

## ***Decommissioning Plan***

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Fleshman/Kost Road 3 MW Solar Farm  
9690 Kost Road, Galt, California

April 26, 2011  
Project Number 1101-0001

Prepared for  
**Sacramento County Department of  
Planning and Community Development**  
Sacramento, California

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**1.0 PROJECT DESCRIPTION**

A 3 megawatt (MW) photovoltaic (PV) solar farm is proposed at 9690 Kost Road on approximately 20 acres of an approximately 68-acre property with a General Plan designation as General Agriculture and a zoning designation as Ag-20. The generation of electricity and interconnection to existing 12.47kV electrical distribution lines at this location has been accepted by Sacramento Municipal Utility District (SMUD). Figure 1 shows the proposed site plan.

The solar farm consists of a ground mounted solar array; the solar panels are mounted on a simple fixed-tilt, post, rail, and cross beam structure. The vertical steel posts are set in concrete footings. The panels are low glare and will be tilted in a southwestern direction, towards Dry Creek. The low end of the panels is approximately two feet above the ground; the top or high end of the panels is approximately ten feet off the ground. The entire project will be surrounded by a six-foot chain-link fence topped with three-strand barbed wire. The solar array will be connected to inverters, which are current conversion equipment and switches. The electric power from the inverters will be run via underground to electric utility interconnect equipment at the edge of the arrays, and from that to the electricity distribution line (i.e. grid). Native or seeded grass will be utilized for ground cover within the project boundaries.



**Picture of a solar power plant**

The Project has an estimated useful lifetime of 30 years or more, with an opportunity for a lifetime of 50 years or more with equipment replacement and repowering. This section of the document, however, assumes that at the end of the 20 year power generation contract with SMUD the system will be completely dismantled and the site restored to its preconstruction state.

**1.1 PROCEDURES FOR DECOMMISSIONING AFTER CEASING OPERATION**

The Project consists of numerous recyclable materials, including glass, semiconductor material, steel, wood, aluminum, copper, and plastics. When the Project reaches the end of its operational life, the component parts can be dismantled and recycled. The Project components will be dismantled and removed using minimal impact conventional construction equipment and recycled or disposed of safely.

### **1.1.1 Temporary Erosion Control**

Appropriate temporary (construction-related) erosion and sedimentation control best management practices (BMP) will be used during the decommissioning phase of the project. The BMPs will be inspected on a regular basis to ensure their function.

### **1.1.2 General Removal Process**

Effectively, the decommissioning of the solar plant proceeds in reverse order of the installation.

1. The PV facility shall be disconnected from the utility power grid.
2. PV modules, from First Solar, shall be disconnected, collected and returned per the First Solar Collection and Recycling Program (see description below and Appendix A)
3. Site aboveground and underground electrical interconnection and distribution cables shall be removed and recycled off-site by an approved recycling facility.
4. PV module support wooden beams and aluminum racking shall be removed and recycled off-site by an approved recycler.
5. PV module support steel and support posts shall be removed and recycled off-site by an approved metals recycler.
6. Electrical and electronic devices, including transformers and inverters shall be removed and recycled off-site by an approved recycler.
7. Concrete foundations shall be removed and recycled off-site by a concrete recycler.
8. Fencing shall be removed and will be recycled off-site by an approved recycler.
9. The only roads constructed for the project site will be the interior perimeter fire break road to be constructed of a minimum 4" aggregate base. The interior roads can remain onsite should the landowner choose to retain them, or be removed and the gravel repurposed either on- or off-site.
10. The Project Site may be converted to other uses in accordance with applicable land use regulations in effect at that time of decommissioning. There are no permanent changes to the site and it can be restored to its original condition including re-vegetation. Any soil removed for construction purposes will be relocated on the site or used for landscaping after construction is complete.

### **1.1.3 PV Module Collection and Recycling**

The project will use First Solar PV modules; these products are sold with an inherent unconditional, prefunded Collection and Recycling Program (brochure attached as Appendix A). To take advantage of this program, the modules will be electrically and mechanically disconnected from the solar array and packaged for shipment per First Solar's requirements. First Solar arranges for the transportation and recycling of the modules from the site. The module recycling program includes the glass and the encapsulated semiconductor material, with over 90% of the material recovered for future use.

#### **1.1.4 Electrical Wiring Removal and Recycling**

The electrical wiring is typically installed underground (limited amount) or is attached to the wooden beams (majority) on the module racking structure. To remove the underground wire, the original trenches in which the wire is buried will be dug up and the conduit and wire removed. The wire attached to the wooden rail is primarily attached via plastic clip and can be removed by hand. The wiring is either copper or aluminum (depending on the function/location) encapsulated in an insulating plastic material; most of these materials are desirable commodities that can be recycled.

#### **1.1.5 Racking Structure Removal and Recycling**

The racking structure consists of aluminum racking rails, wooden cross beams, and steel posts. All of these materials can be recycled and/or reused. Removal of the aluminum racking and wooden beams is straightforward, as the primary attachment is via screws, clips, nuts, and bolts. The steel posts are secured by small concrete foundations and will be removed using heavy equipment. An appropriate recycler can reuse these materials.

### **1.2 PROCEDURES FOR DECOMMISSIONING DURING CONSTRUCTION (ABANDONMENT OF PROJECT)**

In case of abandonment of project during construction, the same decommissioning procedures as for Decommissioning after Ceasing Operation will be undertaken and the same decommissioning and restoration program will be honored, in as far as construction proceeded before abandonment. The facility will be dismantled, materials removed and recycled, the soil that was removed will be graded and the site returned to its preconstruction state.

## **2.0 FINANCIAL GUARANTEES**

The proposed solar power project is comprised of several levels of contracts that are in place to ensure performance during the operational life; therefore it is a very secure investment with significant residual value.

1. Secured revenue stream: Each project has a PPA with SMUD that guarantees a fixed rate payment for the power generated during a 20 year term. SMUD's A+ credit rating backs the PPA and assures that power payments will reliably be made to cover operating costs and the initial investment. In contrast to most businesses that the County permits, the solar facility is not selling into an open market, but rather has a fixed revenue stream for 20 years – an assurance that should give the County great comfort around the operations of the facility.
2. Operational Security: Solar modules are the primary component to the solar facility and represent approximately half of the overall project cost. The First Solar module used for the proposed project carries with it a 25-year performance warranty. In the event a module breaks down, the manufacturer provides a replacement module at no cost to the facility owner. Solar fuel is free and low operational costs provide few opportunities for mismanagement or project failure.
3. Performance Incentives: Because SMUD is paying only for kilowatt hours produced, key facets of the development include selection of high quality equipment, investment in system design, and management the facility to run it optimally for the duration of the term and life of the facility. Bank financing of initial project costs will ensure deep scrutiny of selected equipment and operational

contracts to protect their investments. Following the financial complications of the last few years, banks are more conservative and require deeper diligence than ever before.

4. Security against company performance: Should the project owners fail to operate the facility successfully, the financiers, as long-term investors in the project, will step in to take over the facility and run the project for the life of the PPA.
5. High residual value: At the conclusion of the 20 year PPA contract term, the facility will have an additional 10 – 15 years of operational life, free of encumbrances and can operate at an extremely low cost, thus creating a high residual value of the facility. The equipment will no longer be cutting edge, but its production of kilowatt hours will always have value and the equipment's performance will be guaranteed by an industry standard solar module warranty to be approximately 80% of its original production. The owner will either establish another long-term PPA contract or sell high value peak production into the spot market. If the facility cannot remain on the same parcel of land, the expected value of the kilowatt hours the facility can produce between years 21 and 35 is worth roughly 30 times the cost to remove and relocate the facility to another market where there is a buyer for the power, making the removal of the system a sound economic decision for the owner.
6. Salvage value: At the end of the useful life of the solar modules, after 35 years, the facility value will be reduced to that of the commodity materials it's constructed of – steel, copper, aluminum, and wood.

With these facts in mind, and in line with the requirements from other counties, the following surety is proposed:

Decommissioning Trust: As part of the financing of the project, the project owner will establish a series of Trusts to be managed by a third party financial institution determined by the project financiers. It has been confirmed that payments from the PPA can be routed directly to fund the Trusts. One of the Trusts that will be established at financing will be a Decommissioning Trust, which will be funded directly by payments from SMUD two years prior to expiration of the PPA contract. Automatic routing of SMUD payments into the Decommissioning Trust by a third party financial institution alleviates the County of any burden associated with notifying the project owner that decommissioning payments are due. At the beginning of year eleven (11) of the PPA term, 10 percent (10%) of the estimated decommissioning cost shall be deposited into the Decommissioning Trust. For each of the nine (9) subsequent years, 10% per year will be deposited into the Decommissioning Trust, bringing the total to 100% of the estimated decommissioning costs.

- a) If a PPA contract is renewed, extended, or a new PPA is contracted, then the Trust will return the funds to the project owner, so long as the new contract has a mechanism to route a percentage of the decommissioning costs to the Trust in the years prior to the termination of the new contract such that an equal yearly amount will be contributed to the Trust to fully fund the Trust during the last 10 years of the new contract.

- b) Both the County and the land owners have an interest in decommissioning the facility, should it be abandoned. The proposed Decommissioning Trust would likely function as a construction fund, which pays for decommissioning costs incurred, upon completion. The land owner and County could be given sequential terms in which to activate the construction fund. The terms and conditions under which the funds would be released are explicitly to be negotiated.
- c) Given that the financial assurances being requested amount to a pre-funded repossession of private property, the conditions and terms under which the decommissioning security can be drawn on will need to be explicitly defined through negotiations.

The value of the Trust shall be based on the net cost of executing the Decommissioning Plan. Table 1 below illustrates the estimated cost per MW for removing a solar power plant offset by the value that will immediately be recovered from recycled scrap materials.

**3MW project decommissioning cost**

Component	Disposal Costs	Labor Costs	Value of Recycled Materials	Net cost	Note
Fence	\$20,000	\$30,000	\$10,000	\$40,000	
AC and DC electric wiring	\$15,000	\$120,000	\$90,000	\$45,000	Entirely reusable copper/aluminum wire; assumes market value of scrap Cu from LME
Transformer + Switchgear	\$30,000	\$15,000	\$75,000	-\$30,000	Lifetime of transformer and switchgear >> 20 years; significant reclamation value
PV-Module	\$0	\$90,000	\$0	\$90,000	Cost of solar module removal labor = similar to cost of installation
Aluminum Module Support	\$5,000	\$30,000	\$150,000	-\$115,000	Commodity price for scrap aluminum from LME
Wooden Beams	\$0	\$30,000	\$0	\$30,000	Wood can be scrapped or buried
Steel posts	\$0	\$60,000	\$50,000	\$10,000	Concrete removal offset by recovery of steel at scrap commodity price from LME
Concrete and residual waste	\$75,000	\$75,000	\$0	\$150,000	
<b>Net sum</b>				<b>\$220,000.00</b>	

**Table 1: Net cost of decommissioning**

Notes on Table 1

- 1) Disposal costs estimated based on transport plus disposal fee
- 2) Labor costs based on discounted installation costs (disassembly requires more unskilled labor)
- 3) Value of recycled materials based on commodity scrap prices from London Metals Exchange



Prepared by:

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Vivek Phanse  
Director, Business Development



Approved by:

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Dave Taggart  
President

April 26, 2011

**Figures**

**GENERAL NOTES:**  
 LOCATION: APPROXIMATELY 22.8-ACRE AREA OF A 68.1-ACRE PARCEL LOCATED WEST OF HIGHWAY 99 AND ON THE SOUTH SIDE OF KOST ROAD IN UNINCORPORATED SACRAMENTO COUNTY (NEAR GALT), CALIFORNIA. APN: 148-0200-002.

EXISTING SITE CONDITION PER TOPOGRAPHIC SURVEY PERFORMED BY CONTI & ASSOCIATES INC, DATED 04/15/10.

**PROJECT NOTES:**  
 SYSTEM CONSISTS OF 3 STATIONARY FIXED-TILT GROUND-MOUNTED THIN FILM PHOTOVOLTAIC SYSTEM BLOCKS.

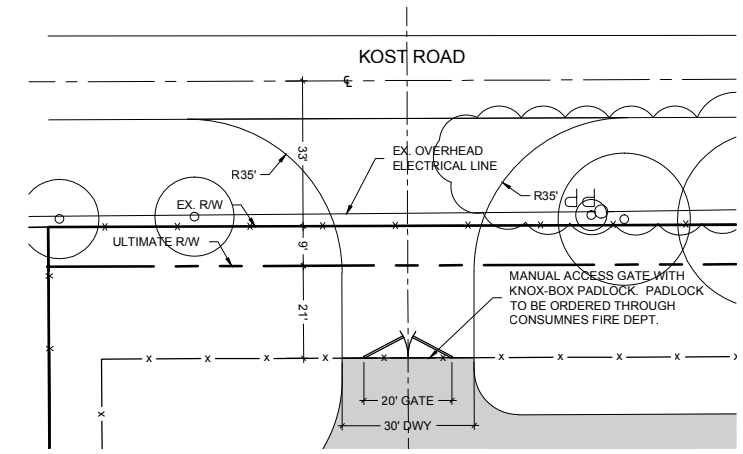
13 PV MODULES ARE CONNECTED IN SERIES TO FORM A SOURCE CIRCUIT.

EACH 1 MW SYSTEM BLOCK CONSISTS OF THE FOLLOWING:  
 117 - SUBARRAYS  
 1,170 - SOURCE CIRCUITS  
 15,210 - FS-380 PV MODULES  
 1 - SATCON 1 MW INVERTER  
 1,216.8 - KW DC STC  
 1,000.0 - KW AC

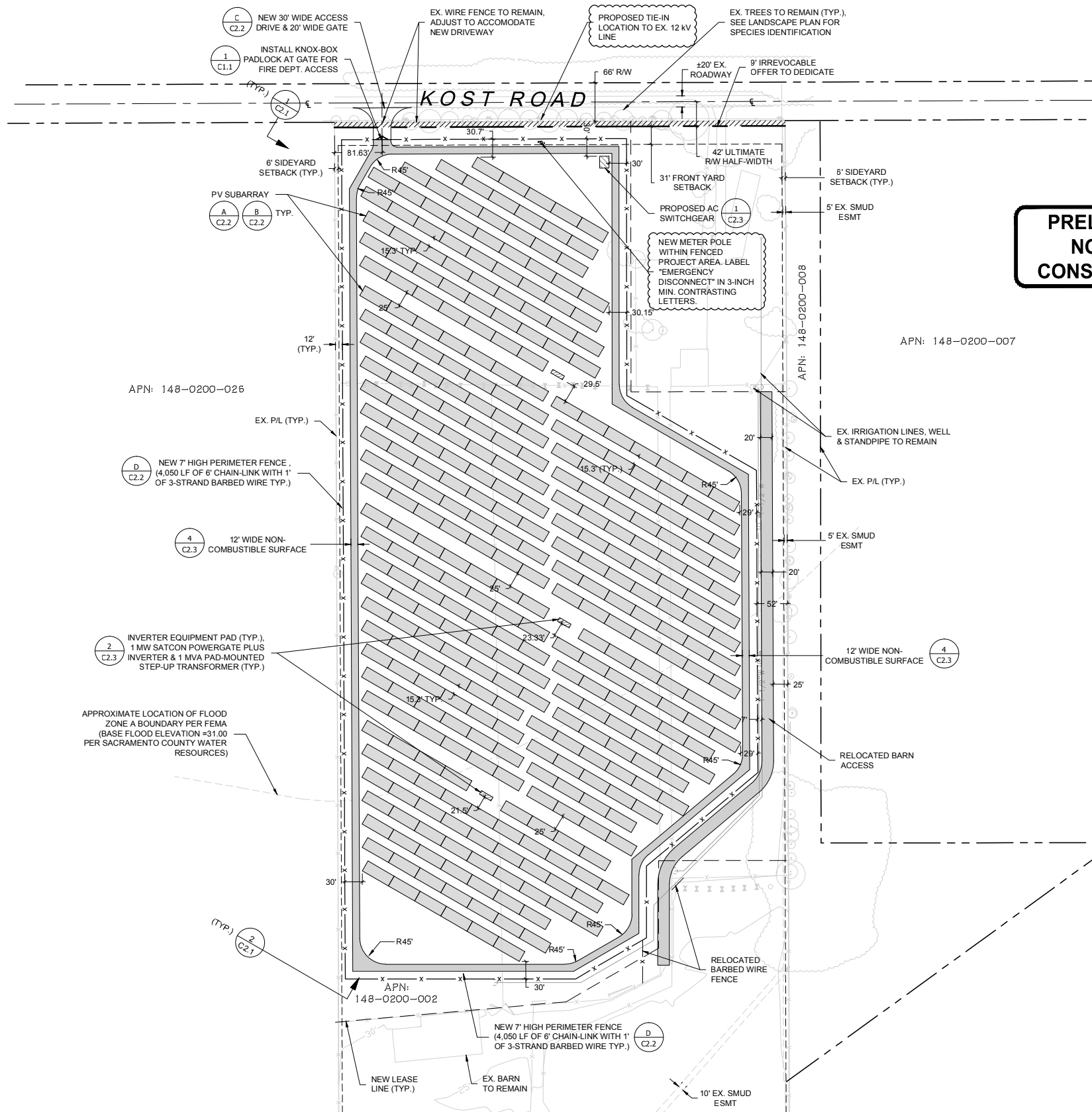
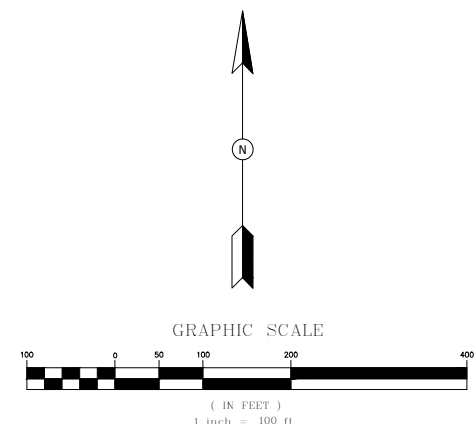
**LEGEND:**

- PV SUB-ARRAY
- INVERTER/TRANSFORMER PAD
- FENCE
- EX. PROPERTY LINE
- NEW PROPERTY LINE
- CENTER LINE
- EX. EASEMENT

**PRELIMINARY  
NOT FOR  
CONSTRUCTION**



1 DRIVEWAY & ACCESS GATE DETAIL  
 Scale: 1"=20'



- C2.2 NEW 30' WIDE ACCESS DRIVE & 20' WIDE GATE
- C1.1 INSTALL KNOX-BOX PADLOCK AT GATE FOR FIRE DEPT. ACCESS
- EX. WIRE FENCE TO REMAIN, ADJUST TO ACCOMMODATE NEW DRIVEWAY
- PROPOSED TIE-IN LOCATION TO EX. 12 KV LINE
- EX. TREES TO REMAIN (TYP.), SEE LANDSCAPE PLAN FOR SPECIES IDENTIFICATION
- ±20' EX. ROADWAY
- 9' IRREVOCABLE OFFER TO DEDICATE
- 66' RW
- 42' ULTIMATE RW HALF-WIDTH
- 31' FRONT YARD SETBACK
- 8' SIDEYARD SETBACK (TYP.)
- 5' EX. SMUD ESMT
- 8' SIDEYARD SETBACK (TYP.)
- PV SUBARRAY TYP. A, B, C2.2
- PROPOSED AC SWITCHGEAR C2.3
- NEW METER POLE WITHIN FENCED PROJECT AREA. LABEL "EMERGENCY DISCONNECT" IN 3-INCH MIN. CONTRASTING LETTERS.
- 12' (TYP.)
- EX. P/L (TYP.)
- APN: 148-0200-026
- EX. IRRIGATION LINES, WELL & STANDPIPE TO REMAIN
- EX. P/L (TYP.)
- EX. SMUD ESMT
- NEW 7' HIGH PERIMETER FENCE, 4,050 LF OF 6' CHAIN-LINK WITH 1" OF 3-STRAND BARBED WIRE TYP. D C2.2
- 12' WIDE NON-COMBUSTIBLE SURFACE C2.3
- EX. SMUD ESMT
- 12' WIDE NON-COMBUSTIBLE SURFACE C2.3
- INVERTER EQUIPMENT PAD (TYP.), 1 MW SATCON POWERGATE PLUS INVERTER & 1 MVA PAD-MOUNTED STEP-UP TRANSFORMER (TYP.) C2.3
- APPROXIMATE LOCATION OF FLOOD ZONE A BOUNDARY PER FEMA (BASE FLOOD ELEVATION =31.00 PER SACRAMENTO COUNTY WATER RESOURCES)
- RELOCATED BARN ACCESS
- RELOCATED BARBED WIRE FENCE
- RELOCATED BARBED WIRE FENCE
- NEW LEASE LINE (TYP.)
- EX. BARN TO REMAIN
- 10' EX. SMUD ESMT
- APN: 148-0200-002
- NEW 7' HIGH PERIMETER FENCE (4,050 LF OF 6' CHAIN-LINK WITH 1" OF 3-STRAND BARBED WIRE TYP.) D C2.2

PLOTED: 5/17/2011 2:33:31 PM  
 PATH: \\sac-fle3\proj\1101-0001\_FLESHMAN\Drawings\1101-0001\_C11\_SMUD-110317.dwg

REV	DATE	DESCRIPTION	DATE:
			ISSUE:
			DRAWN BY / DATE:
			CHECK BY / DATE:
			CAD DWG FILE:

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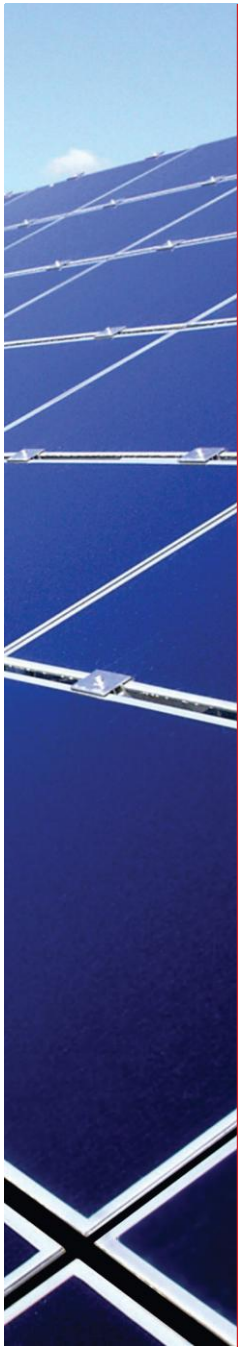
8076 Central Avenue  
 Newark, CA 94560  
 510.896.3940

FLESHMAN 3 MW PV POWER PLANT	DRAWING NO. <b>C1.1</b>
<b>SITE PLAN</b>	PROJECT NO. 1101-0001
9690 KOST ROAD, GALT, CA	



## **APPENDIX A**

### **FIRST SOLAR COLLECTION AND RECYCLING PROGRAM**



## Summary: Module Collection and Recycling Program

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First Solar certifies that all modules produced and sold by First Solar are covered by First Solar's Module Collection and Recycling Program. Under this program, First Solar provides packaging materials, transportation, and recycling services at no additional cost.

Consistent with the philosophy of extended producer responsibility, First Solar's Module Collection and Recycling Program meets the following conditions:

- **Free:** At the time of module sale, First Solar sets aside sufficient funds in custodial accounts to meet the estimated future collection and recycling costs of modules at the end of their useful life. The only requirement for those wishing to dispose of First Solar modules is to dismantle and package the modules in accordance with First Solar's instructions.
- **Unconditional:** First Solar places no restrictions on when someone may request collection. At any time, anyone in possession of a First Solar module can request collection via:
  - the Web: [www.firstsolar.com/recycling](http://www.firstsolar.com/recycling)
  - email: [recycling@firstsolar.com](mailto:recycling@firstsolar.com)
  - telephone:  
1.866.456.8938 (North American Toll Free)  
+800.433.32.333\* (International Freephone)  
\*For more details on dialing codes please visit First Solar's website.
- **Protected against insolvency:** First Solar has established a trust structure to protect funds in the custodial accounts from the potential insolvency of First Solar. Only the Trustee can distribute funds from the custodial accounts for the purpose of administering module collection and recycling, either by First Solar or a third party executing the collection and recycling services.

A summary of the financing arrangements for First Solar's Module Collection and Recycling Program is attached.

First Solar's Module Collection and Recycling Program, including the financing arrangement, is audited periodically by an independent third-party auditor.

**Should you have any questions regarding First Solar's Module Collection and Recycling Program, please contact First Solar at [recycling@firstsolar.com](mailto:recycling@firstsolar.com) or:**

Attn: Customer Service  
First Solar GmbH  
Rheinstrasse 4B  
D-55116 Mainz, Germany  
Tel: +800.433.32.333  
Fax: +49.6131.1443.50

Attn: Customer Service  
First Solar, Inc.  
PO Box 730  
Toledo, OH 43697, USA  
Tel: 1.866.456.8938  
Fax: 1.419.662.8525



**Summary of Terms**

**SUMMARY OF TERMS  
FIRST SOLAR MODULE COLLECTION AND  
RECYCLING AGREEMENT**

**Agreement Description:** Module Collection and Recycling Agreement (the "Agreement")

**Parties:** First Solar, Inc., First Solar Manufacturing GmbH, and First Solar Malaysia Sdn. Bhd. (collectively, "First Solar")

J. P. Morgan Investment Management, Inc., as the Investment Advisor (the "Investment Advisor")

U.S. Bank Trust National Association, as Trustee (the "Trustee") of the First Solar Recycling Payment Trust, a Delaware statutory trust (the "Trust")

**Term of Agreement:** Ninety-nine years, unless commuted earlier as described below.

Under the Agreement, First Solar has agreed to fund an amount into the Trust for solar modules sold by it on or after January 1, 2003 in an amount estimated to cover the estimated future costs of module collection and recycling. First Solar may adjust the amount funded per module sold by notice to the Trustee and the Investment Advisor to accommodate changes in estimated collection and recycling costs. The funds contributed by First Solar will be invested by the Investment Advisor under an Investment Management Agreement and are intended to be available only to pay the estimated costs of collection and recycling with respect to solar modules sold by First Solar.

As solar modules sold by First Solar reach the end of their product life and are requested to be collected for recycling, the Trust will distribute quarterly to First Solar (or an alternate entity designed to provide collection and recycling services) a sum equal to the product of the number of solar modules collected in such quarter, times the estimated cost of collection and recycling of such modules, subject to availability of funds in the Trust to make such payments.

The Agreement is subject to commutation by First Solar (a) in the event that it elects to replace the Investment Management Agreement with the Investment Advisor with another investment agreement intended to provide the same or better support for its collection and recycling efforts, (b) in the event the Investment Management Agreement with the Investment Advisor is terminated, in which case the Trustee shall transfer all Trust Funds to an interest-bearing deposit account, held in the name of the Trust, at a lending institution insured by the U.S. Federal Deposit Insurance Corporation and whose long term debt is rated "A2" or higher by Moody's and "A" or higher by Standard & Poor's, or (c) in the event First Solar elects to participate in an established industry-wide collection and recycling program and transfers the funds in the Trust in accordance with the guidelines established under such program.

This summary of terms is issued on behalf of First Solar as a matter of information only and confers no legal rights to you as the summary holder. Notwithstanding any requirement, term or condition of any contract or other document with respect to which this summary may be issued or may pertain, the Agreement is subject to all terms, exclusions and conditions of such Agreement. This summary does not amend, extend or alter the coverage provided by the Agreement.



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J. P. Morgan Investment Management Inc.

**Michael Hurst**  
**Vice President**