA Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

January 27, 2009

John King, Principal
EMPS
944 Market Street, Suite 509
San Francisco, CA 94102

Sent by Fax: 866-698-4836
Number of Pages: 2

Re: Proposed Solyndra Photovoltaic Manufacturing Facility, Alameda County.

Dear Mr. King:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

March 4, 2009

Reply In Reference To: DOE081022A

John King
EMPS Inc.
944 Market Street, Suite 509
San Francisco, CA 94102

RE: Continuing Section 106 Consultation for Proposed Solyndra Photovoltaic Manufacturing Facility, 4722 Kato Road, Fremont, CA

Dear Mr. King:

Thank you for continuing consultation with me pursuant to 36 CFR Part 800, the implementing regulation of Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended. On the behalf of the Department of Energy (DOE), you are seeking my concurrence that the above-mentioned project will not adversely affect historic resources.

As outlined in previous correspondence, Solyndra, Inc. is proposing to construct a 609,650 square foot photovoltaic manufacturing facility on a vacant 30-acre portion of a 42.8-acre site. In support of this undertaking, you submitted for my review and comment two maps and a two-page excerpt of a City of Fremont Planning Document. I determined that your submittal did not meet the documentation standards set forth at 36 CFR § 800.11(b) and requested additional information. You responded in kind, providing me documentation outlining a more detailed Area of Potential Effect (APE), the results of a records search conducted at the Northwest Information Center, and evidence of Native American consultation. Based on my review of this additional information, I have the following comments:

1) I concur that the Area of Potential Effects (APE) has been properly determined and documented pursuant to 36 CFR Parts 800.4 (a)(1) and 800.16 (d) and that the Efforts to Identify Historic Properties within the APE have been appropriate pursuant to 36 CFR Part 800.4.

2) Given the proposed depths (17 feet) of ground disturbing activities for the project, as a caveat to the identification of historic properties within the APE, I would recommend that during any geotechnical explorations the services of a geoarchaeologist or cultural resource specialist with expertise in local prehistoric site formation processes be present to monitor for the potential unearthing of buried cultural deposits. This measure would increase the assurances for providing additional information prior to the onset of project construction activities for the likely presence of buried cultural resources.

3) I further concur that the finding of No Historic Properties Affected is appropriate pursuant to 36 CFR Part 800.4(d)(1) and that the documentation supporting this finding has been provided pursuant to 36 CFR Part 800.11(d).

4) Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, you may have additional future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for considering historic resources during project planning. If you have any questions or comments, please contact Tristan Tozer of my staff at (916) 653-8920 or email at ttozer@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

ENVIRONMENTAL MANAGEMENT AND PLANNING SOLUTIONS, INC.

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DENVER, CO

SAN FRANCISCO, CA

WASHINGTON, DC

www.EMPSi.com

October 20, 2008

Ryan Olah
Coast Bay Delta Branch
Sacramento Fish and Wildlife Office
U.S. Fish and Wildlife Service
2800 Cottage Way Room W-2605
Sacramento, CA 95825

Subject: No Effect Determination for US Department of Energy Loan Guarantee to Solyndra, Inc., Fremont, California

Dear Mr. Olah:

The intent of this letter provides information on our no effect determination for federally listed species resulting from the guarantee of a loan to Solyndra, Inc. by the US Department of Energy.

Proposed Action

The US Department of Energy (DOE) is proposing to guarantee a loan to Solyndra, Inc. (Solyndra) for the development of a photovoltaic manufacturing facility in Fremont, California. With the funds from the loan, Solyndra plans to develop a 30-acre vacant portion of 42.8-acre parcel at 47422 Kato Road, Fremont, California, with a manufacturing plant, offices, and parking facilities.

The project will entail the construction of approximately 350,000 square feet of manufacturing plant floor area and the 64,000 square feet of office space. Construction will include BMPs to control run-off, water quality, air emissions, noise, and other environmental resources.

Project Location

The subject property is located California, Mt. Diablo Meridian T5S, R1W, sec25 in Alameda County within the Milpitas USGS 7 ½ minute quad. It is within an urbanized industrial park. The lot is currently vacant, undeveloped land. Kato Road, which borders the site to the west, is a standard commercial road improved to 36 feet of paved width and acts as a frontage road to Interstate 880 (I-880). The area is sparsely vegetated with invasive and native grass species providing minimal habitat for wildlife.

The parcels immediately to the north contain warehouse facilities with numerous truck-loading docks, while the abutting parcel to the south is currently under construction as a regional newspaper printing facility. A Union Pacific rail line separates the site from smaller industrial parcels to the east. There is an Alameda County Flood Control District open engineered bank flood channel running along the northern property line, and an existing long driveway serving the JC Paper facility runs alongside this channel.

The western border of the site is immediately bordered by Kato Road, and by I-880. The closest wetlands occur approximately 0.70 mile west of the project site and across I-880. Riparian habitat is limited to the area directly adjacent to the Alameda County Flood Control channel.

Status of the Project

An environmental assessment (EA) is being prepared in accordance with the National Environmental Policy Act (NEPA). Under NEPA, the DOE must conform with the requirements outlined in Section 7 of the Endangered Species Act (as well as other laws and regulations) to protect listed species. A species list and letter has been requested and received through the United States Fish and Wildlife Service (USFWS) Sacramento Office's online service. A search of the California Natural Diversity Database (CNDDB) was also performed for the project area to determine the likelihood of species occurrence.

Attached is an account of the species provided by the USFWS (excluding marine and anadramous fish species) and CNDDB search, an assessment of effects and a brief summary of individual species likelihood of occurrence based on literature review and site assessment is also included. Based on the information above and our analysis we have determined that the action will have no effect on threatened or endangered species.

Please contact me at (415) 544-0440 or via email at john.king@empsi.com if you have any questions.

Sincerely,

John King
Principal

Attachments (4):

Project location map
Site map
USFWS Letter confirming species list request
USFWS Species List for Milpitas Quad

References

California Native Plant Society. 2008. Internet Web site: http://www.cnps.org/cnps/rareplants/. Accessed May 21, 2008.

California Natural Diversity Database. 2008. Internet Web site: http://www.dfg.ca.gov/biogeodata/. Accessed May 21, 2008.

US Environmental Protection Agency. 2000. Availability of a Draft Recovery Plan for the Robust Spineflower (*Chorizanthe robusta var. robusta*) from Santa Cruz County, California. FR Vol. 65, No. 182. Sept 19, 2000.

US Fish and Wildlife Service. 2008a. National Wetland Inventory. Internet Web site: http://www.fws.gov/nwi/. Accessed May 21, 2008.

US Fish and Wildlife Service. 2008b. Sacramento Fish and Wildlife Office. Species Account: California Tiger Salamander.

US Fish and Wildlife Service. 2008c. Sacramento Fish and Wildlife Office. Species Account: California Red-Legged Frog.

US Fish and Wildlife Service. 2008d. Sacramento Fish and Wildlife Office. Species Account: California Clapper Rail.

US Fish and Wildlife Service. 2008e. Arcata Fish and Wildlife Office. Species Account: Western Snowy Plover. Internet Web site: http://www.fws.gov/arcata/es/birds/WSP/plover.html. Accessed June 10, 2008.

US Fish and Wildlife Service. 2008f. Sacramento Fish and Wildlife Office. Species Account: Salt Marsh Harvest Mouse.

US Fish and Wildlife Service. 2008g. Sacramento Fish and Wildlife Office. Species Account: Contra Costa Goldfields.

US Fish and Wildlife Service. 2008h. Migratory Bird Management Program. Internet Web site: http://www.fws.gov/migratorybirds/. Accessed May 19, 2008.

US Fish and Wildlife Service. 2008j. Sacramento Fish and Wildlife Office. Species Account: Alameda whip snake.

US Fish and Wildlife Service. 2008k. Sacramento Fish and Wildlife Office. Species Account: San Joaquin kit fox

The project site is located at 47422 Kato Rd in Freemont, California

LEGEND:

○ Project Location

Project Location

The project site is within an industrial area of southern Fremont, near the southeast end of San Francisco Bay.

Project Site Map

47422 Kato Road, Fremont, California

Federally Threatened, Endangered, and Special Status Species with Potential Occurrence in the Project Area

Common Name	Effect Determination	Likelihood of Occurrence	Federal Status
Plants			
Robust spineflower (*Chorizanthe robusta var. robusta)*	No Effect	It is currently known to occur at four sites in California (US Environmental Protection Agency 2000). Populations of the plant are believed to be extirpated from Alameda and Santa Clara Counties (California Natural Diversity Database 2008), suitable habitat is not present on site.	Endangered
Contra Costa goldfields (*Lasthenia conjugens*)	No Effect	Contra Costa goldfields grows in vernal pools within open grassy areas in woodlands and valley grasslands from sea level to 1,500 feet. Currently, 22 populations are believed to be extant in Mendocino, Napa, Marin, Contra Costa, Alameda, Solano, and Monterey Counties (US Fish and Wildlife Service 2008g). There is no suitable habitat within or adjacent to the project.	Endangered
California seablite (*Suaeda californica*)	No Effect	California seablite grows in salt marshes. There is no suitable habitat within or adjacent to the project.	Endangered
Animals			
Conservancy fairy shrimp (*Branchinecta conservation*)	No Effect	The USFWS lists eight (8) known locations of the shrimp, none of them are close to the project area and no suitable habitat exists nearby.	Endangered
Bay checkerspot butterfly *(Euphydryas editha bayensis)*	No Effect	The butterfly relies on plants that live in serpentine derived or similar soils. This habitat does not exist in the project area or nearby.	Threatened
Vernal pool tadpole shrimp (*Lepidurus packardi*)	No Effect	The vernal pool tadpole shrimp has a patchy distribution, with isolated occurrences in Alameda and Contra Costa Counties. Critical habitat for the tadpole shrimp is designated and exists approximately two miles northeast from the project site in the Don Edwards National Wildlife Refuge. Suitable habitat can not be found on the site.	Endangered
California tiger salamander (*Ambystoma californiense*)	No Effect	The site is dry and without standing water for breeding in close proximity. Suitable habitat for California tiger salamander does not exist at the proposed project site, nor can it be found nearby in the developed areas surrounding the proposed project area.	Threatened
California red-legged frog (*Rana aurora draytonii*)	No Effect	The California red-legged frog occupies a fairly distinct habitat, combining both	Threatened

		specific aquatic and riparian components. Adults need dense, shrubby, or emergent riparian vegetation closely associated with deep (greater than 2 1/3 feet deep) still or slow moving water. Suitable habitat for California red-legged frog is not found at or near the proposed site, and the frog is not expected to occur in this area.	
Alameda whipsnake (*Masticophis lateralis euryxanthus*)	No Effect	Alameda whipsnakes are typically found in chaparral—northern coastal sage scrub and coastal sage. Recent telemetry data indicate that, although home ranges of Alameda whipsnakes are centered on shrub communities, they venture up to 500 feet into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland (US Fish and Wildlife Service 2008j). The closest suitable habitat for the snake is found approximately two miles from the site, on the eastern side of Interstate 680 in the Mission Peak foothills.	Threatened
California clapper rail (*Rallus longirostris obsoletus*)	No Effect	Suitable habitat for the California clapper rail can be found approximately one mile west of the project, across I-880 in the marshes of the San Francisco Bay. No suitable habitat for nesting or foraging exists at the project site, and any occurrence of the bird would be a result of infrequent migrations through the area.	Endangered
Western snowy plover (*Chradrius alexandrinus nivosus*)	No Effect	Only marginal habitat exists in the tidal marshes west of the project site, and the high level of human disturbance near those areas makes them generally unsuitable for breeding or nesting. The plover is not expected to occur, except as a possible infrequent migratory transient.	Threatened
Western burrowing owl (Athene cunicularia)	May Effect, Not likely to adversely affect	Ground squirrels burrows are present on the eastern side of the project site and may provide habitat for burrowing owl. Mitigation is provided as part of the project to ensure no adverse impact will occur.	Concern
Salt-marsh harvest mouse (*Reithrodontomys raviventris*)	No Effect	There is no suitable habitat for the mouse in the project area, and none are expected in the marshes across Interstate 880.	Endangered
San Joaquin kit fox (*Vulpes macrotis mutica*)	No Effect	No records exist for the fox in the project area (CNDDB 2008), and no suitable habitat exists nearby.	Endangered

Source: US Fish and Wildlife Service 2008, California Natural Diversity Database 2008; California Native Plant Society 2008

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

September 12, 2008

Document Number: 080912021530

Ty Brookhart
EMPSi
944 Market St.
Ste 509
San Francisco, CA 94102

Subject: Species List for DOE Loan Guarantee Program for Solyndra PV Facility

Dear: Mr. Brookhart

We are sending this official species list in response to your September 12, 2008 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area*. For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be December 11, 2008.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 080912021530

Database Last Updated: January 31, 2008

Quad Lists

Listed Species

Invertebrates

Branchinecta conservatio
Conservancy fairy shrimp (E)

Euphydryas editha bayensis
bay checkerspot butterfly (T)

Lepidurus packardi
Critical habitat, vernal pool tadpole shrimp (X)
vernal pool tadpole shrimp (E)

Fish

Hypomesus transpacificus
delta smelt (T)

Oncorhynchus mykiss
Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (NMFS)

Oncorhynchus tshawytscha
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense
California tiger salamander, central population (T)

Rana aurora draytonii
California red-legged frog (T)

Reptiles

Masticophis lateralis euryxanthus
Alameda whipsnake [=striped racer] (T)

Birds

Charadrius alexandrinus nivosus
western snowy plover (T)

Rallus longirostris obsoletus
California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni
California least tern (E)

Mammals

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Vulpes macrotis mutica
San Joaquin kit fox (E)

Plants

Lasthenia conjugens

Contra Costa goldfields (E)
Critical habitat, Contra Costa goldfields (X)

Suaeda californica
California sea blite (E)

Quads Containing Listed, Proposed or Candidate Species:

MILPITAS (427B)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.
(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.
(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.
Critical Habitat - Area essential to the conservation of a species.
(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
(C) *Candidate* - Candidate to become a proposed species.
(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.
(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Plant Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental

documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies and organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be December 11, 2008.