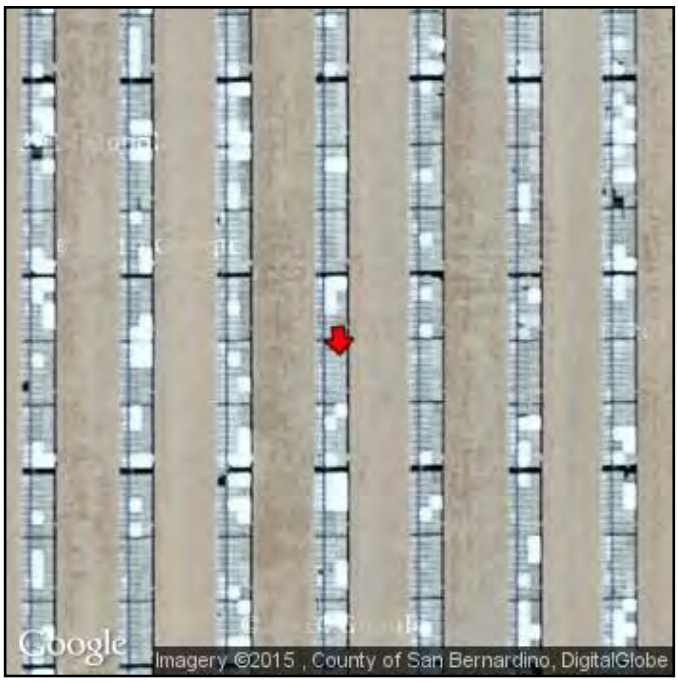
Photo ID: 49

Attributes	
Comments	North side of west SEGS 2
Photo ID	49

Photo ID: 50



Attributes	
Comments	SEGS 2 west at soil vapor test location SV-3
Photo ID	50

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Attributes	
Comments	SEGS 2 west at soil boring location P-9
Photo ID	51

Photo ID: 52

Attributes	
Comments	Therminol spill at 37B double flex hose. Darker wet looking areas is where there is still some stringers of therminol that needs to be excavated.
Photo ID	52

Photo ID: 53

Attributes	
Comments	Double flex hose in therminol array
Photo ID	53

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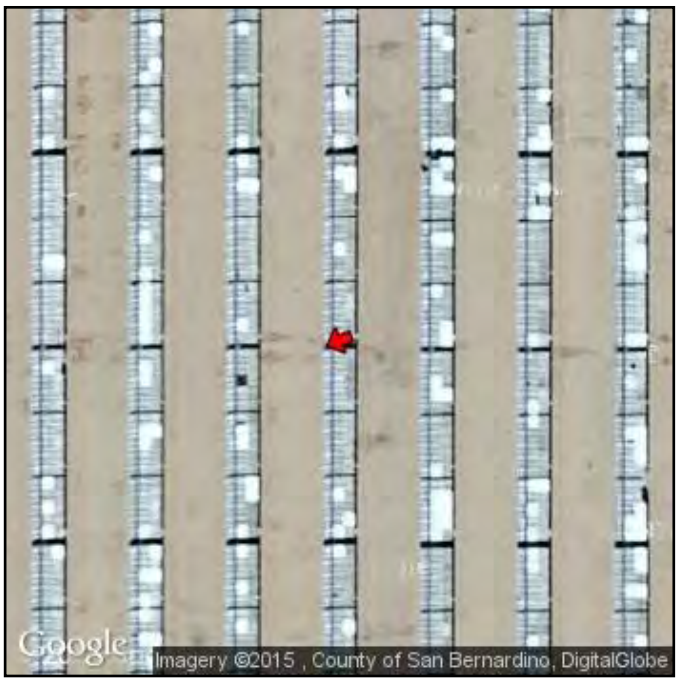

Attributes	
Comments	Former remediaton area at 27H in west SEGS 2 array field. Boring P-11 is located in this area.
Photo ID	54

Photo ID: 55

Attributes	
Comments	View of east SEGS 2 array field between rows 17 and 18. Boring P-12 is located in this area.
Photo ID	55

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Attributes	
Comments	Therminol stockpile ready to be put in treatment area. Boring P-13 is located along the site periminter in this area.
Photo ID	56

Photo ID: 57

Attributes	
Comments	Machine shop and storage conex near soil boring S-11
Photo ID	57

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Attributes	
Comments	Used oil AST at SEGS 2 Powerblock. There is a large containment area. No leaks or spills observed.
Photo ID	58

Photo ID: 59

Attributes	
Comments	View of SEGS 2 powerblock near soil boring S-10
Photo ID	59

Photo ID: 60

Attributes	
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Photo ID	60

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Attributes	
Comments	At soil boring S-7 in SEGS 2. Acid tanks and independent superheat.
Photo ID	61

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Attributes	
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Attributes	
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Photo ID	63

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Attributes	
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Photo ID: 65

Attributes	
Comments	East well at cooling tower for SEGS 2
Photo ID	65

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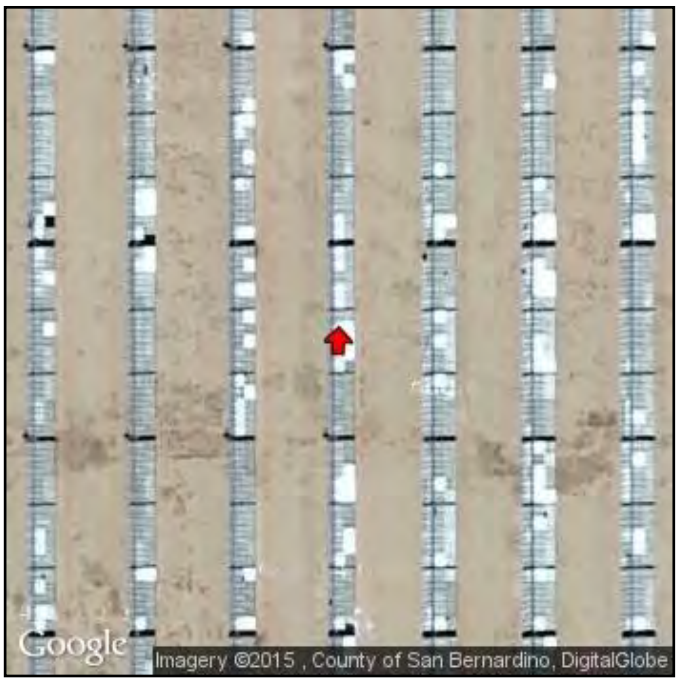
Attributes	
Comments	Land treatment unit (LTU) area 2 for therminol contaminated soils
Photo ID	66

Photo ID: 67

Attributes	
Comments	View of SEGS 2 powerblock and east solar field on right
Photo ID	67

Photo ID: 68



Attributes	
Comments	Location of soil vapor probe SV-6 in east SEGS 2 array feld
Photo ID	68

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Comments	View of SEGS 2 east between rows 26/27 near soil boring P-14
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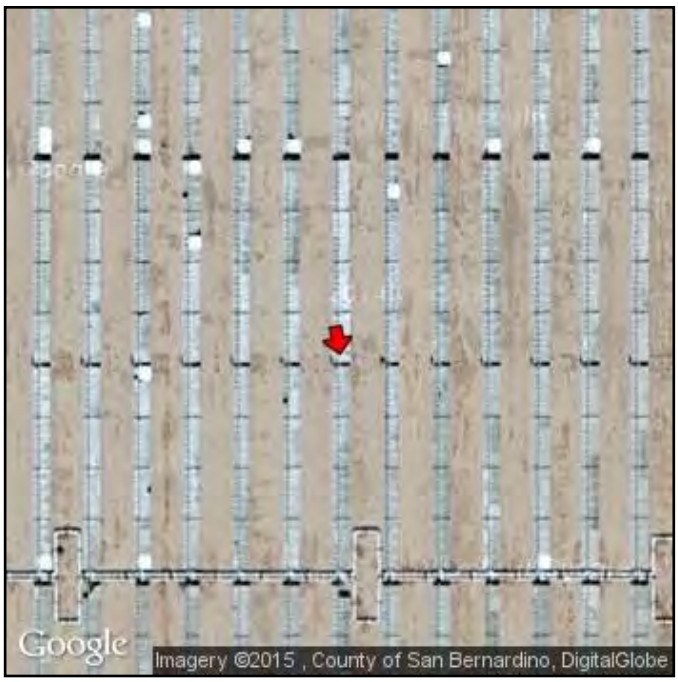
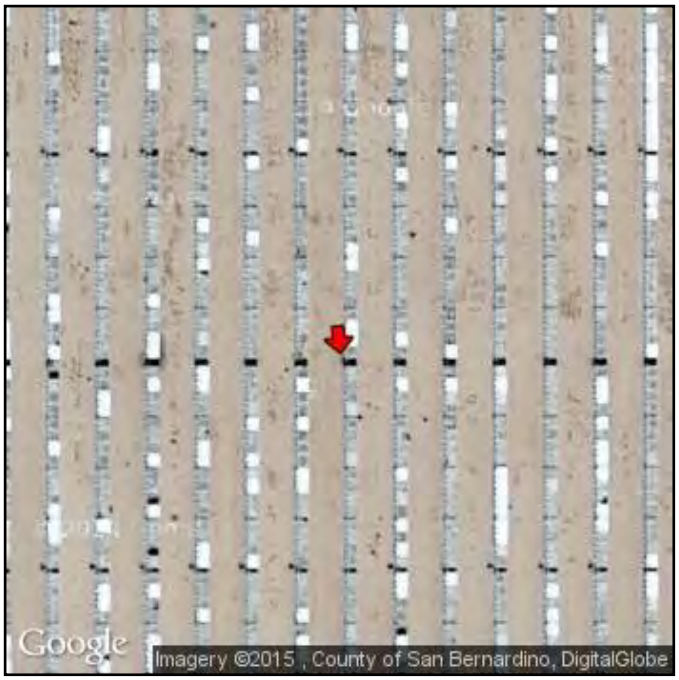
Attributes	
Comments	At soil boring P-15 in SEGS 2 south field
Photo ID	70

Photo ID: 71



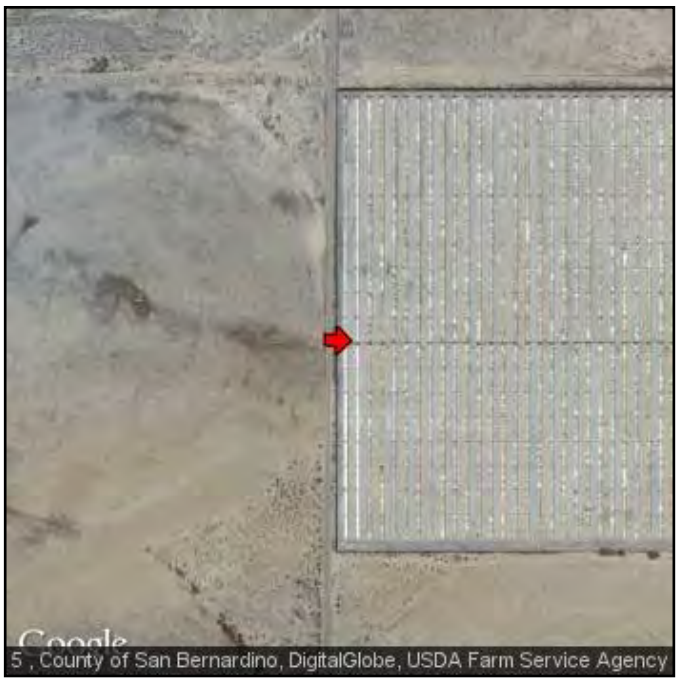
Attributes	
Comments	At soil vapor sampling point SV-5 in south SEGS 2 solar field
Photo ID	71

Photo ID: 72



Attributes	
Comments	North SEGS 2 array at 66T old therminol spill remediated.
Photo ID	72

Photo ID: 73



Attributes	
Comments	At boring P-10 and a view of new spill area at row 41E/F south single flex along header
Photo ID	73

Photo ID: 74

Attributes	
Comments	Multiple therminal deminimus spill area at 41 E/F , east array SEGS 2 field.
Photo ID	74

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Attributes	
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Photo ID	75

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Photo ID	77

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Attributes	
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Photo ID	78

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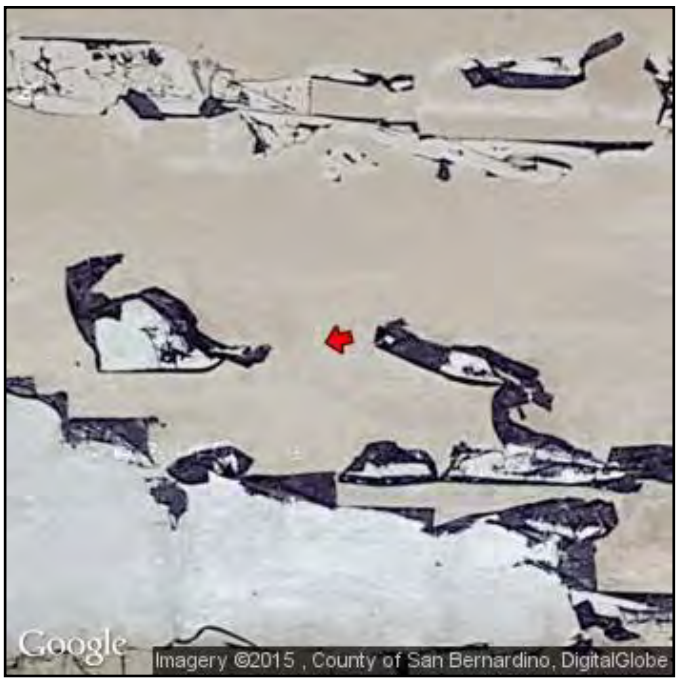
Attributes	
Comments	Inside north pond at about W-1 location
Photo ID	79

Photo ID: 80



Attributes	
Comments	Inside north pond at about W-2 location
Photo ID	80

Photo ID: 81

Attributes	
Comments	Sumps in between east and west ponds
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Attributes	
Comments	West pond
Photo ID	82

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Attributes	
Comments	East pond
Photo ID	83

Photo ID: 84

Attributes	
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Photo ID	84

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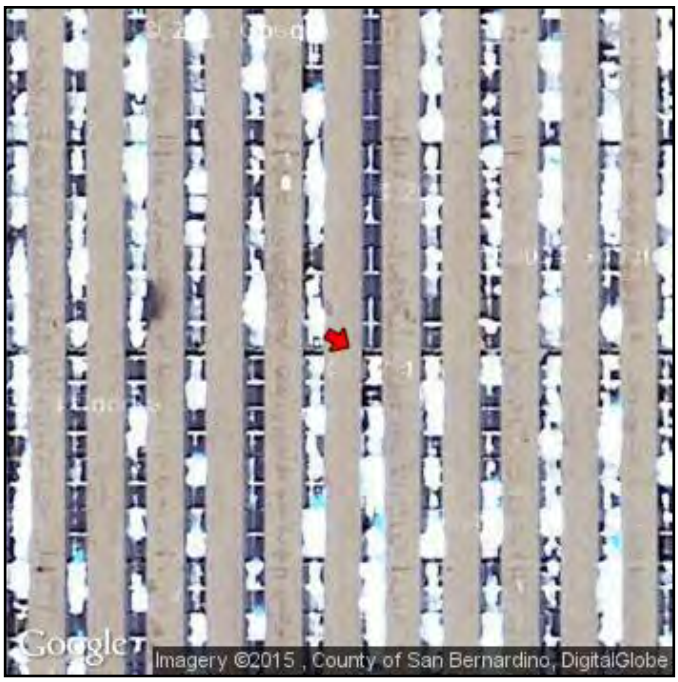

Attributes	
Comments	Location of soil vapor sample SV-1
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Attributes	
Comments	Area where site people (prior to Cogentrix) started a new land treatment unit and spread the contaminated soils from the fire pit area.
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Attributes	
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Attributes	
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Photo ID	91

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Attributes	
Comments	Heptane organics leaking out or water vapor condensate dripping off of pipe.
Photo ID	98

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Attributes	
Comments	Heptane organics leaking out of pipe or possibly water vapor dripping off of pipes.
Photo ID	99

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Attributes	
Comments	Caloria HTF pressure relief AST that is out of service.
Photo ID	100

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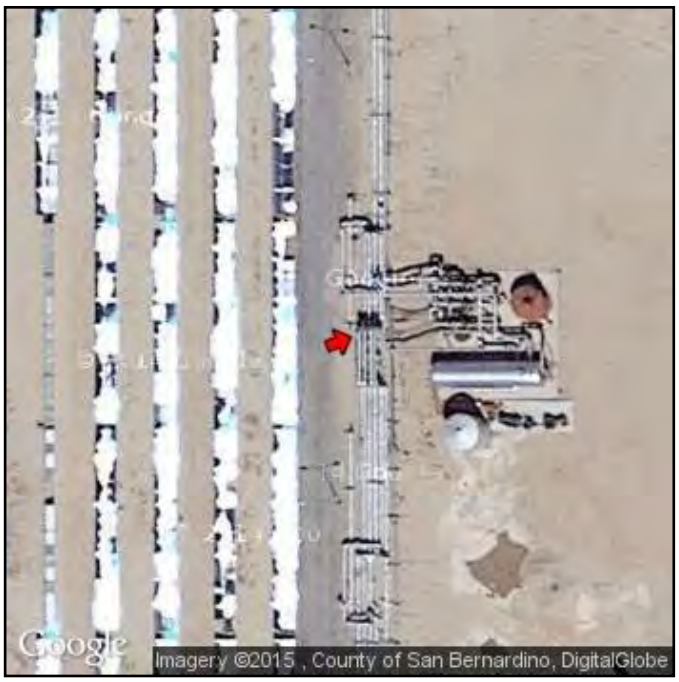

Attributes	
Comments	Distribution header area into Caloria storage tanks in fire pit.
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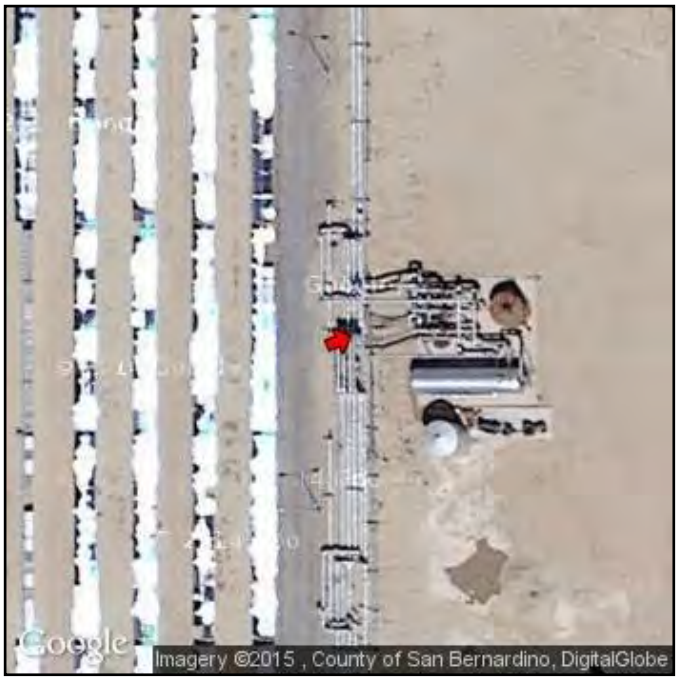

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Comments	See labels.
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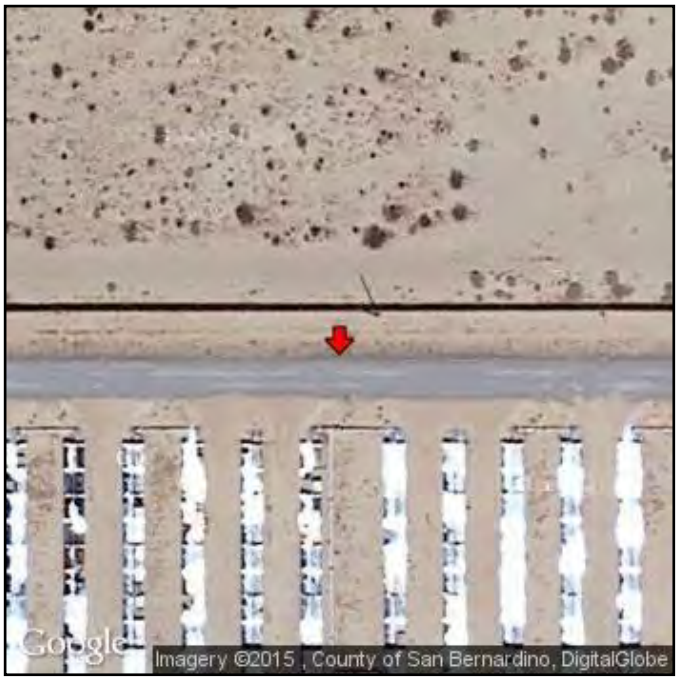

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Attributes	
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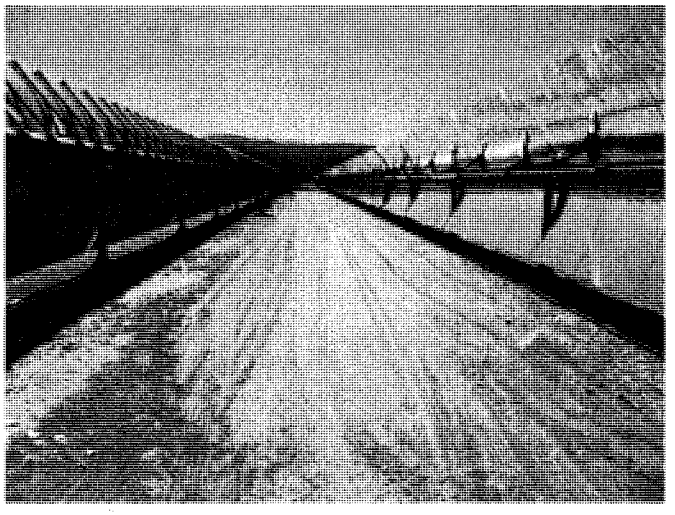
FINAL PHASE II ENVIRONMENTAL SITE ASSESSMENT

Solar Energy Generating System I & II
Daggett, California

San Bernardino County



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February 2009

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APPENDICES

1. INTRODUCTION

Tetra Tech EC, Inc. (TtEC) was retained by Cogentrix Energy, Inc. (Cogentrix) to perform both a Phase I Environmental Site Assessment (in accordance with "Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process," issued by American Society for Testing and Materials (ASTM) Standard E1527-05) and Phase II Field Investigation for the Sunray Energy, Inc. (Sunray) Solar Energy Generating System (SEGS) I and II, located in Daggett, California (the site). The following recognized environmental conditions were identified through completion of the Phase I ESA process.

- SEGS I & II Solar Arrays—Evidence of releases of heat transfer fluid (HTF) in SEGS I & II was identified below flex lines, piping joints, valves, and drain ports.

- SEGS I Power Block 1999 Fire—The 330-foot by 150-foot secondary containment pit located north of the SEGS I Power Block was the site of a catastrophic tank failure, resulting in a 750,000 to 1,000,000-gallon HTF release, a Heptane release up to a maximum of 10,000 gallons, a Toluene release up to a maximum of 20,000 gallons, and fire in February 1999.

- Groundwater at the SEGS I Power Block—The large release of HTF mentioned above warrants a sample of the groundwater from the closest well in the vicinity.

- SEGS I Power Block—Stained soil was found at a Caloria expansion tank where HTF pumping operations take place.

- SEGS II Power Block—Stained soil was found below a hand crafted Therminol expansion system, industrial air compressor, and PCB oil containing transformer (as identified on the transformer identification plate).

- SEGS II Cooling Tower—A large stained area (approximately 100 feet by 50 feet) with white precipitate was located east of the acid tank secondary containment.

- Equipment Yard—Soil staining around open drums of HTF, piles of used flex lines, and drum storage area.

- HTF Impacted Soils Stockpiles—Two areas at the site were used historically for the stockpiling of HTF impacted soils. These two areas were near the southwestern-most corner of SEGS I and the southern-most portion of SEGS II, just east of the cooling tower. The practice of storing impacted soils in these areas could potentially have resulted in impacts to the underlying soil

- Therminol Burial Area—Approximately 100 feet east of SEGS II eastern boundary (east fence) 1,000 to 2,000 gallons of Therminol was buried and reportedly cleaned up. The affected area is approximately 20 feet by 200 feet.

This document comprises a summary of the Phase II Field Investigation. The ultimate objective of the Phase II Field Investigation was to develop sufficient data to develop an estimate of costs for eventual site remediation. Tetra Tech EC retained Northgate Environmental Management, Inc. (Northgate) to assist with the Phase II Field Investigation. Interphase Environmental Inc. was contracted by Northgate to perform the direct push drilling needed to conduct the investigation. Soil borings were advanced at 55 locations from December 2 through 6, 2008. The locations of these borings are illustrated in Figure 1. All field operations were coordinated and conducted under Tetra Tech EC personnel oversight. The

Northgate Environmental Management, Inc. Phase II Environmental Site Assessment Solar Energy Generating System 1 & 2 Daggett, California report is included in Appendix A as supporting documentation for this report

2. SITE DESCRIPTION

SEGS I and II are two Concentrated Solar Power (CSP) generating facilities, co-located on a 333-acre site. SEGS I, located in the northern portion of the site, is rated at 14.7 megawatts, while the larger SEGS II, located in the southern and southwestern portions of the site, is rated at 30 megawatts. Both CSP facilities operate using parabolic trough technology. This technology uses trough-shaped reflectors (mirrors), which focus the sun's energy on a glass encapsulated tube containing heat transfer fluid (HTF). The heated HTF, which is a high temperature oil, moves through the tubes to a central facility location (power block) where it is used to generate steam, which in turn is used to power a turbine generator. Two HTFs have been used extensively at the site. The HTF used at SEGS I is Caloria HT-43, which is a de-waxed paraffinic petroleum distillate. At SEGS II, the HTF of choice is Therminol VP-1 (Dowtherm A), which is a eutectic mixture of biphenyl and diphenyl oxide. Based on manufacturers Material Data Safety Sheets (MSDS), Therminol VP-1 can contain small concentrations of benzene.

3. SITE HISTORY

Prior to development as a solar generating facility, the site was used for agricultural purposes. The land was originally part of the Van Dyke Ranch, which later became the Cool Water Ranch before being sold to Southern California Edison (SCE).

LUZ, the original developer of SEGS I & II, leased the project site from SCE. LUZ eventually went into bankruptcy and the project was acquired by Daggett Leasing Corporation (DLC). Eric Wills, the principal owner of DLC, later changed the project's name to Sunray Energy Inc. In addition, the project purchased the land from SCE. However, SCE retains a first right of refusal should the property be sold at some future date.

4. PHASE II FIELD INVESTIGATION

As part of the implementation of the Phase I ESA, TtEC identified several recognized environmental conditions (RECs) at the site. The identified RECs were grouped into nine different areas within the site. The Phase II field investigation consisted of environmental sampling at each of the nine REC areas. With the exception of the groundwater REC, soil samples were collected with a direct push drill rig and analyzed by Test America, a California accredited lab, for potential contaminants selected based on institutional knowledge of operational history and chemical usage at those REC areas.

At each location, the objective was to determine the vertical and areal extents of HTF impacts to allow for the calculation of an estimated volume of impacted soil. The field team relied on visual indications of impact and odor to guide the sampling program. A cleanup standard of 100 milligrams per kilogram (mg/kg) for TPH in HTF impacted soil was previously established under the site Clean Up and Remediation Plan, dated August 1, 1997. Estimated volumes of impacted soils above the 100 mg/kg are included in Table 1. A summary description of sampling activities at each REC is provided below.

4.1 SEGS I &II Solar Array Stained Areas

During the Phase I ESA, TtEC identified approximately 100 stained areas in the solar array fields. Most of these stained areas are attributable to the release of HTF. Many of these stains cover very small areas, and likely do not represent significant impacts to the environment. Accordingly, only a subset of the stains identified during the Phase I ESA was sampled in the Phase II Investigation.

Accordingly, 38 borings within the SEGS I Solar Array and 17 borings within the SEGS II Solar Array were drilled at stained areas covering 50 square feet or more. Within the SEGS I Solar Array, 64 soil samples were collected and analyzed for Total Petroleum Hydrocarbon – Carbon Chain (TPH-cc), diphenyl oxide/biphenyl, and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX). Within the SEGS II Solar Array, 47 soil samples were collected and analyzed for TPH-cc and diphenyl oxide/biphenyl; 46 of these samples were also analyzed for BTEX.

Based on analytical results and field observations of the area of surface staining and depth of staining within the soil cores, an estimated volume of impacted soil was calculated. Approximately 3,300 cubic yards of contaminated soil within the SEGS I Parabolic Array and 954 cubic yards of impacted soil within the SEGS II Parabolic Array were delineated from the Phase II Investigation.

Of the 3,300 cubic yards of impacted HTF soil within the SEGS I Parabolic Array only 1275 cubic yards exceeded the cleanup standard of 100 mg/kg. Of the 954 cubic yards of impacted soil within the SEGS II Parabolic Array only 182 cubic yards exceeded the cleanup standard of 100 mg/kg.

4.2 SEGS I Fire Remediation Area

A major fire occurred in the Chevron Caloria HTF tank farm containment area in close proximity to the SEGS I power block in 1999. During the fire, approximately 1 million gallons of caloria, a maximum of 10,000 gallons Heptane, and a maximum of 20,000 gallons of Toluene were released and burned in the former tank basin north of the SEGS I Administration Building (north side of SEGS I power block). The Phase I ESA conducted by TtEC, Inc. in October 2008 identified a 10,000 gallon Heptane AST and two 10,000 gallon Toluene AST's involved in this fire. It is believed, based on interviews conducted during the Phase I ESA, the fire was allowed to burn itself out. Analysis for semi volatile organic compounds was suggested for this REC due to the potential for products of incomplete combustion.

Three soil borings were advanced to 20 feet bgs within this area, eight soil samples were collected from 4 to 5 feet bgs up to 19 to 20 feet bgs, and analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. Six of the eight samples were analyzed for Semi -Volatile Organic Compounds (SVOCs). Based on an 8-foot depth of impact and the size of the tank basin, an estimate of 4,444 cubic yards of impacted soil exceeded the cleanup standard of 100 mg/kg within this area.

4.3 SEGS I Power Block Groundwater

Groundwater was also a REC of interest within the SEGS I Power Block. Groundwater at the site is encountered at approximately 150 feet below land surface. Due to this depth, the viscous nature of HTF at ambient temperatures, and the expected presence of intervening low-permeability layers (caliche), HTF constituents were not expected to have contacted the water table. However, the possibility of contact with the groundwater could not be totally discounted, especially in the area of the SEGS I fire.

A discreet groundwater sample was collected from the groundwater supply well located in the SEGS I power block and analyzed for volatile organic compounds (VOCs) and diphenyl oxide/biphenyl. Analytical results showed the only detection to be toluene at a concentration of 0.65 micrograms per liter

(mg/L), a level approximately 230 times less than the Title 22 California Code of Regulations Related to Drinking Water, the maximum contaminant level for public water supplies - 0.15 milligrams per liter (mg/L). This concentration is very close to the laboratory detection limit. Given the depth to groundwater and the common occurrence of toluene as a laboratory contaminant, this low-concentration detection could be a false positive. However, since toluene was used at the SEGS I Power Block as an industrial cleaner and may have been released in the 1999 fire, its presence in groundwater is possible.

4.4 SEGS I Power Block

One location near the SEGS I Power Block caloria expansion tank contained a significant area of stained soil where HTF pumping operations were taking place. At this location, a boring was advanced to 12 feet below ground surface (bgs), and three soil samples were collected and analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. TPH was detected (only) at a concentration of 350 mg/kg within the 0 to 1 foot bgs interval. The non-detect analytical results in the 5 to 6-foot bgs interval confirm the impact is limited to the near surface. Based on the confirmed depth of impact and the area of the stained soil at the surface, an estimate of 4.4 cubic yards of impacted soil exceeded the cleanup standard of 100 mg/kg within this area.

4.5 SEGS II Power Block

During the Phase I ESA, three locations were identified as areas of significant or special interest soil staining. A large and dark soil stain was identified below a hand crafted therminol expansion system, and a large soil stain was identified around an industrial air compressor. Soil staining below a large PCB oil containing transformer was of special interest.

At the location below the SEGS II Power Block hand crafted therminol expansion system, a boring was drilled to 16 feet bgs, and four soil samples were collected for TPH-cc, diphenyl oxide/biphenyl, and BTEX. Analytical results showed only TPH detections of 12,000 mg/kg and diphenyl oxide of 2,500 mg/kg within the 0 to 1-foot bgs interval, confirming only surface impact. Based on the confirmed depth of impact and the area of the stained soil at the surface, an estimate of 14.8 cubic yards of impacted soil exceeded the cleanup standard of 100 mg/kg within this area.

Numerous unmapped underground utilities prevented direct push drilling activities at the PCB oil containing transformer and industrial air compressor locations within the SEGS II Power Block. No sample was collected at the industrial air compressor. As an alternative, hand tools were incorporated to collect a surface soil sample below the PCB oil containing transformer. This sample was analyzed for TPH-cc, diphenyl oxide/biphenyl, BTEX and PCB's. Below the transformer, TPH was detected (only) at a concentration of 2,800 mg/kg and PCB's were not detected suggesting the source may not be the transformer and could possibly be from another petroleum spill.

4.6 SEGS II Cooling Tower

A large area with a white crust was identified during the Phase I ESA. It was located east of the SEGS II cooling tower and adjacent to the chemical Above Ground Storage Tank (AST) secondary containment units. The source of the spill was noted to be from a breach in the concrete of the AST secondary containment, which contained sulfuric acid.

Three borings were drilled in the area of the white crust to a depth of 12 feet bgs. Nine soil samples were collected and analyzed for pH and results varied from 7.63 to 8.63. The analytical results indicate the pH of the soil at the boring locations is close to neutral and no acidic impacts remain in this area.

4.7 Equipment Yard

Soil staining around open drums of waste HTF, piles of used flex lines, and drum storage area was identified during the Phase I ESA. Ten samples were collected from five borings drilled in this area (EY_1 through EY_5).

Locations EY_1 and EY_3 were associated with surface soil stains likely from HTF. Each boring was drilled to 12 feet bgs and samples were collected from the 0 to 1-foot and 5 to 6-foot bgs intervals. All four samples were analyzed for TPH-cc, diphenyl oxide/biphenyl, and Volatile Organic Compounds (VOCs) (including BTEX). Analytical results only showed detections of TPH at 150 mg/kg and diphenyl oxide at 110 milligram per kilogram (mg/kg) within the 0 to 1-foot bgs interval of EY_1.

Locations EY_2, EY_4, and EY_5 were associated with surface soil stains where the potential source was from drums containing petroleum products for machinery. Each boring was drilled to 12 feet bgs and samples were collected from the 0 to 1-foot and 5 to 6-foot bgs intervals. All six samples were analyzed for TPH-cc, diphenyl oxide/biphenyl, VOCs (including BTEX), Total Petroleum Hydrocarbon – Gasoline (TPH-g), and Total Petroleum Hydrocarbon – Diesel (TPH-d). TPH-d was only detected at each location within the 0 to 1-foot bgs interval and varied in concentration from 100 to 3,400 mg/kg. TPH-cc was detected at each location within the 0 to 1-foot bgs interval and varied in concentration from 140-22,000 mg/kg; a TPH-cc detection of 9.9 mg/kg was detected within the 5 to 6-foot bgs interval of EY_5. Persistent, slow leaking of machinery parked at and around EY_5 may have resulted in relatively deeper (5 to 6 feet bgs) impact at this location.

The volume of impacted soil exceeding the cleanup standard of 100 mg/kg from borings EY_1, EY_2, EY_4, and EY_5 is estimated at 29 cubic yards (combined).

4.8 HTF Impacted Soils Stockpiles

Two areas at the site were used historically for the stockpiling of HTF impacted soils. These two areas were near the southwestern-most corner of SEGS I and the southern-most portion of SEGS II, east of the cooling tower. The practice of stockpiling impacted soils in these areas could potentially have resulted in impacts to the underlying soil.

Two borings were advanced to 12 feet bgs (I_SP1, II_SP1, and II_SP2) and 16 feet bgs (I_SP2) within each of the former SEGS I and SEGS II impacted soil stockpile locations, nine soil samples were collected and analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. TPH was only detected at a concentration of 85 mg/kg within the 0 to 1-foot bgs interval at I_SP2 and is likely due to residual surface impact originating from the stockpile. Remediation at and around I_SP2 is not required because the detection did not exceed the cleanup standard of 100 mg/kg.

4.9 Therminol Disposal Area

Therminol is reported to have been disposed at this location in 1986. The affected area is approximately 100 feet east of SEGS II Eastern boundary (fence) and is approximately 20 ft by 200 ft. Cleanup is reported to have occurred in 1989, and this sampling was performed to verify that cleanup was effective. Delineation of the area was aided by historical photographs obtained for the Phase I ESA showing an excavated area after 1989.

Within this area two soil borings were advanced to 12 feet bgs, four soil samples were collected from the 0 to 1-foot bgs and 5 to 6-foot bgs intervals within each boring, and analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. Only toluene was detected in boring TDA-2 at a concentration of 4.2 µg/kg

within the 5 to 6-foot bgs interval. Considering that this detection is well below the U.S. EPA Soil Screening Level for toluene is 12 mg/kg, the absence of TPH-cc detections, and lack of field observations supporting impacted soil, it is not likely soil remediation or further investigation is needed at this area.

5. REMEDIAL COST ESTIMATE

Ex-Situ bioremediation techniques are known to be successful in the remediation of soils and sludges contaminated with petroleum hydrocarbons (including HTF). Discussions with the current site owner suggest that this technique has been successful in rapidly reducing HTF concentrations in HTF impacted soil. Given the reported success of this technique, we have assumed for the purpose of cost estimating that ex-situ bioremediation (specifically land farming) is the preferred remedial technology for this site.

Land farming is a full-scale bioremediation technology, which usually incorporates liners and other methods to control leaching of contaminants. The technique requires excavation and placement of the contaminated soils into lined beds, and the periodic tilling to aerate the waste. The addition of pH buffering materials, as well as water and possibly other constituents (nutrients), may also be required.

The exact design of the land farming system, or biological enhancements has not been investigated and as such is not yet determined. Typically, however, in addition to the development of a leachate control (lining) system, soil conditions during remediation are often routinely monitored and controlled to optimize the rate of contaminant degradation. Conditions normally controlled include:

- Moisture content (usually by irrigation or spraying).
- Aeration (by tilling the soil with a predetermined frequency, the soil is mixed and aerated).
- pH (buffered near neutral pH by adding crushed limestone or agricultural lime).
- Other amendments (e.g., Soil bulking agents, nutrients, etc.).

Contaminated media is usually treated in lifts up to 18 inches thick. When the desired level of treatment is achieved, the lift is removed and a new lift is constructed. It may be desirable to only remove the top of the remediated lift and then construct the new lift by adding more contaminated media to the remaining material and mixing. This serves to inoculate the freshly added material with an actively degrading microbial culture, and can reduce treatment times.

To ensure optimization of treatment and the correct design of the treatment cell the following site and soil considerations should be addressed prior to implementation: surface geological features (e.g., topography and vegetative cover), subsurface geological and hydrogeological features, temperature, precipitation, wind velocity and direction, water availability, soil type and texture, soil moisture content, soil organic matter content, cation exchange capacity, water-holding capacity, nutrient content, pH, atmospheric temperature, permeability, and microorganisms (degradative populations present at site).

In designing the land farm the following should be considered:

- A large amount of space is required.
- Conditions affecting biological degradation of contaminants (e.g., temperature, rain fall) are largely uncontrolled, which increases the length of time to complete remediation.
- Inorganic contaminants will not be biodegraded.
- Volatile contaminants must be pretreated (or other engineering consideration made [such as a cover]) because they would volatilize into the atmosphere, causing air pollution.

- Dust control is an important consideration, especially during tilling and other material handling operations.

- Runoff collection facilities must be constructed and monitored.

- Topography, erosion, climate, soil stratigraphy, and permeability of the soil at the site must be evaluated to determine the optimum design of facility.

Based upon some of the factors discussed above and data derived from the Federal Remediation Technologies Roundtable (FRTR - http://www.frtr.gov/) typical costs for the assessment, design and implementation of a land farming operations are likely to be as follows:

- Costs prior to treatment (assumed to be independent of volume to be treated): $25,000 to $50,000 for laboratory studies; and $100,000 for pilot tests or field demonstrations.

- Cost of prepared bed (ex situ treatment and placement of soil on a prepared liner): Costs for this element can be very variable depending upon the complexity of the system; in this case a FRTR cost estimate has been used at $100 per cubic meter ($75 per cubic yard). Actual costs will depend upon the requirement of additional constituents and HTF concentrations.

The cost estimate for this site is presented in Table 2.

Table 2. Remedial Action Cost Estimate

Remedial Action	Cost (Estimated)
Laboratory Studies	$25,000–$50,000
Remedial Action Plan, Agency Agreement, Pilot Studies, Design	$100,000
Landfarm construction and operating cost based upon 5,950 cubic yards	$446,250
Decommission Costs – Land farm soil removal and replacement, liner removal and soil validation costs, close out report and agency agreement (estimate)	$100,000
Total (Estimated Cost)	$671,250–$696,250

6. PHASE II SITE ASSESSMENT—CONCLUSION

Observations made during the Phase I ESA and the data collected for the Phase II Site Assessment support that impacted soil is widespread throughout the site and is generally limited to the near surface. This Phase II Site Assessment concluded the following REC areas contain minimal to large quantities of impacted soil:

- SEGS I & II Parabolic Arrays
- SEGS I Power Block Fire Remediation Area
- SEGS I Power Block
- SEGS II Power Block
- Equipment Yard

Soil samples from borings dilled in these areas were analyzed to provide depth-profiles of the impact and obtain a clean confirmation sample below the impacted area. Using the analytical data (principally TPH-cc analytical data) and visual observations of stained soils obtained during drilling, the total volume of

impacted soils at each boring location was approximated. Table 1 contains a listing of the depth of TPH impact, the lateral area of the stained zone, and the estimated volume of impacted soils that exceeded the site cleanup standard of 100 mg/kg.

A total of 29 areas were identified where TPH-cc was found to depths ranging from 1 to 16 feet bgs, for a total estimated volume of 5,950 cubic yards of impacted soil that exceeded the site cleanup standard of 100 mg/kg. This estimated volume of impacted soil could be greater due to the inaccessibility of sampling locations below HTF header piping, next to mirror upright foundations, and within the Power Blocks. In comparison, HSI GeoTrans estimated the volume of impacted soil on the site to be 7,963 cubic yards as disclosed in their 1997 Phase II Site Assessment (*Comprehensive Environmental Assessment Report Solar Electric Generating Systems I & II 35100 Santa Fe Street Daggett, California,* HSI GeoTrans, 1997). If the volume of impacted soil generated from the SEGS I Power Block Fire Remediation Area (4444 cubic yards) is subtracted from the estimated total (5,950 cubic yards), it would suggest site operations and infrastructure improvements since 1997 have reduced the amount of impacted soil on the site.

7. SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

Preparation of this report was conducted by the following TtEC personnel:

Paul Dupre, Associate Geologist/Task Manager

This Phase I ESA was reviewed by the following TtEC personnel:

Charles D. Senz
Manager, Commercial Projects

Andrew Brack
Project Manager/California Registered Geologist

FIGURES

TABLES

Table 1

Estimated Volume of Impacted Soils Above 100 mg/kg

SEGS I and II Daggett, California

Project Area	Description	Location	Boring ID	Depth of TPH Impact >100mg/kg	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)	TPH Concentration C13 - C44 (mg/kg)
SEGS I Power Block	15 ft x 4 ft soil stain near rubber piping and pump	South of Caloria expansion tank system/slab	I_ET	2	60.0	120.0	4.4	350.0
SEGS I Parabolic Array	5 ft x 20 ft soil stain oriented east/west below flex line	South side between rows 29 H and 30 H	I_29H	2	100.0	200.0	7.4	27000.0
	48 ft x 30 ft dark soil stain between two rows of mirrors	Between rows 27 G and 28 G	I_28G-1 I_28G-2	2	1440.0	2880.0	106.7	520 - 3,400
	90 ft x 30 ft dark soil stain between two rows of mirrors	Between rows 24 F and 25 F	I_24F-1 I_24F-2	2	2700.0	5400.0	200.0	16000.0
	75 ft x 30 ft soil stain below mirrors and in isle	Along rows 19 E and 19 F	I_19E-1 I_19E-2	2	2250.0	4500.0	166.7	10,000 - 21,000
	60 ft x 5 ft soil stain with a northern section measuring 10 ft x 30 ft	Below row 20 G	I_20G	2	600.0	1200.0	44.4	730.0
	10 ft dia. Soil stain around concrete foundation – below flex line	Between rows 4 B and 4 C	I_4B	2	78.5	157.0	5.8	17000.0
	15 ft dia. Soil stain below mirrors	Row 12 B	I_12B	2	176.6	353.3	13.1	13000.0
	20 ft dia. (old) soil stain below mirrors – soil appears to have been previously removed in this area	Row 17 B	I_17B	5	314.0	1570.0	58.1	4800.0
	20 ft x 6 ft soil stain near control box	Row 23 B	I_23B	2	120.0	240.0	8.9	11000.0
	40 ft long by 10 to 20 ft wide soil stain below mirrors	Between rows 23 B to 23 C	I_23B/C	2	800.0	1600.0	59.3	4400.0
	10 ft x 8 ft soil stain below mirrors	Row 23 C	I_23C	2	80.0	160.0	5.9	8500.0
	21 ft x 5 ft light colored soil stain below mirrors	Row 36 B	I_36B	2	105.0	210.0	7.8	25000.0
	10 ft x 8 ft soil stain below header pipe	South end of row 73 D	I_73D	15	80.0	1200.0	44.4	130 - 23,000
	45 ft x 40 ft soil stain extending across two rows of mirrors	Across rows 61E/61 F and 62 E/62 F	I_61F-1 I_61F-2	8	1800.0	14400.0	533.3	16,000 - 28,000
	8 ft dia soil stain at base of upright around concrete foundation	North side of row 81 E	I_81E	7	50.2	351.7	13.0	630 - 7,600
						SEGS I Parabolic Array Total	**1274.9**	

Table 1

Estimated Volume of Impacted Soils Above 100 mg/kg

SEGS I and II Daggett, California

Project Area	Description	Location	Boring ID	Depth of TPH Impact >100mg/kg	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)	TPH Concentration C13 - C44 (mg/kg)
SEGS II Power Block	3 ft x 1.5 ft soil stain below PCB transformer cooling fins. No leak was identified from the transformer.	North side of transformer S/N: SEW7439-0101	II_PB-2	1	5.0	4.5	0.2	2800.0
	Soil staining extending beyond concrete pad under 750K gal. Therminol AST vapor release system.	At, around, and beyond two 55 gallon drums with piping on north east corner of 750K gal Therminol AST	II_PB-1	2	200.0	400.0	14.8	12000.0
						SEGS II Power Block Total	**15.0**	
SEGS II Parabolic Array	8 ft dia soil stain round upright concrete foundation	South end of 37 H	II_37H	8	50.2	401.9	14.9	10,000 - 20, 000
	Odorous 10 ft dia soil stain, below a control box and at base of upright	Row 27 H	II_27H	2	78.5	157.0	5.8	2700.0
	Dark 5 ft dia soil stain at base of upright around concrete foundation and 15 ft x 4 ft light soil stain across isle	Row 5 G	II_5G	2	78.5	157.0	5.8	22000.0
	Soil stain extending 6 ft beyond base of upright around concrete foundation	Between rows 31 A and 31 B	II_31A	8	113.0	904.3	33.5	7,600 - 10,000
	12 ft dia soil stain below valve	South side of 36 K	II_36K	8	113.0	904.3	33.5	9,500 - 25,000
	17 ft x 11 ft Soil stain below flex line drain	Row 16 J	II_14J	12.8	187.0	2393.6	88.7	5,100 - 6,900
						SEGS II Parabolic Array Total	**182.2**	

Table 1

Estimated Volume of Impacted Soils Above 100 mg/kg

SEGS I and II Daggett, California

Project Area	Description	Location	Boring ID	Depth of TPH Impact >100mg/kg	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)	TPH Concentration C13 - C44 (mg/kg)
Equipment Yard	Light 15 ft dia. Soil stain	Off the SW corner of the southern central pile of flex lines in the northern equipment yard	EY-1	2	176.6	353.3	13.1	150.0
	Three soil stains, the largest is a 15 ft x 5 ft soil stain originating from 55 gal drum storage pad	SE corner of equipment yard along drum storage pad. The largest stain is on north end of N-S oriented drum storage pad	EY-2	1	75.0	75.0	2.8	13000.0
	Dark soil stain extending 7 ft beyond unlabeled drum	NE corner of inner fenced section of equipment yard	EY-4	1	153.9	153.9	5.7	140.0
	Seven soil stains below equipment parked along western boarder of equipment yard. Stains are dark to very dark and varied in size from 4 ft dia to 10 ft x 6 ft.	Equipment parking area along the western boarder of the equipment yard below a bobcat, earth mover, dump truck, water truck and open areas.	EY-5	1	201.0	201.0	7.4	22000.0
						Equipment Yard Total	**29.0**	
SEGS I Fire Remediation Area			I_FRA-1 I_FRA-2 I_FRA-3	8	15000.0	120000.0	4444.4	580 - 8,100
						Total Volume of Contamination (cubic yards)	**5949.9**	

APPENDIX A

Northgate Environmental Management, Inc.
Phase II Environmental Site Assessment
Solar Energy Generating System 1 and 2
Daggett, California

(Provided on CD)

Phase II Environmental Site Assessment
Solar Energy Generating System 1 & 2
Daggett, California

December 22, 2008

Prepared For:

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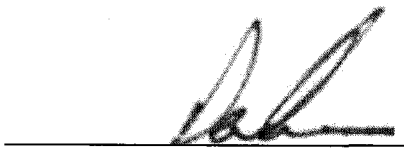

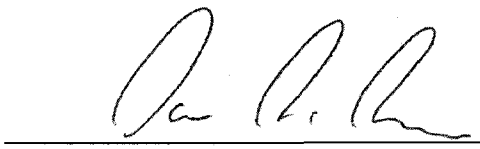

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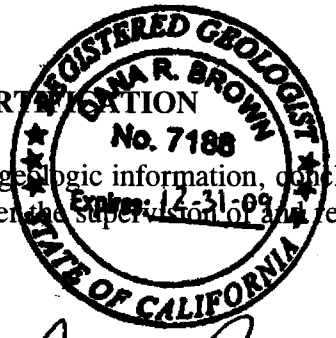

CERTIFICATION

All geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by a Northgate California Professional Geologist.

December 22, 2008

Dana R. Brown, PG — Date
Senior Geologist
California Professional Geologist #7188

This document was prepared by:

December 22, 2008

Bettie A. Bechtel — Date
Senior Staff Geologist

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1.0 INTRODUCTION

This report presents the results of a Phase II Environmental Site Assessment (ESA) performed at the Solar Energy Generating System 1 & 2 property located at 35100 Santa Fe Road in Daggett, San Bernardino County, California ("the Site"). The Site totals approximately 333 acres of land situated in the Western Mojave Desert and improved with two operating solar electric generating facilities (solar electric generating system [SEGS] I and SEGS II). The Site location is shown on Figure 1, and a Site Plan is shown on Figure 2.

1.1 Authorization

Tetra Tech EC, Inc. (Tetra Tech) requested that Northgate Environmental Management, Inc. (Northgate) conduct a Phase II ESA to assess recognized environmental conditions identified by Tetra Tech. The objective and scope of work for this assessment were outlined in Northgate's proposal dated November 20, 2008.

1.2 Objectives

The primary objectives of the Phase II ESA were to evaluate the potential presence of constituents of concern that may have been associated with recognized environmental conditions identified by Tetra Tech. The recognized environmental conditions are listed below:

- Approximately 100 stained soil areas, mostly attributable to the release of heat transfer fluid (HTF). Many of these stains cover very small areas, and likely do not represent significant impacts to the environment. Only a subset of these stains will be sampled.
- Therminol Disposal Area: An estimated 1,500 to 2,000 gallons of Therminol VP-1 were disposed in 1986, in an area approximately 100 feet east of the SEGS II eastern boundary (east fence). Cleanup occurred in 1989. The affected area was approximately 20 feet by 200 feet.
- HTF-contaminated stockpiles: Two areas were historically used for the stockpiling of HTF-contaminated soils. These were near the southwesternmost corner of SEGS I and the southernmost portion of SEGS II, just east of the cooling tower.
- SEGS I Fire Remediation Area: A major fire occurred in the SEGS I power block in 1999. During the fire, approximately one million gallons of caloria and unknown quantities of heptanes and toluene were released and burned in the former tank basin north of the SEGS I Administration Building (north side of SEGS I power block).

In addition, groundwater at the Site is encountered at approximately 150 feet below ground surface (bgs). Due to this depth, the viscous nature of HTF at ambient temperatures, and the

expected presence of intervening low-permeability layers (caliche), HTF constituents are not expected to have contacted the water table. However, the possibility of contact with the groundwater cannot be totally discounted, especially in the area of the SEGS I fire. There is also a series of monitoring wells at the evaporation ponds, southeast of the main plant. Groundwater in this area may have been impacted with inorganic constituents generated in the evaporative process of cooling and process water.

1.3 Scope of Work

The scope of work for this Phase II ESA included the following activities:

- **SEGS I Parabolic Array** – Advancement of 21 borings in the SEGS I Parabolic Array area to a maximum depth of 20 feet below ground surface (bgs). Samples were collected at five-foot intervals until field observations (discoloration, odors, photoionization detector readings, other indications of the possible presence of contamination) indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons for the carbon range of C13-C44 (TPH-cc), and diphenyl oxide/biphenyl.
- **SEGS I Power Block** – Advancement of one boring (I_ET) in the SEGS I Power Block area to a depth of 12 feet bgs. Samples were collected at five-foot intervals until field observations indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of the boring. The confirmation soil sample was analyzed for BTEX, TPH-cc, and diphenyl oxide/biphenyl. In addition, a groundwater sample (GW-1) was collected from a production well in the SEGS I Power Block area. The groundwater sample was analyzed for VOCs and for diphenyl oxide/biphenyl.
- **SEGS I Fire Remediation Area** – Advancement of three borings (I_FRA-1, I_FRA-2, and I_FRA-3) in the SEGS I Fire Remediation Area to a maximum depth of 20 feet bgs. Samples were collected at five-foot intervals until field observations indicated that the soil was not impacted. Confirmation samples were collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for BTEX, TPH-cc, diphenyl oxide/biphenyl, and for semi-volatile organic compounds (SVOCs).
- **SEGS II Parabolic Array** – Advancement of 17 borings in the SEGS II Parabolic Array area to a maximum depth of 20 feet bgs. Samples were collected at five-foot intervals until field observations (discoloration, odors, photoionization detector readings, other indications of the possible presence of contamination) indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for BTEX, TPH-cc, and diphenyl oxide/biphenyl.
- **SEGS II Power Block** – Advancement of one boring (II_PB-1) in the SEGS II Power Block area near a 750 gallon Therminol AST to a depth of 12 feet bgs. Samples were

collected at five-foot intervals until field observations indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of the boring. The confirmation soil sample was analyzed for BTEX, TPH (C13-C44), and diphenyl oxide/biphenyl. In addition, a shallow soil sample (II_PB-2) was collected near the transformer cooling fins at a depth of 0.5 foot bgs. The soil sample was analyzed for BTEX, TPH-cc, diphenyl oxide/biphenyl, and polychlorinated biphenyls (PCBs).

- **SEGS II Cooling Tower** – Advancement of three shallow borings (II_CT-1, II_CT-2, and II_CT-3) in the SEGS II Cooling Tower area to a maximum depth of 12 feet bgs. Samples were collected at five-foot intervals and analyzed for pH.
- **Equipment Yard** – Advancement of five shallow borings (EY-1 through EY-5) in the equipment yard area to a maximum depth of 20 feet bgs. Samples were collected at five-foot intervals until field observations indicated that the soil was not impacted. Confirmation samples were collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for BTEX, TPH-cc, and diphenyl oxide/biphenyl. Selected samples were also analyzed for TPH-gasoline (TPH-g), and TPH-diesel (TPH-d).
- **HTF Contaminated Soils Stockpiles** – Advancement of two borings in each of the two HTF Contaminated Soils Stockpiles areas (I_SP-1, I_SP-2, II_SP-1, and II_SP-2) to a maximum depth of 11 feet bgs. Samples were collected at five-foot intervals until field observations indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for BTEX, TPH-cc, and diphenyl oxide/biphenyl.
- **Therminol Disposal Area** – Advancement of two borings in the Therminol Disposal area (TDA-1, TDA-2) to a depth of 12 feet bgs. Samples were collected at five-foot intervals until field observations (discoloration, odors, photoionization detector readings, other indications of the possible presence of contamination) indicated that the soil was not impacted. A confirmation sample was collected from the "clean zone" of each boring. The confirmation soil samples were analyzed for BTEX, TPH-cc, and diphenyl oxide/biphenyl.

Boring locations in the SEGS I parabolic array are shown in Figure 3. Boring locations in the SEGS II parabolic array are shown in Figure 4. Boring locations outside of the array and the groundwater sample location are depicted on Figure 5. Table 5 lists the boring names, gives descriptions of the boring locations, and provides the rationale for placement of the boring.

1.4 Limitations

This assessment was conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

The opinions and recommendations presented in this report are based upon the scope of services, information obtained through the performance of the services, and the schedule as agreed upon by Northgate and the party for whom this report was originally prepared. This report is an instrument of professional service and was prepared in accordance with the generally accepted standards and level of skill and care under similar conditions and circumstances established by the environmental consulting industry. No other representation, warranty, or guarantee, express or implied, is intended or given. To the extent that Northgate relied upon any information prepared by other parties not under contract to Northgate, Northgate makes no representation as to the accuracy or completeness of such information.

This report is expressly for the sole and exclusive use of the party for whom this report was originally prepared for a particular purpose. Only the party for whom this report was originally prepared and/or other specifically named parties have the right to make use of and rely upon this report. Reuse of this report or any portion thereof for other than its intended purpose, or if modified, or if used by third parties, shall be at the user's sole risk.

Results of any investigations or testing and any findings presented in this report apply solely to conditions existing at the time when Northgate's investigative work was performed. It must be recognized that any such investigative or testing activities are inherently limited and do not represent a conclusive or complete characterization. Conditions in other parts of the project site may vary from those at the locations where data were collected. Northgate's ability to interpret investigation results is related to the availability of the data and the extent of the investigation activities. As such, 100% confidence in environmental investigation conclusions cannot reasonably be achieved.

Northgate, therefore, does not provide any guarantees, certifications, or warranties regarding any conclusions regarding environmental contamination of any such property. Furthermore, nothing contained in this document shall relieve any other party of its responsibility to abide by contract documents and applicable laws, codes, regulations, or standards.

1.5 User Reliance

This report has been prepared for the exclusive use of Tetra Tech EC, Inc. (Tetra Tech), Cogentrix Energy Inc. (Cogentrix), and their parent corporations, subsidiaries, affiliates, partner, partnerships, and lenders in use of the Site, and others may not rely on the information contained in this report without the express written consent of Northgate.

2.0 BACKGROUND

2.1 Site Description

The Site consists of approximately 333 acres of land located at 35100 Santa Fe Road in the Mojave Desert outside of Daggett, California. There are two operating solar electric generating facilities on the property: SEGS I, rated at 14.7 megawatts; and SEGS II, rated at 30 megawatts. SEGS I includes an east and west solar field, a power block, and a cooling tower. SEGS II includes north, south, east, and west solar fields, a power block, and a cooling tower. The facility also includes a common maintenance and equipment storage yard; office trailers and a main office building; and three Class II surface impoundments (evaporation ponds). The facility is currently owned by Sunray Energy, Inc.

2.2 Regional and Local Geology and Hydrology

The Site is situated within the Mojave Valley in the western Mojave Desert of the Mojave Desert geologic province. The Calico Mountains and the Calico Fault are located north and east of the Site, and the Newberry Mountains and the Lenwood Fault are located to the south. The underlying geology consists of extensive successions of undifferentiated Holocene alluvial deposits (Bortugno and Spittler, 1986). Near-surface sedimentary materials consist of intermixed sands, silts, clays, and localized gravels and cobbles. Layers of partially calcium carbonate-cemented sediments (caliche) are typical throughout the area at shallower depths. The caliche is formed by infiltrating rainfall dissolving salts near the ground surface, and then depositing the salt at the depth of maximum infiltration. The low rainfall and high evapotranspiration rate result in caliche layers in near surface soils.

The nearby Calico Mountains are highly colored bright green sedimentary and dark reddish-brown volcanic rocks of Tertiary age. From 1882 to 1896 the area was mined for its high-grade, low-tonnage silver deposits, and then until 1907 for borax (Sharp, 1972).

Water well drillers' reports for water production wells installed at the Site indicate that the geology to depths of approximately 400 feet bgs consists of an interlayered sequence of medium to coarse sand, fine sand, silt, and clay with localized gravel and cobbles. Clay layers of five- to 10-foot thickness are described in several of the logs.

The Site is situated within the Lower Mojave River Valley hydrogeologic groundwater basin, a 430-square-mile alluvial basin drained by the Mojave River through alluvial materials. Drainage is entirely internal with no discharge to the ocean. Reported well yields in the Lower Mojave

River Valley ranged from 560 to 1,700 gallons per minute (DWR, 1975). Saline deposits within the sediments of the basin limit local groundwater uses.

There are five groundwater production wells on the Site that supply process water. The depth to groundwater within these wells under pumping conditions is approximately 150 feet. Production well depths range from 300 to 400 feet. According to Daggett Leasing Corporation (DLC) records, groundwater use at the Site from 1987 through 1996 averaged 321.61 acre feet per year, and ranged from 111.01 to 440.57 acre feet per year (HIS GeoTrans, 1997).

Protection of groundwater quality in the area is under the authority of the Regional Water Quality Control Board – Lahontan District (RWQCB). Information obtained through the RWQCB indicates the presence of approximately 12 groundwater production wells and approximately 10 groundwater monitoring wells on Southern California Edison- (SCE-) owned property, which surrounds and includes the Site. The production wells are used to supply the Solar Two facility and the Edison Coolwater Generating Station, and for agricultural purposes. Edison performs quarterly groundwater sampling on their property under Waste Discharge Requirement No. 6-84-29.

Groundwater resources in the area are managed by the Mojave Water Agency (MWA). The MWA has several monitoring wells within the general area of the Site. The MWA maintains records of groundwater irrigation and industrial production wells near the Site.

Groundwater beneath the Site flows north to northeast towards the Mojave River.

3.0 FIELD INVESTIGATION

Northgate conducted soil and groundwater sampling at the Sunray Energy property located at 35100 Santa Fe Road in Daggett, California. These sampling activities were performed to assess the recognized environmental conditions identified in the Phase I ESA report discussed above.

3.1 Preparation of Sampling Locations

Before sampling activities began, Northgate coordinated scheduling and Site access with Tetra Tech, Inc. Other pre-field activities included the following specific tasks.

3.1.1 Health and Safety Plan Preparation

Northgate prepared a site-specific Health and Safety Plan (HASP) for the Phase II assessment. The HASP was prepared in accordance with applicable federal and state regulations (29CFR1910.120 and 8CCR5192, respectively). The HASP addressed the potential for exposure to hazardous constituents, and delineated the general safety procedures that are required for the safe operation of mechanical equipment to be used while conducting field operations at the Site. A copy of the HASP is located in Appendix A.

3.1.2 Clearance of Underground Utilities

Underground Service Alert (USA) was notified, as required by law, 48 hours before any intrusive activities began. All boring locations were marked using wooden stakes or white paint, and USA members located utilities and other subsurface obstructions in the vicinity of the borings. In addition, all boring locations were cleared for underground utilities by Mr. Bob Lawrence, Maintenance Manager for Sunray Energy, Inc. Mr. Lawrence has been employed at the plant for over 15 years, and is very knowledgeable of the buried utilities present at the facility.

3.2 Soil Borings

Soil borings were advanced at 57 locations between December 2 – 6, 2008. One surface sample was also collected in the SEGS II Power Block. These sampling locations are illustrated in Figures 3 through 5. Sample collection is discussed below. Soil sampling procedures and protocols are described in Appendix B. Boring logs are located in Appendix C.

3.2.1 Soil Sample Nomenclature

Soil samples were identified based on their locations and depths. Soil samples were identified by area, as follows:

- SEGS I Parabolic Array: All samples in this area were prefixed by an "I" followed by the row and column where the sample was located, and followed by the depth of the sample in parentheses, such as I_17E (0-1);
- SEGS I Power Block: Samples prefixed by I_ET followed by the depth in parentheses, such as I_ET (0-1);
- SEGS I Fire Remediation Area: Samples were prefixed by I_FRA followed by the sample number and depth, such as I_FRA-2 (4-5);
- SEGS II Parabolic Array: Samples were prefixed by a II and followed by the array row and column, and the sample depth, such as II_14J (15-16);
- SEGS II Power Block: Samples were prefixed by II_PB and followed by the sample number and the depth, such as II_PB-1 (5-6);
- SEGS II Cooling Tower: Samples were prefixed with II_CT and followed by the sample number and the depth, such as II_CT-3 (10-11);
- Equipment Yard: Samples were prefixed with EY followed by the sample number and the depth, such as EY-4 (5-6);
- HTF Contaminated Soils Stockpiles: Samples were prefixed with I_SP or II_SP, depending on which array the stockpile was associated with, followed by the sample number and depth, such as I_SP-1 (0-1); and
- Therminol Disposal Area: Samples were prefixed with TDA followed by the sample number and depth, such as TDA-2 (0-1).

3.2.2 Collection of Soil Samples

Northgate utilized Interphase Environmental, Inc. of Los Angeles, California, for collection of the soil samples. Soil samples were collected using Geoprobe technology in clean acetate sleeves, which were driven into the ground at their respective sampling depths. Samples collected for analysis of VOCs, BTEX, and TPH-g were collected using EasyDraw Syringe™ and PowerStop Handle™ samplers and preserved at the Site in accordance with EPA Method 5035.

At the direction of Tetra Tech, soil cuttings generated during drilling and sampling activities were segregated and placed in the SEGS II stockpile area. Following sample collection, the borings were backfilled with hydrated amorphous bentonite chips.

The soil samples were held at the laboratory pending a request for analysis depending on field conditions. A discussion of analytical results is presented in Section 4.0. Soil sampling procedures and protocols are described in Appendix B.

3.3 Groundwater Sample Collection

On December 4, 2008 a groundwater sample (GW-1) was collected from the production well located in the SEGS I Power Block. On December 11, 2008 Northgate returned to the Site and collected an additional groundwater sample (GW-1-121108) because the analytical laboratory was not able to locate some of the bottles collected on December 4. Procedures and methods used to collect the two groundwater samples were identical. Sunray Energy also provided the same staff members on both dates to assist Northgate in performing the well purge and sample collection operations.

Although no well log or construction diagram was located by Sunray staff, previous reports for the Site reference five onsite groundwater production wells with a depth range of 300 to 400 feet, and depth to groundwater of 150 feet. The wells penetrate the regional aquifer system, and have been used historically to extract groundwater at an approximate amount of 111 and 440 acre feet per year (HIS Geotrans, 1997).

The well is completed with 7-inch diameter steel casing, and fitted with a production pump and discharge tubing. No sounding tube is present. Flow rate during pumping was measured at 81gallons per minute (gpm), by Layne Christensen in July, 2008. The water level in the production well could not be measured prior to collection of the water sample.

Construction details are not known for the well, but using a worst-case estimation of 150 feet of saturated screen; three well casing volumes would represent approximately 900 gallons of water. Prior to sampling the surge tank was bypassed, and water was allowed to discharge to the ground. The well was purged for 10 minutes and then stopped. The wellhead was fitted with sample collection tubing, and the well was purged an additional 5 minutes prior to collection of the groundwater sample. A portion of the flow was diverted at the wellhead through a 1-inch port into a section of ¼-inch polyethylene tubing to facilitate pressure drop and allow the sample stream to be placed slowly into the sampling bottles.

During purging the properties of pH, temperature, and specific conductance (SC) were measured in the produced water and recorded on the water sample data sheet. When the properties of pH, temperature, and SC stabilized to within 10% upon repeat measurements, and following the purging of three casing volumes, a groundwater sample was collected by filling the bottles directly

from the tubing. The flow was restricted during sample collection to decrease the flow rate and volume of water produced, and to prevent volatilization of organics within the produced water.

The groundwater samples were visibly free of suspended solids or turbidity, and had no detectable odor. Groundwater sampling procedures are located in Appendix B. The water sample data sheet is located in Appendix C. A discussion of groundwater analytical results is presented in Section 4.0.

4.0 ANALYTICAL METHODS

4.1 Soil Analysis

Summaries of the results of soil testing are located in Tables 1 through 3. Detailed laboratory analytical reports and chain-of-custody documents are located in Appendix D.

4.1.1 SEGS I Parabolic Array

A total of 64 soil samples were analyzed for TPH in the carbon range of C13 – C44 (TPH-cc, or extractable fuel hydrocarbons [EFH]) using U.S. Environmental Protection Agency (EPA) Method 8015M; for diphenyl oxide (1,1'-oxybisbenzene) and biphenyl (1,1'-biphenyl) using EPA Method 8015M; and for BTEX using EPA Method 8260B.

4.1.2 SEGS I Power Block

Three soil samples from the SEGS I Power Block were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for BTEX using EPA Method 8260B.

4.1.3 SEGS I Fire Remediation Area

Six soil samples from this area were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for SVOCs using EPA Method 8270C. Eight soil samples were analyzed for BTEX using EPA Method 8260B.

4.1.4 SEGS II Parabolic Array

Forty-seven soil samples from this area were analyzed for TPH-cc using EPA Method 8015M and for diphenyl oxide and biphenyl using EPA Method 8015M. Forty-six soil samples were analyzed for BTEX using EPA Method 8260B.

4.1.5 SEGS II Power Block

Four soil samples from the SEGS I Power Block were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for BTEX using EPA Method 8260B. One soil sample from the SEGS II Power Block was also analyzed for PCBs using EPA Method 8081.

4.1.6 SEGS II Cooling Tower

Nine samples from the SEGS II Cooling Tower were analyzed for pH using EPA Method 9045C.

4.1.7 Equipment Yard

Ten soil samples from the SEGS I Power Block were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for VOCs (including BTEX) using EPA Method 8260B. In addition, six of the samples were analyzed for TPH-gasoline range (TPH-g or GRO) and TPH-diesel range (TPH-d or DRO).

4.1.8 HTF Contaminated Soils Stockpiles

Nine soil samples from this area were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for BTEX using EPA Method 8260B.

4.1.9 Therminol Disposal Area

Four soil samples from this area were analyzed for TPH-cc using EPA Method 8015M; for diphenyl oxide and biphenyl using EPA Method 8015M; and for BTEX using EPA Method 8260B.

4.2 Groundwater Analysis

One groundwater sample was collected from the production well located in the SEGS I Power Block. The groundwater was analyzed for diphenyl oxide and biphenyl using EPA Method 3510C/8015B Modified, and for VOCs using EPA Method 8260B.

5.0 DISCUSSION AND RESULTS

Northgate collected 158 soil samples and 1 groundwater sample during the Site investigation. All soil and groundwater samples were submitted for analysis. Summaries of the results of soil and groundwater testing are located in Tables 1 through 4. Laboratory analytical reports and chain-of-custody documents are located in Appendix D. A discussion of the results is presented below.

5.1 Soil Results

In the SEGS I and SEGS II parabolic arrays, a total of 38 soil borings were installed at locations where oil-stained soils had been observed. Soil samples from the borings were analyzed to provide a depth-profile of the contamination, and obtain a clean confirmation sample below the impacted area. Using the analytical data and visual observations of stained soils obtained during drilling, the total volume of impacted soils at each boring location was estimated. Table 5 contains a listing of the observed depth of contamination, depth of the clean confirmation sample, the lateral area of the stained zone, and the estimated volume of contaminated soils present.

At 20 additional locations, soil samples were collected and analyzed to determine if historic activities had impacted Site soils. In some locations borings were placed in areas where stained soils were present; the remaining borings were placed in areas where no impacts were observed. One soil sample (II_PB-2) was collected in an area known to contain underground utilities by digging a shallow hole to access the soil. Table 5 contains a listing of the observed depth of contamination, depth of the clean confirmation sample, the lateral area of the stained zone, and the estimated volume of contaminated soils (where present).

5.1.1 SEGS I Parabolic Array

Sixty-four soil samples from 21 soil borings were analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX in the SEGS I Parabolic Array. Analytical results indicated that TPH-cc was detected in 30 soil samples at concentrations ranging from 5.9 milligrams per kilogram (mg/kg) to 28,000 mg/kg. The higher concentrations were generally in the shallower soil samples (0-1 foot bgs), indicating that concentrations of TPH-cc attenuate with depth.

No concentrations of biphenyl, diphenyl oxide, or BTEX were detected above laboratory detection limits in any of the samples from the SEGS I Parabolic Array.

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.2 SEGS I Power Block

One soil boring (with three soil samples) was advanced in the SEGS I Power Block during the investigation. The three soil samples were analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. TPH-cc was detected in one soil sample, I_ET (0-1), at a concentration of 350 mg/kg. No other analytes were detected above laboratory detection limits in the soil samples from this area.

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.3 SEGS I Fire Remediation Area

Three soil borings (a total of eight soil samples) were advanced in the SEGS I Fire Remediation Area. Six soil samples were analyzed for TPH-cc and diphenyl oxide/biphenyl, and eight soil samples were analyzed for BTEX and SVOCs. TPH-cc was detected in four soil samples at concentrations ranging from 7.6 mg/kg to 8,100 mg/kg. These concentrations attenuated with depth.

Toluene was detected in three soil samples at concentrations ranging from 3 micrograms per kilogram (µg/kg) to 4.9 µg/kg. Xylenes were detected in one soil sample at a concentration of 5.7 µg/kg. No other analytes were detected above laboratory detection limits.

Two SVOCs were detected in one soil sample each. Benzo(g,h,i)perylene was detected in sample I_FRA-1 (4-5) at a concentration of 1,700 µg/kg, and bis(2-ethylhexyl)phthalate was detected in sample I_FRA-1 (4-5) at a concentration of 640 µg/kg.

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1, and a summary of SVOC analytical results is located in Table 2. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.4 SEGS II Parabolic Array

Forty-seven soil samples from 17 soil borings were analyzed for TPH-cc and diphenyl oxide/biphenyl in the SEGS II Parabolic Array; 46 soil samples were analyzed for BTEX. TPH-cc was detected in 17 soil samples at concentrations ranging from 9.7 mg/kg to 25,000 mg/kg.

Shallow soil samples (0-1 foot bgs) generally yielded higher concentrations than deeper samples, indicating that TPH-cc concentrations attenuate with depth.

Diphenyl oxide was detected in 15 soil samples above laboratory detection limits. Concentrations of diphenyl oxide ranged from 2 mg/kg to 19,000 mg/kg. Biphenyl was detected in only one sample at a concentration of 400 mg/kg, but the detection limit for biphenyl was often raised significantly (up to 10,000 mg/kg) when diphenyl oxide was quantified in the sample; other samples may therefore contain biphenyl below laboratory reporting limits. Shallow soil samples (0-1 foot bgs) generally yielded higher concentrations of diphenyl oxide than deeper samples, indicating that concentrations attenuate with depth.

Concentrations of BTEX above laboratory reporting limits were reported in six soil samples at concentrations ranging from 2.6 µg/kg to 270 µg/kg. Benzene was reported in one soil sample (at 2.6 µg/kg); ethylbenzene was reported in six soil samples at concentrations ranging from 3.6 µg/kg to 270 µg/kg; toluene was reported in four soil samples at concentrations ranging from 3 µg/kg to 29 µg/kg; and xylenes were reported in four soil samples at concentrations ranging from 4.2 µg/kg to 13 µg/kg.

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.5 SEGS II Power Block

Four soil samples from the SEGS II Power Block were analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. TPH-cc was detected in the two shallow soil samples (0-1 foot bgs) at concentrations of 2,800 mg/kg and 12,000 mg/kg. Diphenyl oxide was detected in one soil sample (II_PB-1 (0-1)) at a concentration of 2,500 mg/kg. No other analytes were detected above laboratory detection limits.

One soil sample from the SEGS II power block was analyzed for PCBs. No PCBs were detected in that soil sample.

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.6 SEGS II Cooling Tower

Soil samples in three borings from the SEGS II Cooling Tower were analyzed for pH. pH ranged from 7.61 to 8.63 in the nine samples analyzed. pH analytical results are summarized in Table 3. Laboratory reports and COC forms are included in Appendix D.

5.1.7 Equipment Yard

Ten samples from five borings in the Equipment Yard were analyzed for TPH-cc, diphenyl oxide/biphenyl, and VOCs (including BTEX). In addition, six samples were analyzed for TPH-g and TPH-d. No VOCs were detected in any of the soil samples.

No TPH-g was detected in any of the soil samples above laboratory detection limits. TPH-d was detected in three shallow (0-1 foot bgs) soil samples at concentrations ranging from 100 mg/kg to 3,400 mg/kg.

TPH-cc was detected in five soil samples at concentrations ranging from 9.9 mg/kg to 22,000 mg/kg. Shallow soil samples (0-1 foot bgs) yielded higher concentrations than deeper samples, indicating that TPH-cc concentrations attenuate with depth.

Diphenyl oxide was detected in one soil sample, EY-1 (0-1), at a concentration of 110 mg/kg.

No other analytes were detected in the soil samples above laboratory detection limits.

A summary of analytical results for TPH-g, TPH-d, TPH-cc, diphenyl oxide/biphenyl, and VOCs is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.8 HTF Contaminated Soils Stockpiles

Nine soil samples from four soil borings advanced in the area of the HTF-contaminated soils stockpiles. All soil samples were analyzed for TPH-cc, diphenyl oxide/biphenyl, and BTEX. No analytes were detected above laboratory detection limits, with the exception of TPH-cc at a concentration of 85 mg/kg in soil sample I_SP-2 (0-1).

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.1.9 Therminol Disposal Area

Four soil samples from two soil borings in the Therminol Disposal Area were analyzed for TPG-cc, diphenyl oxide/biphenyl, and BTEX. No analytes were detected above laboratory detection limits, with the exception of toluene at a concentration of 4.2 µg/kg in sample TDA-2 (5-6).

A summary of analytical results for TPH-cc, diphenyl oxide/biphenyl, and BTEX is located in Table 1. Laboratory analytical reports and COC documentation are located in Appendix D.

5.2 Volume of Impacted Soil

Soil samples from the borings were analyzed to provide a depth-profile of the contamination, and obtain a clean confirmation sample below the impacted area. Using the analytical data (principally TPH-cc analytical data) and visual observations of stained soils obtained during drilling, the total volume of impacted soils at each boring location was estimated.

The depth of contamination was determined based on visual observations of stained soils at each boring location, as documented on the boring logs. The depth of visually stained soils from each boring log were used to calculate the volume of contaminated soils, along with the area of contamination observed on the ground surface, as presented in Table 5. The first soil sample below the stained soil horizon was considered to be the depth of the clean confirmation sample, unless analytical results determined that the soil sample at that location was impacted. In that case, the following soil sample was determined to be the clean confirmation sample.

A total of 38 areas were identified where TPH-cc was found to depths ranging from 1 to 16 feet bgs, for an estimated volume of 8,779 cubic yards of impacted material total. Table 5 contains a listing of the observed depth of contamination, depth of the clean confirmation sample, the lateral area of the stained zone, and the estimated volume of contaminated soils present.

5.3 Groundwater Results

One groundwater sample was obtained from the production well located in the SEGS I Power Block. With the exception of toluene, no VOCs or biphenyl/diphenyl oxide compounds were detected in the groundwater sample. Toluene was detected at a concentration of 0.65 ug/l in groundwater sample GW-1-121108. Groundwater analytical results are summarized in Table 4. Laboratory reports and COC forms are located in Appendix D.

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TABLES

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
SEGS I Parabolic Array												
I_12B (0-1)	0-1	12/05/08	--	--	**13,000**	<20	<20	<1.9	<1.9	<1.9	<3.9	--
I_12B (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_17B (0-1)	0-1	12/05/08	--	--	**4,800**	<8.0	<8.0	<1.9	<1.9	<1.9	<3.9	--
I_17B (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.2	--
I_17B (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.7	--
I_17E (0-1)	0-1	12/05/08	--	--	**17**	<2.0	<2.0	<1.7	<1.7	<1.7	<3.4	--
I_17E (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
I_17E (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.4	--
I_19E-1 (0-1)	0-1	12/02/08	--	--	**21,000**	<60	<60	<1.8	<1.8	<1.8	<3.6	--
I_19E-1 (5-6)	5-6	12/02/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.5	--
I_19E-1 (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.6	--
I_19E-2 (0-1)	0-1	12/02/08	--	--	**10,000**	<20	<20	<1.6	<1.6	<1.6	<3.3	--
I_19E-2 (5-6)	5-6	12/02/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
I_19E-2 (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<1.7	<1.7	<1.7	<3.3	--
I_20G (0-1)	0-1	12/02/08	--	--	**730**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_20G (5-6)	5-6	12/02/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
I_20G (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<1.7	<1.7	<1.7	<3.5	--
I_23 B (0-1)	0-1	12/03/08	--	--	**11,000**	<10	<10	<1.8	<1.8	<1.8	<3.5	--
I_23 B (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.6	--
I_23 B (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.2	--
I_23 B/C (0-1)	0-1	12/03/08	--	--	**4,400**	<10	<10	<1.8	<1.8	<1.8	<3.5	--
I_23 B/C (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
I_23 B/C (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_23C (0-1)	0-1	12/02/08	--	--	**8,500**	<20	<20	<1.6	<1.6	<1.6	<3.2	--
I_23C (5-6)	5-6	12/02/08	--	--	**26**	<2.0	<2.0	<2.0	<2.0	<2.0	<3.9	--
I_23C (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_24F-1 (0-1)	0-1	12/02/08	--	--	**16,000**	<20	<20	<1.7	<1.7	<1.7	<3.5	--
I_24F-1 (5-6)	5-6	12/02/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_24F-1 (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
I_24F-2 (0-1)	0-1	12/02/08	--	--	**15,000**	<20	<20	<1.8	<1.8	<1.8	<3.6	--
I_24F-2 (5-6)	5-6	12/02/08	--	--	**6.1**	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_24F-2 (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.7	--
I_28G-1 (0-1)	0-1	12/05/08	--	--	**520**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_28G-1 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_28G-1 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
I_28G-2 (0-1)	0-1	12/05/08	--	--	**3,400**	<8.0	<8.0	<2.3	<2.3	<2.3	<4.6	--
I_28G-2 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_28G-2 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
I_29H (0-1)	0-1	12/05/08	--	--	**27,000**	<40	<40	<1.7	<1.7	<1.7	<3.4	--
I_29H (5-6)	5-6	12/05/08	--	--	**7.3**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_29H (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.4	<2.4	<2.4	<4.8	--
I_36 B (0-1)	0-1	12/03/08	--	--	**25,000**	<100	<100	<1.7	<1.7	<1.7	<3.3	--
I_36 B (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.3	--
I_36 B (10-11)	10-11	12/03/08	--	--	**34**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_4B (0-1)	0-1	12/05/08	--	--	**17,000**	<20	<20	<2.0	<2.0	<2.0	<4.0	--
I_4B (5-6)	5-6	12/05/08	--	--	**5.9**	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
I_4B (10-11)	10-11	12/05/08	--	--	**32**	<2.0	<2.0	<2.0	<2.0	<2.0	<4.1	--
I_4B (15-16)	15-16	12/05/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
I_55E (0-1)	0-1	12/03/08	--	--	**18**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
I_55E (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.7	--
I_55E (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
I_61 F-1 (0-1)	0-1	12/05/08	--	--	**16,000**	<16	<16	<1.6	<1.6	<1.6	<3.2	--
I_61 F-1 (5-6)	5-6	12/05/08	--	--	**16,000**	<16	<16	<1.9	<1.9	<1.9	<3.9	--
I_61 F-1 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_61 F-2 (0-1)	0-1	12/05/08	--	--	**28,000**	<80	<80	<1.7	<1.7	<1.7	<3.3	--
I_61 F-2 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.8	<2.8	<2.8	<5.5	--
I_61 F-2 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<3.2	<3.2	<3.2	<6.5	--
I_73D (0-1)	0-1	12/03/08	--	--	**23,000**	<100	<100	<1.6	<1.6	<1.6	<3.1	--
I_73D (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<1.7	<1.7	<1.7	<3.5	--

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
I_73D (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
I_73D (15-16)	15-16	12/03/08	--	--	**130**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
I_81E (0-1)	0-1	12/03/08	--	--	**7,600**	<10	<10	<1.9	<1.9	<1.9	<3.7	--
I_81E (5-6)	5-6	12/03/08	--	--	**630**	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
I_81E (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.4	--
SEGS I Power Block												
I_ET (0-1)	0-1	12/02/08	--	--	**350**	<2.0	<2.0	<1.8	<1.8	<1.8	<3.7	--
I_ET (4-5)	4-5	12/02/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
I_ET (10-11)	10-11	12/02/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
SEGS I Fire Remediation Area												
I_FRA-1 (4-5)	4-5	12/02/08	--	--	**6,500**	<20	<20	<1.9	<1.9	**3**	**5.7**	--
I_FRA-1 (9-10)	9-10	12/02/08	--	--	**7.6**	<2.0	<2.0	<2.1	<2.1	<2.1	<4.3	--
I_FRA-2 (4-5)	4-5	12/02/08	--	--	<5.0	<2.0	<2.0	<2.5	<2.5	<2.5	<5.1	--
I_FRA-2 (9-10)	9-10	12/02/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
I_FRA-2 (14-15)	14-15	12/02/08	--	--	--	--	--	<1.6	<1.6	<1.6	<3.2	--
I_FRA-2 (19-20)	19-20	12/02/08	--	--	--	--	--	<2.0	<2.0	<2.0	<4.0	--
I_FRA-3 (4-5)	4-5	12/02/08	--	--	**8,100**	<20	<20	<1.8	<1.8	**4.5**	<3.6	--
I_FRA-3 (9-10)	9-10	12/02/08	--	--	**580**	<10	<10	<1.9	<1.9	**4.9**	<3.8	--
SEGS II Parabolic Array												
II_10I (0-1)	0-1	12/04/08	--	--	**14**	<2.0	<2.0	<1.7	<1.7	<1.7	<3.4	--
II_10I (5-6)	5-6	12/04/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
II_10I (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
II_14J (0-1)	0-1	12/04/08	--	--	**6,400**	<4000	**8,600**	<1.7	**160**	**29**	**13**	--
II_14J (5-6)	5-6	12/04/08	--	--	**5,100**	<2000	**3,100**	<1.9	**30**	**3**	**4.2**	--
II_14J (10-11)	10-11	12/04/08	--	--	**6,900**	<2000	**4,400**	<2.0	**88**	**8.8**	**7.6**	--
II_14J (15-16)	15-16	12/04/08	--	--	**10**	<2.0	**3.5**	<2.0	<2.0	<2.0	<4.0	--
II_14J (19-20)	19-20	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
II_1P (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
II_1P (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.5	--
II_1R (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<4.5	<4.5	<4.5	<9.0	--

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
II_1R (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.2	--
II_21I-1 (0-1)	0-1	12/04/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.1	--
II_21I-1 (5-6)	5-6	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
II_21I-2 (0-1)	0-1	12/04/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.2	--
II_21I-2 (5-6)	5-6	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
II_21O (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.3	--
II_21O (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.2	--
II_23Q (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<3.5	<3.5	<3.5	<6.9	--
II_23Q (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
II_27A (0-1)	0-1	12/04/08	--	--	**24**	<2.0	**2**	<1.6	<1.6	<1.6	<3.2	--
II_27A (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
II_27H (0-1)	0-1	12/04/08	--	--	**2,700**	**400**	**1,100**	<1.6	<1.6	<1.6	<3.2	--
II_27H (5-6)	5-6	12/04/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.3	--
II_27H (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.2	--
II_31A (0-1)	0-1	12/04/08	--	--	**10,000**	<2000	**5,700**	<1.6	**3.6**	<1.6	<3.2	--
II_31A (5-6)	5-6	12/04/08	--	--	**7,600**	<2000	**5,800**	<1.8	<1.8	<1.8	<3.5	--
II_31A (10-11)	10-11	12/04/08	--	--	**81**	<20	**72**	<1.9	<1.9	<1.9	<3.9	--
II_31A (15-16)	15-16	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
II_36K (0-1)	0-1	12/04/08	--	--	**25,000**	<6000	**12,000**	**2.6**	**270**	**25**	**13**	--
II_36K (5-6)	5-6	12/04/08	--	--	**9,500**	<2000	**2,500**	<1.8	<1.8	<1.8	<3.6	--
II_36K (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
II_36K (15-16)	15-16	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
II_37H (0-1)	0-1	12/04/08	--	--	**10,000**	<4000	**8,400**	<1.6	<1.6	<1.6	<3.2	--
II_37H (5-6)	5-6	12/04/08	--	--	**20,000**	<8000	**19,000**	<1.7	**25**	<1.7	<3.4	--
II_37H (9-10)	9-10	12/04/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
II_39D (0-1)	0-1	12/04/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.5	--
II_39D (5-6)	5-6	12/04/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.1	--
II_39D (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<1.6	<1.6	<1.6	<3.2	--
II_40K (0-1)	0-1	12/03/08	--	--	**9.7**	<2.0	**5.1**	<2.1	<2.1	<2.1	<4.2	--
II_40K (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.6	--

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
II_40K (10-11)	10-11	12/03/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.8	--
II_5G (0-1)	0-1	12/04/08	--	--	**22,000**	<10000	**16,000**	--	--	--	--	--
II_5G (5-6)	5-6	12/04/08	--	--	**5.1**	<2.0	<2.0	<1.7	<1.7	<1.7	<3.4	--
II_5G (10-11)	10-11	12/04/08	--	--	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.2	--
II_87T (0-1)	0-1	12/03/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
II_87T (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.6	--
SEGS II Power Block												
II_PB-1 (0-1)	0-1	12/05/08	--	--	**12,000**	<2000	**2,500**	<1.9	<1.9	<1.9	<3.8	--
II_PB-1 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.5	--
II_PB-1 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.3	<2.3	<2.3	<4.5	--
II_PB-2 (0-0.5)	0-0.5	12/05/08	--	--	**2,800**	<8.0	<8.0	<1.8	<1.8	<1.8	<3.5	--
Equipment Yard												
EY-1 (0-1)	0-1	12/03/08	--	--	**150**	<40	**110**	<1.7	<1.7	<1.7	<3.4	ND
EY-1 (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.4	ND
EY-2 (0-1)	0-1	12/03/08	<0.39	**1,600**	**13,000**	<20	<20	<1.8	<1.8	<1.8	<3.6	ND
EY-2 (5-6)	5-6	12/03/08	<0.42	<5.0	<5.0	<2.0	<2.0	<2.1	<2.1	<2.1	<4.2	ND
EY-3 (0-1)	0-1	12/03/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	ND
EY-3 (5-6)	5-6	12/03/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.4	ND
EY-4 (0-1)	0-1	12/03/08	<0.36	**100**	**140**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	ND
EY-4 (5-6)	5-6	12/03/08	<0.45	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	ND
EY-5 (0-1)	0-1	12/03/08	<0.34	**3,400**	**22,000**	<50	<50	<1.7	<1.7	<1.7	<3.4	ND
EY-5 (5-6)	5-6	12/03/08	<0.32	<5.0	**9.9**	<2.0	<2.0	<1.7	<1.7	<1.7	<3.4	ND
HTF Contaminated Soils Stockpiles												
I_SP-1 (0-1)	0-1	12/05/08	--	--	<5.0	<2.0	<2.0	<1.8	<1.8	<1.8	<3.6	--
I_SP-1 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	<1.9	<3.7	--
I_SP-2 (0-1)	0-1	12/05/08	--	--	**85**	<2.0	<2.0	<1.9	<1.9	<1.9	<3.9	--
I_SP-2 (5-6)	5-6	12/05/08	--	--	<5.0	<2.0	<2.0	<1.7	<1.7	<1.7	<3.3	--
I_SP-2 (10-11)	10-11	12/05/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.5	--
II_SP-1 (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.9	--
II_SP-1 (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.9	--

Table 1.

Summary of Soil Sample Analytical Results for TPH and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8015B Modified (mg/kg)		EPA Method 8015 Modified (mg/kg)			EPA Method 8260B (µg/kg)				
			GRO (C4 - C12)	DRO (C13 - C22)	EFH (C13 - C44)	1,1'-Biphenyl	1,1'-Oxybisbenzene	Benzene	Ethyl-benzene	Toluene	Xylenes, Total	All Other VOCs
II_SP-2 (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<3.2	<3.2	<3.2	<6.4	--
II_SP-2 (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.0	--
Therminol Disposal Area												
TDA-1 (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<4.1	--
TDA-1 (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<2.5	<2.5	<2.5	<5.0	--
TDA-2 (0-1)	0-1	12/06/08	--	--	<5.0	<2.0	<2.0	<2.2	<2.2	<2.2	<4.4	--
TDA-2 (5-6)	5-6	12/06/08	--	--	<5.0	<2.0	<2.0	<1.9	<1.9	**4.2**	<3.8	--

TPH = total petroleum hydrocarbons
VOCs = volatile organic compounds
ft bgs = feet below ground surface
EPA = Environmental Protection Agency
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
GRO = gasoline range organics
DRO = diesel range organics
EFH = extractable fuel hydrocarbons
-- = Not analyzed for
< = Not detected above laboratory reporting limit indicated
Note: VOCs shown for selected compounds only including all compounds detected above laboratory reporting limits.
See laboratory reports for a complete list of compounds analyzed for.

Table 2.

Summary of Soil Sample Analytical Results for SVOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth (ft bgs)	Sample Date	EPA Method 8270C (µg/kg)		
			Benzo(g,h,i)perylene	Bis(2-ethylhexyl)phthalate	All Other SVOCs
I_FRA-1 (4-5)	4-5	12/02/08	**1,700**	<1300	ND
I_FRA-1 (9-10)	9-10	12/02/08	<330	<330	<330
I_FRA-2 (4-5)	4-5	12/02/08	<330	<330	<330
I_FRA-2 (9-10)	9-10	12/02/08	<330	<330	<330
I_FRA-3 (4-5)	4-5	12/02/08	<2600	<2600	<2600
I_FRA-3 (9-10)	9-10	12/02/08	<330	**640**	<330

SVOCs = semivolatile organic compounds

ft bgs = feet below ground surface

EPA = Environmental Protection Agency

µg/kg = micrograms per kilogram

< = not detected above laboratory reporting limit indicated

ND = Not detected

Note: SVOCs are shown for detected compounds only, see laboratory reports for a complete list of compounds analyzed for.

Table 3.

Summary of Soil Sample Analytical Results for pH

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Depth	Sample Date	EPA Method 9045C		
			Analyte	Result	Units
II_CT-1 (0-1)	0-1	12/04/08	pH	7.61	pH Units
II_CT-1 (5-6)	5-6	12/04/08	pH	8.14	pH Units
II_CT-1 (10-11)	10-11	12/04/08	pH	7.80	pH Units
II_CT-2 (0-1)	0-1	12/04/08	pH	8.26	pH Units
II_CT-2 (5-6)	5-6	12/04/08	pH	8.01	pH Units
II_CT-2 (10-11)	10-11	12/04/08	pH	8.05	pH Units
II_CT-3 (0-1)	0-1	12/04/08	pH	8.63	pH Units
II_CT-3 (5-6)	5-6	12/04/08	pH	7.87	pH Units
II_CT-3 (10-11)	10-11	12/04/08	pH	8.17	pH Units

ft bgs = feet below ground surface

EPA = Environmental Protection Agency

Table 4.

Summary of Groundwater Sample Analytical Results for TPH (quantified as Biphenyl Oxybisbenzene) and VOCs

Solar Energy Generating System 1 and 2

Daggett, California

Sample Name	Sample Date	EPA Method 8015B (mg/L)		EPA Method 8260B (µg/L)					
		1,1'-Biphenyl	1,1'-Oxybisbenzene	MTBE	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene
GW-1	12/04/08	<0.097	<0.097	--	--	--	--	--	--
GW-1-121108	12/11/08	--	--	<1.0	<0.50	**0.65**	<0.50	<1.0	<0.50

Table 5
Estimated Volume of Contaminated Soils
Solar Energy Generating System 1 and 2
Daggett, California

Project Area	Description	Location	Materials Potentially Released	Analytical Parameters	Boring ID	Sample Intervals	Depth of Clean Confirmation Sample	Depth of Contamination	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)
SEGS I Power Block	15 ft x 4 ft soil stain near rubber piping and pump	South of Caloria expansion tank system/slab	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_ET	0-1, 5-6, 10-11 fbls	10	5.5	60.0	330.0	12.2
SEGS I Parabolic Array	5 ft x 20 ft soil stain oriented east/west below flex line	South side between rows 29 H and 30 H	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_29H	0-1, 5-6, 10-11 fbls	10	6	100.0	600.0	22.2
	48 ft x 30 ft dark soil stain between two rows of mirrors	Between rows 27 G and 28 G	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_28G-1 I_28G-2	0-1, 5-6, 10-11 fbls	10	5	1440.0	7200.0	266.7
	90 ft x 30 ft dark soil stain between two rows of mirrors	Between rows 24 F and 25 F	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_24F-1 I_24F-2	0-1, 5-6, 10-11 fbls	10	8.5	2700.0	22950.0	850.0
	75 ft x 30 ft soil stain below mirrors and in isle	Along rows 19 E and 19 F	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_19E-1 I_19E-2	0-1, 5-6, 10-11 fbls	10	8	2250.0	18000.0	666.7
	60 ft x 5 ft soil stain with a northern section measuring 10 ft x 30 ft	Below row 20 G	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_20G	0-1, 5-6, 10-11 fbls	10	9	600.0	5400.0	200.0
	45 ft x 20 ft soil stain under mirrors and in isle	Extending across rows 17 E and 17 F	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_17E	0-1, 5-6, 10-11 fbls	10	5	900.0	4500.0	166.7
	10 ft dia. Soil stain around concrete foundation – below flex line	Between rows 4 B and 4 C	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_4B	0-1, 5-6, 10-11, 15-16 fbls	10	7.5	78.5	588.8	21.8
	15 ft dia. Soil stain below mirrors	Row 12 B	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_12B	0-1, 5-6 fbls	5	2	176.6	353.3	13.1
	20 ft dia. (old) soil stain below mirrors – soil appears to have been previously removed in this area	Row 17 B	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_17B	0-1, 5-6, 10-11 fbls	10	5	314.0	1570.0	58.1
	20 ft x 6 ft soil stain near control box	Row 23 B	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_23B	0-1, 5-6, 10-11 fbls	10	5	120.0	600.0	22.2
	40 ft long by 10 to 20 ft wide soil stain below mirrors	Between rows 23 B to 23 C	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_23B/C	0-1, 5-6, 10-11 fbls	10	7.5	800.0	6000.0	222.2

Table 5

Estimated Volume of Contaminated Soils

Solar Energy Generating System 1 and 2

Daggett, California

Project Area	Description	Location	Materials Potentially Released	Analytical Parameters	Boring ID	Sample Intervals	Depth of Clean Confirmation Sample	Depth of Contamination	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)
	10 ft x 8 ft soil stain below mirrors	Row 23 C	Therminol VP-I or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_23C	0-1, 5-6, 10-11 fbls	10	8	80.0	640.0	23.7
	21 ft x 5 ft light colored soil stain below mirrors	Row 36 B	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_36B	0-1, 5-6, 10-11 fbls	10	7.8	105.0	819.0	30.3
	10 ft x 8 ft soil stain below header pipe	South end of row 73 D	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_73D	0-1, 5-6, 10-11, 15-16 fbls	15	12	80.0	960.0	35.6
	26 ft x 20 ft soil stain below flex line drain with shortened 55 gallon drum below drain	Between Rows 55 E and 55 F	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_55E	0-1, 5-6, 10-11 fbls	10	8	520.0	4160.0	154.1
	45 ft x 40 ft soil stain extending across two rows of mirrors	Across rows 61E/61 F and 62 E/62 F	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_61F-1 I_61F-2	0-1, 5-6, 10-11 fbls	10	8	1800.0	14400.0	533.3
	8 ft dia soil stain at base of upright around concrete foundation	North side of row 81 E	Therminol VP-1 or Caloria	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_81E	0-1, 5-6, 10-11 fbls	10	7	50.2	351.7	13.0
SEGS II Power Block	3 ft x 1.5 ft soil stain below PCB transformer cooling fins. No leak was identified from the transformer.	North side of transformer S/N: SEW7439-0101	Unknown – possibly Wecosol.	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl.	II_PB-2	0-1					
	Soil staining extending beyond concrete pad under 750K gal. Therminol AST vapor release system.	At, around, and beyond two 55 gallon drums with piping on north east corner of 750K gal Therminol AST	Therminol ~ >10 gallons	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_PB-1	0-1, 10-11 fbls	10	4	200.0	800.0	29.6
	Stained soil extending 6 ft beyond compressor	At and around green compressor	Unknown – possibly Therminol or other Petroleum products	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	no sample taken						
SEGS II Cooling Tower	White crust and 50 ft x 100 ft soil stain originating from breached secondary containment where a corrosive tank was stored.	East of cooling tower	Acid/corrosives ~> 55 gal.	pH	II_CT-1 II_CT-2 II_CT-3	0-1, 5-6, 10-11 fbls	5	0			
SEGS II Parabolic Array	12 ft dia light soil stain in the middle of the isle	Row 23 Q	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_23Q	0-1, 5-6 fbls	5	2.5	113.0	282.6	10.5

Table 5
Estimated Volume of Contaminated Soils
Solar Energy Generating System 1 and 2
Daggett, California

Project Area	Description	Location	Materials Potentially Released	Analytical Parameters	Boring ID	Sample Intervals	Depth of Clean Confirmation Sample	Depth of Contamination	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)
	10 ft dia soil stain around upright concrete foundation	Row 21 O	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_21O	0-1, 5-6 fbls	5	2.5	78.5	196.3	7.3
	30 ft x 20 ft soil stain at end of mirror row	SW of the south side of Row I	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_1R	0-1, 5-6 fbls	5	3.5	600.0	2100.0	77.8
	Two 45 ft x 15 ft soil stains in open area	Between SEGS II cooling tower and power block, west of row 1 P	Therminol VP-I	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_1P	0-1, 5-6 fbls	5	1.5	1350.0	2025.0	75.0
	8 ft dia soil stain round upright concrete foundation	South end of 37 H	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_37H	0-1, 5-6, 10-11 fbls	10	8	50.2	401.9	14.9
	Odorous 10 ft dia soil stain, below a control box and at base of upright	Row 27 H	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_27H	0-1, 5-6, 10-11 fbls	10	6.5	78.5	510.3	18.9
	Soil stain 30 ft wide and extending across 6 rows of mirrors	Rows 18 I through row 22 I	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_21I-1 II_21I-2	0-1, 5-6 fbls	5	2.5	1800.0	4500.0	166.7
	Odorous 8 ft dia soil stain below flex line	South end of Rows 9 I and 10 I	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_10I	0-1, 5-6, 10-11 fbls	10	6.5	50.2	326.6	12.1
	Dark 5 ft dia soil stain at base of upright around concrete foundation and 15 ft x 4 ft light soil stain across isle	Row 5 G	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_5G	0-1, 5-6, 10-11 fbls	10	9	78.5	706.5	26.2
	41 ft x 23 ft soil stain across two rows of mirrors	Rows 38 D and 39 D	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_39D	0-1, 5-6, 10-11 fbls	10	6.8	943.0	6412.4	237.5
	Soil stain extending 6 ft beyond base of upright around concrete foundation	Between rows 31 A and 31 B	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_31A	0-1, 5-6, 10-11, 15-16 fbls	15	10.5	113.0	1186.9	44.0
	21 ft x 14 ft light soil stain originating at flex line and base of upright around concrete foundation extending into isle	Row 27 A	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_27A	0-1, 10-11 fbls	10	4	294.0	1176.0	43.6

Table 5
Estimated Volume of Contaminated Soils
Solar Energy Generating System 1 and 2
Daggett, California

Project Area	Description	Location	Materials Potentially Released	Analytical Parameters	Boring ID	Sample Intervals	Depth of Clean Confirmation Sample	Depth of Contamination	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)
	12 ft dia soil stain at base of upright around concrete foundation	North side of 40 K	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_40K	0-1, 5-6, 10-11 fbls	10	6.5	113.0	734.8	27.2
	12 ft dia soil stain below valve	South side of 36 K	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_36K	0-1, 5-6, 10-11, 15-16 fbls	15	14	113.0	1582.6	58.6
	17 ft x 11 ft Soil stain below flex line drain	Row 16 J	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_14J	0-1, 5-6, 10-11, 15-16, 19-20 fbls	15	12.8	187.0	2393.6	88.7
	27 ft x 18 ft soil stain between two rows	Between rows 97 S/97 T and 98 S/98 T	Therminol VP-1	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	II_87T	0-1, 5-6 fbls	5	2.5	486.0	1215.0	45.0
Equipment Yard	Light 15 ft dia. Soil stain	Off the SW corner of the southern central pile of flex lines in	HTF – either Therminol or Caloria or both	TPH (C15-C50), diphenyl oxide/biphenyl	EY-1	0-1, 5-6 fbls	5	3.5	176.6	618.2	22.9
	Three soil stains, the largest is a 15 ft x 5 ft soil stain originating from 55 gal drum storage pad	SE corner of equipment yard along drum storage pad. The largest stain is on north end of N-S oriented drum storage pad	Petroleum products – motor oil, gear oil, or ATF.	TPH (C15-C50), diphenyl oxide/biphenyl, 8015 gas, 8015 diesel, VOCs	EY-2	0-1, 5-6 fbls	5	1	75.0	75.0	2.8
	8 ft dia soil stain below crushed/refuse drum dumpster	Below green dumpster north west of the northern most	HTF – either Therminol or Caloria or both	TPH (C15-C30), diphenyl oxide/biphenyl	EY-3	0-1, 5-6 fbls	1	0			
	Dark soil stain extending 7 ft beyond unlabeled drum	NE corner of inner fenced section of equipment yard	Unknown drum contents, spill <55 gal.	TPH (C15-C50), diphenyl oxide/biphenyl, 8015 gas, 8015 diesel, VOCs	EY-4	0-1, 5-6 fbls	5	1	153.9	153.9	5.7
	Seven soil stains below equipment parked along western boarder of equipment yard. Stains are dark to very dark and varied in size from 4 ft dia to 10 ft x 6 ft.	Equipment parking area along the western boarder of the equipment yard below a bobcat, earth mover, dump truck, water truck and open areas.	Various petroleum products associated with heavy equipment	TPH (C15-C50), diphenyl oxide/biphenyl, 8015 gas, 8015 diesel, VOCs	EY-5	0-1, 5-6, 10-11 fbls	5	1	201.0	201.0	7.4
		Therminol Disopsal Area	Therminol	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	TDA-1 TDA-2	0-1, 5-6 fbls	5	0			

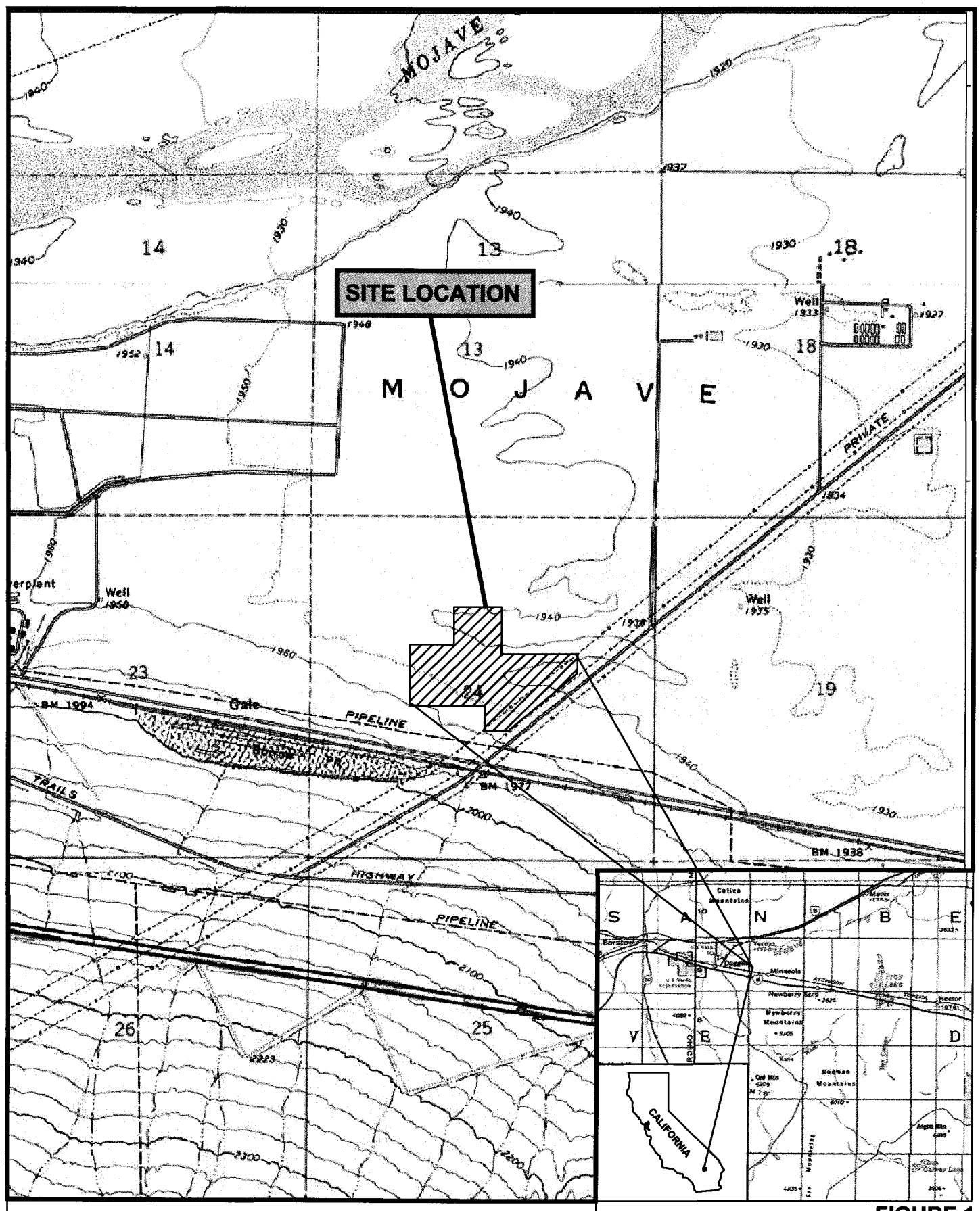
Table 5

Estimated Volume of Contaminated Soils

Solar Energy Generating System 1 and 2

Daggett, California

Project Area	Description	Location	Materials Potentially Released	Analytical Parameters	Boring ID	Sample Intervals	Depth of Clean Confirmation Sample	Depth of Contamination	Estimated Lateral Area of Stained Zone (square feet)	Estimated Volume of Contamination (cubic feet)	Estimated Volume of Contamination (cubic yards)
		HTF contaminated area	HTF – either Therminol or Caloria or both	BTEX, TPH (C15-C50), diphenyl oxide/biphenyl	I_SP-1 I_SP-2 II_SP-1	0-1, 5-6 1 fbls also 10-11	5	0			
		SEGS 1 Remediation Area		BTEX, TPH (C15-C50), diphenyl oxide/biphenyl, SVOCs	I_FRA-1 I_FRA-2 I_FRA-3	4-5, 9-10, 14-15, 19-20 fbls	9	8	15000.0	120000.0	4444.4
										Total Volume of Contamination (cubic yards)	**8778.6**



Scale

1000 0 1000 2000 3000 Feet

1" = 2,000'

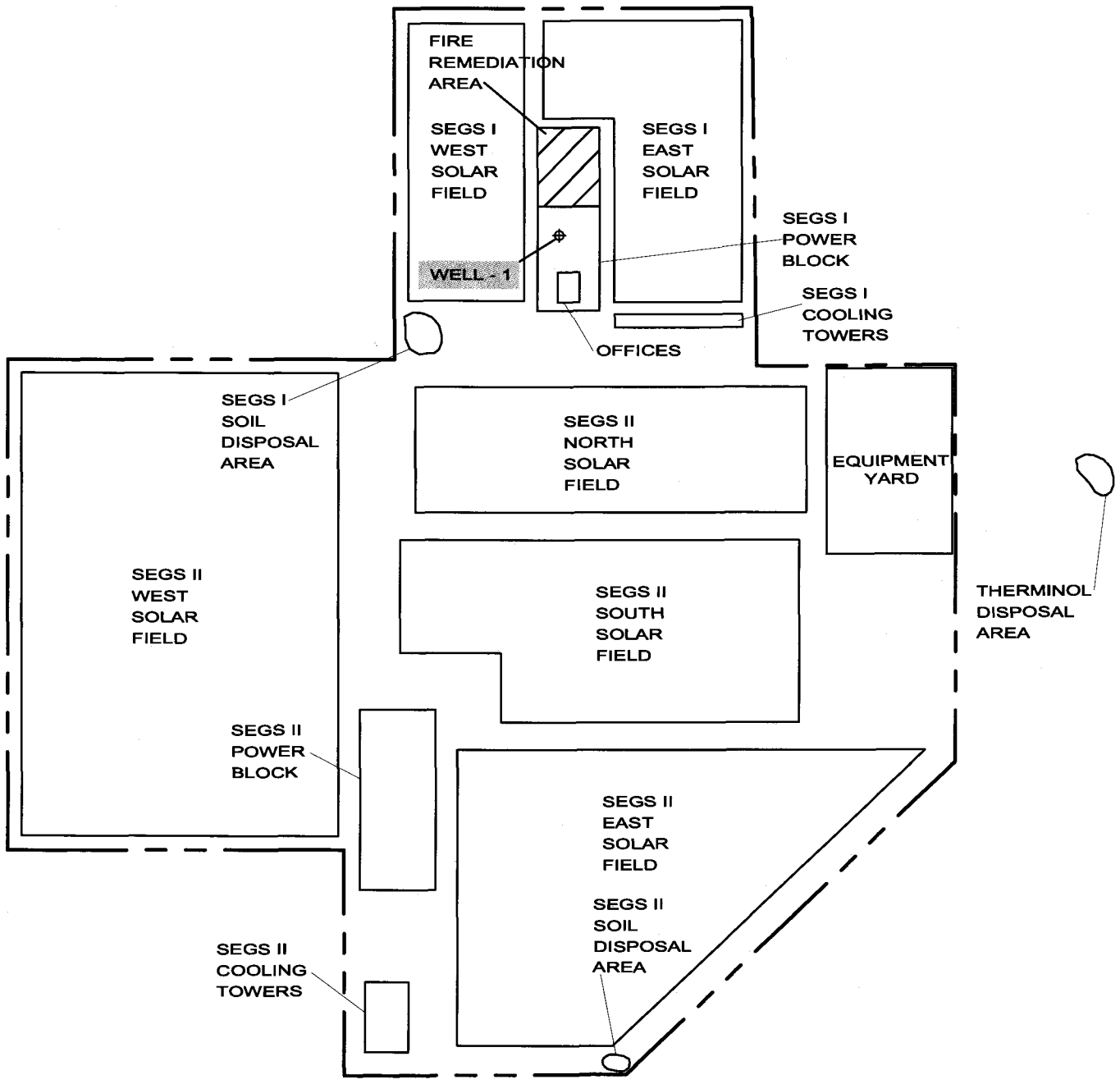
Source: National Geographic 2008

FIGURE 1
Site Location Map

SEGS I and II
35100 Santa Fe Road
Daggett, California

northgate
environmental management, inc.

Project No. 2024.01



LEGEND

SITE BOUNDARY

Production Well

Well #1

Fire Remediation Area

N

Scale 0 150 ft

1" = 150'

FIGURE 2
Site Map

SEGS I and I
35100 Santa Fe Road
Daggett, California

northgate
environmental management, inc.

Project No. 2024.01

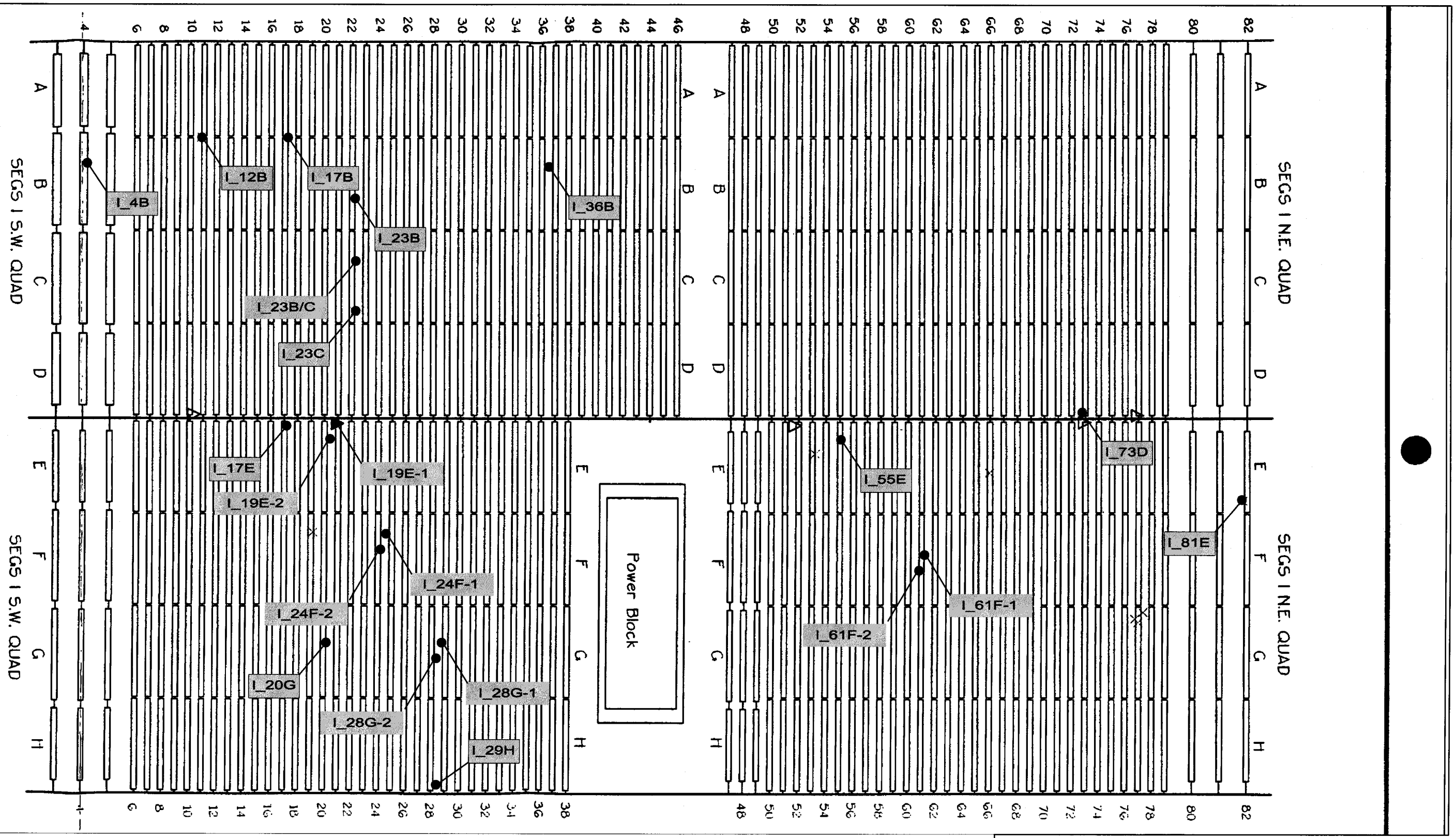
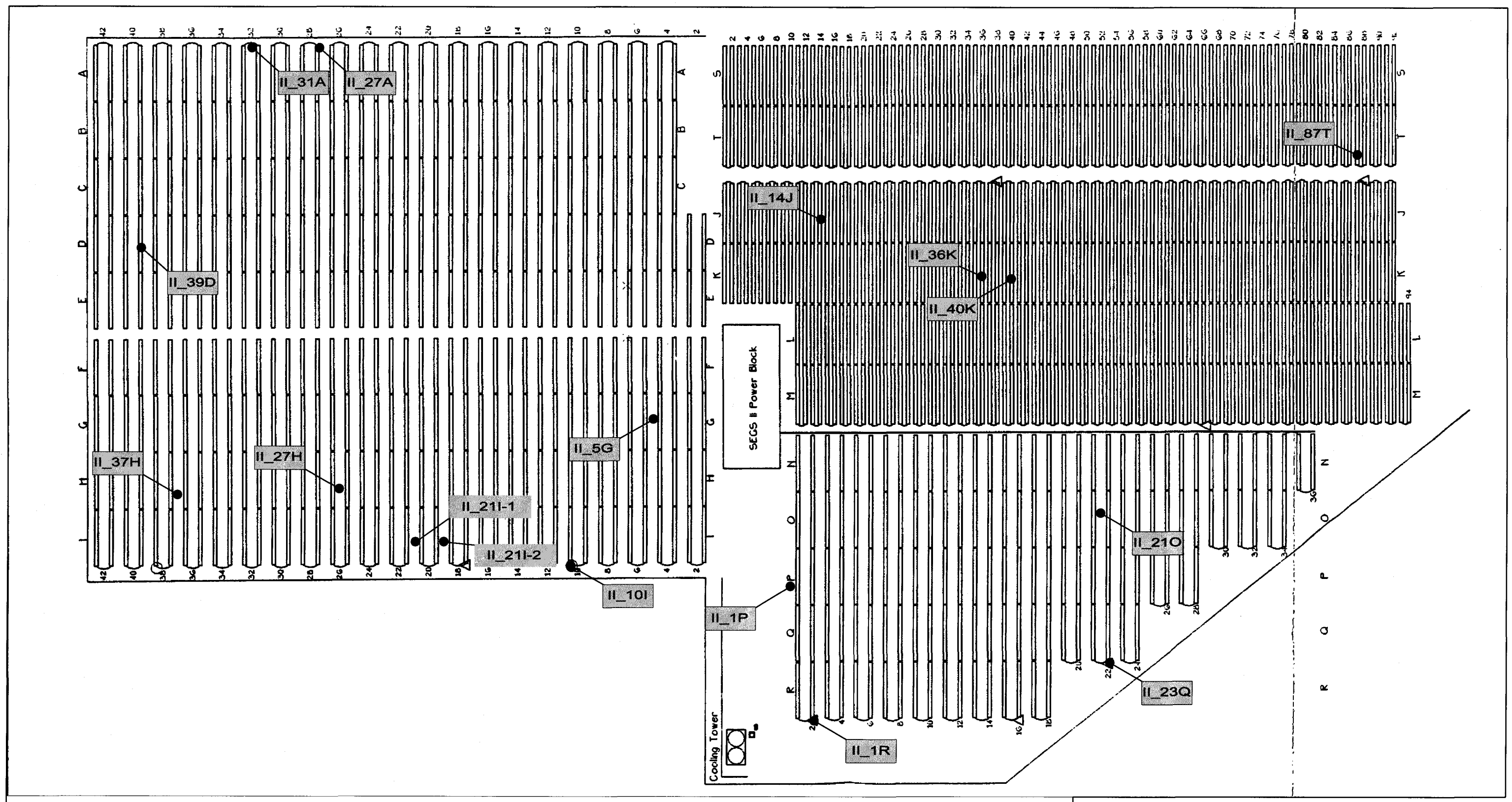


FIGURE 3
SEGS I Parabolic Array Map

northgate
environmental management, inc.

SEGS I and II
35100 Santa Fe Road
Daggett, California

Project No. 2024.01



Legend

Soil Boring Location

II_21I-2

0 150 300

Scale 1" = 300'

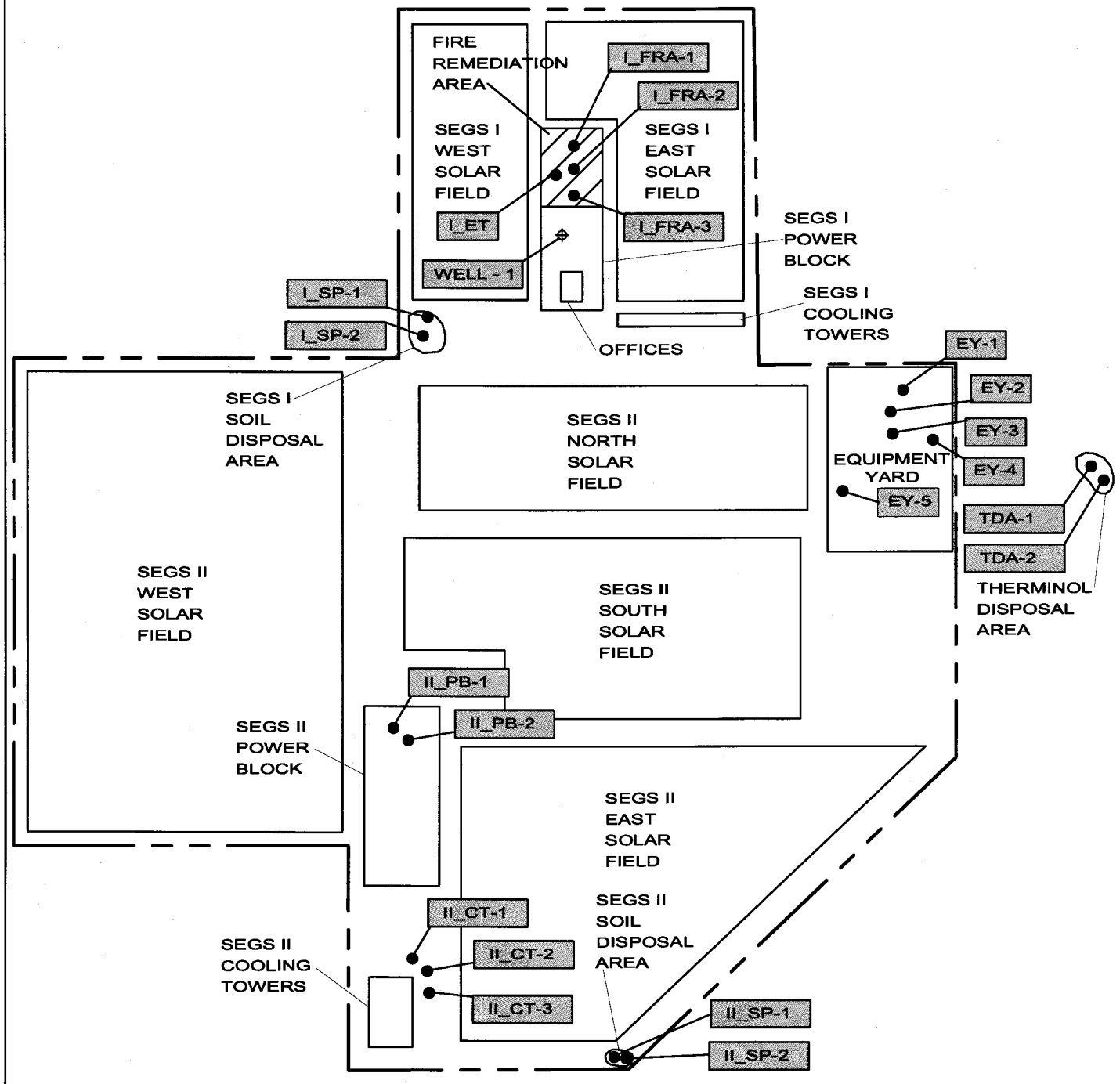
N

FIGURE 4
SEGS II Parabolic Array Map

SEGS I and II
35100 Santa Fe Road
Daggett, California

Project No. 2024.01

northgate
environmental management, inc.



LEGEND

SITE BOUNDARY

Production Well

Well #1

Soil Boring Location

II_CT-1

N

Scale

0 150 ft

1" = 150'

FIGURE 5
Soil Boring Locations

SEGS I and I
35100 Santa Fe Road
Daggett, California

northgate
environmental management, inc.

Project No. 2024.01

APPENDIX A
HEALTH AND SAFETY PLAN

Health and Safety Plan
for Investigation Activities at the
Solar Energy Generating Systems (SEGS) 1 & 2 Site
Daggett, California

December 1, 2008
2024.01

CONTENTS

APPENDICES

1.0 GENERAL

Northgate Environmental Management (Northgate) has prepared this Health and Safety Plan (HSP) for use during the investigation/excavation activities to be conducted at the Solar Energy Generating System (SEGS) 1 & 2 Site located at 35100 Santa Fe Street in Daggett, California ("the Site"). Activities conducted under NORTHGATE's direction at the Site will be in compliance with applicable Occupational Safety and Health Administration (OSHA) regulations, particularly those in Title 8 California Code of Regulations (CCR) 5192, and other applicable federal, state, and local laws, regulations, and statutes. A copy of this HSP will be kept on site during scheduled field activities.

This HSP addresses the potential hazards associated with planned field activities at the Site. It presents the minimum health and safety requirements for establishing and maintaining a safe working environment during the course of work. In the event of conflicting requirements, the procedures or practices that provide the highest degree of personnel protection will be implemented. If work plan specifications change or if site conditions encountered during the course of the work are found to differ substantially from those anticipated, the Director of Health and Safety must be informed immediately upon discovery, and appropriate changes will be made to this HSP.

It is the Project Manager's responsibility to ensure that health and safety procedures are enforced at the Site. Project personnel, including subcontractors, shall receive a copy of this HSP and sign the form to indicate acceptance before on-site project activities begin.

NORTHGATE's health and safety programs and procedures, including medical monitoring, respiratory protection, injury and illness prevention, hazard communication, and personal protective equipment (PPE), are documented in the NORTHGATE Corporate Health and Safety Manual. These health and safety procedures are incorporated herein by reference, and NORTHGATE employees will adhere to the procedures specified in the manual.

When specified in contract documents, this HSP may cover the activities of NORTHGATE subcontractors. However, this HSP may not address hazards associated with tasks and equipment that are specialties of the subcontractor (e.g., operation of a drill rig). Subcontractors are responsible for developing, maintaining, and implementing their own health and safety programs, policies, and procedures.

NORTHGATE is responsible for the safety of its employees and subcontractors under its control, but assumes no responsibility for the activities of other contractors or their subcontractors who may be working concurrently at the general project location. NORTHGATE will use a reasonable degree of care when marking potentially hazardous areas within its project work site and restricting access as appropriate. NORTHGATE will not be responsible for others outside its control who disregard such marked hazards or restricted access. This HSP has been prepared specifically for this

project and is intended to address health and safety issues solely with respect to NORTHGATE's work. All references, therefore, to the site, the work, activities, site personnel, workers, persons, or subcontractors in this HSP are with respect to NORTHGATE work only.

2.0 SITE DESCRIPTION AND BACKGROUND

- The Site is owned by Cogentrix Energy, Inc. The Site consists of SEGS 1 and 2 which are concentrated solar power generating facilities collocated on a 333 acre parcel. The facility produces electricity from trough-shaped reflectors (mirrors), which focus the sun's energy on a glass encapsulated tube containing heat transfer fluid (htf). The heated htf, which is a high temperature oil, moves through the tubes to a central facility location (power block) where it is used to generate steam, which in turn is used to power a turbine generator. The htf used at SEGS 1 is Caloria HT-43, which is a de-waxed paraffinic petroleum distillate. At SEGS 2 the htf of choice is Therminol VP-1 (Dowtherm A), which is a eutectic mixture of biphenyl and diphenyl oxide. Therminol VP-1 can contain small concentrations of benzene.

3.0 PLANNED SITE ACTIVITIES

Scheduled work will consist of the following activities:

- Soil sampling; and
- Groundwater sampling.

Work is anticipated to begin on December 1, 2008 and is expected to last approximately five days.

4.0 KEY PROJECT PERSONNEL AND RESPONSIBILITIES

Project Manager	**Derrick Willis**
Site Safety Officer (SSO)	Dana Brown

The responsibilities of key project personnel are outlined below.

4.1 Project Manager

The Project Manager has the ultimate responsibility for the health and safety of NORTHGATE personnel at the Site. The Project Manager is responsible for:

- Ensuring that project personnel review and understand the requirements of this HSP;
- Keeping the Director of Health and Safety informed of project developments;
- Keeping on-site personnel, including subcontractors, informed of the expected hazards and appropriate protective measures at the Site; and
- Providing resources necessary for maintaining a safe and healthy work environment for NORTHGATE personnel.

4.2 Site Safety Officer

The SSO is responsible for enforcing the requirements of this HSP once Site work begins. The SSO has the authority to immediately correct situations where noncompliance with this HSP is noted and to immediately stop work in cases where an immediate danger to Site workers or the environment is perceived. Responsibilities of the SSO also include:

- Obtaining and distributing personal protective equipment (PPE) and air monitoring equipment necessary for this project;
- Limiting access at the Site to authorized personnel;
- Communicating unusual or unforeseen conditions at the Site to the Project Manager;
- Supervising and monitoring the safety performance of site personnel to evaluate the effectiveness of health and safety procedures and correct deficiencies;
- Conducting daily tailgate safety meetings before each day's activities begin; and
- Conducting a site safety inspection prior to the commencement of each day's field activities.

4.4 Subcontractor Personnel

Subcontractor personnel are expected to comply with the minimum requirements specified in this HSP. Failure to do so may result in the removal of the subcontractor or any of the subcontractor's workers from the job site. Subcontractors may employ health and safety procedures that afford them a greater measure of personal protection than those specified in this plan so long as they do not pose additional hazards to themselves, the environment, or others working in the area.

5.0 HAZARDS OF KNOWN OR EXPECTED CHEMICALS OF CONCERN

Anticipated Compounds	Source (soil/water/drum, etc.)	Known Concentration Range (ppm, mg/kg, mg/l)	
		Lowest	Highest
Total petroleum hydrocarbons (TPH)	Soil/groundwater	unknown	unkown
Pesticides	Soil	unknown	unknown
Herbicides	Soil	unknown	unknown

Exposure pathways of concern for chemical compounds that may be present at the Site are inhalation of airborne contaminants, direct skin contact with contaminated materials, and incidental ingestion of affected media. Wearing protective equipment and following decontamination procedures listed in Section 9 can minimize dermal contact and incidental ingestion. To minimize inhalation hazards, dust or vapor control measures will be implemented, where necessary, and action levels will be observed during scheduled activities. Site-specific action levels are presented in Section 10. Chemical descriptions of chemicals of concern, including health effects and exposure limits, are located in Appendix A.

In accordance with the Hazard Communication standard, material safety data sheets (MSDSs) will be maintained on site for chemical products used by NORTHGATE personnel at the Site. In addition, containers will be clearly labeled in English to indicate their contents and appropriate hazard warnings.

5.1 Air Monitoring

Real-time air monitoring devices will be used to analyze airborne contaminant concentrations every 30 minutes in the workers' breathing zones while workers are in the designated Exclusion Zone. If elevated concentrations are indicated, the monitoring frequency will be increased, as appropriate. The equipment will be calibrated daily, and the results will be recorded on NORTHGATE's Air Monitoring form or project log book. The results of air monitoring will be recorded on an NORTHGATE Air Monitoring Form or project log book and will be retained in the project files following completion of field activities. A copy of the Air Monitoring Form is located in Appendix B.

On-site worker exposure to airborne contaminants will be monitored during intrusive site activities. A calibrated photoionization detector (PID) with a lamp strength of 10.6 eV or flame ionization detector (FID) will be used to monitor changes in exposure to volatile organic compounds (VOCs). A miniature real-time aerosol monitor (mini-RAM, or equivalent) will be used to monitor exposure to total dusts. Personnel will

perform routine monitoring during site operations to evaluate concentrations of VOCs and/or total dusts in employee breathing zones. If VOCs and/or total dusts are detected above predetermined action levels specified in Section 10, the procedures found in Section 7 of this HSP will be followed.

6.0 PHYSICAL HAZARDS

The following potential physical hazards may be encountered during scheduled activities at the Site:

- Slips, trips, and falls;
- Heavy equipment;
- Heat stress;
- Cold stress;
- Noise;
- Electrical sources;
- Excavations;
- Underground and overhead utilities;
- Materials and equipment handling;
- Fire/explosion;
- Lightning/electrical storms; and
- Traffic

6.1 General Safe Work Practices

- Workers will thoroughly clean their hands, faces, and other potentially contaminated areas before smoking, eating, or leaving the Site.
- Respiratory devices may not be worn with beards or long sideburns, or under other conditions that prevent a proper seal.
- Accidents and/or injuries associated with work at the Site will be immediately reported to the SSO. If necessary, an incident report will be initiated by the SSO.
- Periodic safety briefings will be held to discuss current site conditions, field tasks being performed, planned modifications, and work concerns.
- Site conditions may include uneven, unstable, or slippery work surfaces. Substantial care and personal observation is required on the part of each employee to prevent injuries from slips, trips, and falls.

- Workers will maintain good housekeeping practices during field activities to maintain a safe working environment. The work site will be kept free of debris, waste, and trash.
- The "buddy system" will be used whenever appropriate.
- To prevent head injury, ANSI-approved hard hats will be worn at all times while the worker is in an area where overhead obstructions or falling objects may be encountered.
- To prevent eye injuries, workers must wear ANSI-approved safety glasses during field activities.

6.2 Heavy Equipment

Equipment, including earth-moving equipment, drill rigs, or other heavy machinery, will be operated in compliance with the manufacturer's instructions, specifications, and limitations, as well as any applicable regulations. The operator is responsible for inspecting the equipment daily to verify that it is functioning properly and safely.

Operation of equipment at the Site for the activities outlined in Section 3 poses potential physical hazards. The following precautions should be observed whenever heavy equipment is in use:

- PPE, including steel-toed boots, safety glasses, and hard hats, must be worn.
- Personnel must be aware of the location and operation of heavy equipment and take precautions to avoid getting in the way of its operation. Workers must never assume that the equipment operator sees them; eye contact and hand signals should be used to inform the operator of intent.
- Traffic safety vests are required for personnel working near mobile heavy equipment or near high traffic areas.
- Personnel should not walk directly in back of, or to the side of, heavy equipment without the operator's knowledge.
- Nonessential personnel will be kept out of the work area.

6.3 Heat Stress

Adverse climate conditions, primarily heat, are important considerations in planning and conducting site operations. Heat-related illnesses range from heat fatigue to heat stroke, with heat stroke being the most serious condition. The effects of ambient temperature can cause physical discomfort, loss of efficiency, and personal injury, and can increase the probability of accidents. In particular, protective clothing that decreases the body's ventilation can be an important factor leading to heat-related illnesses.

To reduce the possibility of heat-related illness, workers should drink plenty of fluids and establish a work schedule that will provide sufficient rest periods for cooling down. Personnel shall maintain an adequate supply of non-caffeinated drinking fluids on site for personal hydration. Workers should be aware of signs and symptoms of heat-related illnesses, as well as first aid for these conditions. These are summarized in the table below.

Condition	Signs	Symptoms	Response
Heat Rash or Prickly Heat	Red rash on skin.	Intense itching and inflammation.	Increase fluid intake and observe affected worker.
Heat Cramps	Heavy sweating, lack of muscle coordination.	Muscle spasms, and pain in hands, feet, or abdomen.	Increase fluid uptake and rest periods. Closely observe affected worker for more serious symptoms.
Heat Exhaustion	Heavy sweating; pale, cool, moist skin; lack of coordination; fainting.	Weakness, headache, dizziness, nausea.	Remove worker to a cool, shady area. Administer fluids and allow worker to rest until fully recovered. Increase rest periods and closely observe worker for additional signs of heat exhaustion. If symptoms of heat exhaustion recur, treat as above and release worker from the day's activities after he/she has fully recovered.
Heat Stroke	Red, hot, dry skin; disorientation; unconsciousness	Lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse.	Immediately contact emergency medical services by dialing 911. Remove the victim to a cool, shady location and observe for signs of shock. Attempt to comfort and cool the victim by administering small amounts of cool water (if conscious), loosening clothing, and placing cool compresses at locations where major arteries occur close to the body's surface (neck, underarms, and groin areas). Carefully follow instructions given by emergency medical services until help arrives.

6.4 Cold Stress

Workers performing activities during winter and spring months may encounter extremely cold temperatures, as well as conditions of snow and ice, making activities in the field difficult. Adequate cold weather gear, especially head and foot wear, is required under these conditions. Workers should be aware of signs and symptoms of hypothermia and frostbite, as well as first aid for these conditions. These are summarized in the table below.

Condition	Signs	Symptoms	Response
Hypothermia	Confusion, slurred speech, slow movement.	Sleepiness, confusion, warm feeling.	Remove subject to warm area, such as truck cab; give warm fluids; warm body core as rapidly as possible; remove outer clothing and wrap torso in blankets with hot water bottle or other heat source. Get medical attention immediately.
Frostbite	Reddish area on skin, frozen skin.	Numbness or lack of feeling on exposed skin.	Place affected extremity in warm, not hot, water, or wrap in warm towels. Get medical attention.

6.5 Noise

Noise may result primarily from the operation of drill rigs and mechanical equipment. The use of heavy equipment may generate noise above the Cal/OSHA permissible exposure limit for noise of 90 dBA for an 8-hour time-weighted average. Workers will wear appropriate hearing protection when operating or working near heavy equipment. If loud noise is present or normal conversation becomes difficult, hearing protection in the form of ear plugs, or equivalent, will be required.

6.6 Electric Shock

Electrical equipment to be used during field activities will be suitably grounded and insulated. Ground fault circuit interrupters (GFCI), or equivalent, will be used with electrical equipment to reduce the potential for electrical shock.

Lockout/tagout procedures in accordance with 8 CCR 3314 will be conducted before activities begin on or near energized or mechanical equipment that may pose a hazard to site personnel. Workers conducting the operation will positively isolate the piece of equipment, lock/tag the energy source, and verify effectiveness of the isolation. Only

employees who perform the lockout/tagout procedure may remove their own tags/locks. Employees will be thoroughly trained before initiating this procedure.

6.7 Excavations

A Cal/OSHA Excavation Permit (per 8 CCR 341) will be obtained by the Project Manager prior to the construction of any excavation greater than 5 feet in depth into which an NORTHGATE employee is required to descend. **Each** subcontractor whose employees will enter such an excavation is responsible for obtaining a permit from Cal/OSHA for its operations.

A competent person who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, will be present during excavation activities.

The atmosphere will be tested in excavations greater than 4 feet in depth where oxygen deficiency or toxic or flammable gases are likely to be present before employees are permitted to enter and begin work. The atmosphere should be ventilated and re-tested until flammable gas concentrations less than 10 percent of the lower explosive limit (LEL) are obtained. Worker entry will not be allowed if the oxygen concentration is less than 19.5 percent.

Workers will not enter excavations greater than 5 feet in depth without appropriate protective systems such as benching, sloping, or shoring. Side slopes will not be steeper than 1½:1 without a written report from a qualified civil or geotechnical engineer. Excavations will be constructed in accordance with the Cal/OSHA Excavation Safety Standard, 8 CCR 1541.

The competent person will inspect excavations daily. If there is evidence that a cave-in or slide is possible, work will cease until the necessary safeguards have been taken. Excavated material will be placed far enough from the edge of the excavation (a minimum of 2 feet) so that it does not fall back into the opening. At the end of each day's activities, open excavations will be clearly marked and secured to prevent nearby workers or unauthorized personnel from entering them. Remote sampling techniques will be the preferred method of sample collection in excavations.

6.8 Underground and Overhead Utilities

Reasonable efforts will be made to identify the location(s) of underground utilities (e.g., pipes, electrical conductors, fuel lines, and water and sewer lines) before mechanized soil intrusive work is performed. The state underground utility notification authority (e.g., USA, Dig Alert, Blue Stake) will be contacted prior to the start of intrusive field activities in accordance with local notification requirements. In areas not evaluated by the underground utility notification authority, and a reasonable potential

for underground utilities exists, one or more of the following techniques will be employed to determine the location of subsurface structures:

- Contracting the services of a qualified private utility locator;
- Having a survey of the subject area conducted by staff trained in the use of subsurface utility locating equipment; and
- Subsurface testing (i.e., potholing) to the expected depth of probable utilities (not less than 5 feet).

If utilities cannot be located or if unlocated utilities are suspected to be present, subsurface activities (i.e., borings, excavation) should not be conducted before the location(s) or absence of underground utilities is confirmed.

Equipment with articulated upright booms or masts shall not be permitted to pass within 20 feet of an overhead utility line (less than 50 kV) while the boom is in the upright position. For transmission lines in excess of 50 kV, an additional distance of 4 inches for each 10 kV over 50 kV will be used.

6.9 Materials and Equipment Handling Procedures

The movement and handling of equipment and materials on the Site pose a risk to workers in the form of muscle strains and minor injuries. These injuries can be avoided by using safe handling practices, proper lifting techniques, and proper personal safety equipment such as steel-toed boots and sturdy work gloves. Where practical, mechanical devices will be utilized to assist in the movement of equipment and materials. Workers will not attempt to move heavy objects by themselves without using appropriate mechanical aids such as drum dollies or hydraulic lift gates.

6.10 Fire/Explosion

Site workers should have an increased awareness concerning fire and explosion hazards whenever working with or near flammable materials, especially when performing any activity that may generate sparks, flame, or other source of ignition. Intrinsically safe equipment is required when working in or near environments with the potential for an explosive atmosphere. The SSO will verify facility requirements for a "hot work" permit before activities that may serve as a source of ignition are conducted.

Flammable materials will be kept away from sources of ignition. In the event of fire, work will cease, the area will be evacuated, and the local fire response team will be notified immediately. Only trained, experienced fire fighters should attempt to extinguish substantial fires at the Site. Site personnel should not attempt to fight fires, unless properly trained and equipped to do so. A fully charged ABC dry chemical fire extinguisher will be readily available for use during all scheduled activities at the Site.

6.11 Lightning/Electrical Storms

Lightning can be unpredictable and may strike many miles in front of, or behind, a thunderstorm. Workers will therefore cease field operations at the **first** sign of a thunderstorm and suspend activities until at least 30 minutes after the last observed occurrence of lightning or thunder. For purposes of this HSP, signs of a thunderstorm will include any visible lightning or audible thunder.

In the event of a thunderstorm, workers will take the following actions:

- Get inside a permanent building structure (not a shed or canopy) or fully enclosed metal vehicle (not a convertible or camper shell) with the windows fully up.
- Stay away from tall isolated objects, such as trees, drill rigs, telephone poles, or flag poles.
- Avoid large open areas, such as fields or parking lots, where a person is the relatively highest object.
- Stay away from lakes, ponds, railroad tracks, fences, and other objects that could transmit current from a distant lightning strike.

6.12 Traffic

Vehicular traffic presents opportunities for serious injury to persons or property. Traffic may consist of street traffic or motor vehicles operated by facility employees or visitors to the Site. Workers and other pedestrians are clearly at risk during periods of heavy traffic. Risk from motor vehicle operations may be minimized by good operating practices and alertness, and care on the part of workers and pedestrians.

Site personnel will wear high-visibility safety vests whenever activities are conducted in areas of heavy traffic. Work vehicles will be arranged to be used as a barrier between site workers and nearby traffic. If required by local ordinances or site location, a traffic control plan will be developed implemented.

7.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to protect employees from hazards and potential hazards they are likely to encounter during site activities. The amount and type of PPE used will be based on the nature of the hazard encountered of anticipated. Respiratory protection will be utilized when an airborne hazard has been identified using real-time air monitoring devices, or as a precautionary measure in areas designated by the Director of Health and Safety or SSO.

Dermal protection, primarily in the form of chemical-resistant gloves and coveralls, will be worn whenever contact with chemically affected materials (e.g., soil,

groundwater, sludge) is anticipated, without regard to the level of respiratory protection required.

NORTHGATE personnel will be provided with appropriate personal safety equipment and protective clothing. The SSO is to inform each worker about necessary protection and must provide proper training in the use of the safety equipment. The required PPE to be worn is described below.

7.1 Conditions Requiring Level D Protection

In general, site activities will commence in Level D PPE unless otherwise specified, or if the SSO determines on site that a higher level of PPE is required. Air monitoring of employee breathing zones will be routinely conducted using real-time air monitoring devices to determine if upgrading to Level C PPE is necessary. Level D PPE will be permitted as long as air monitoring data indicate that airborne concentrations of chemicals of concern are maintained below the site-specific action levels defined in Section 10.

It is important to note that dermal protection is required whenever contact with chemically affected soils or groundwater is anticipated. The following equipment is specified as the minimum PPE required to conduct activities at the Site:

- Work shirt and long pants;
- ANSI-approved steel-toed boots or safety shoes;
- ANSI-approved safety glasses; and
- ANSI-approved hard hat.

Other personal protection readily available for use, if necessary, includes the following:

- Outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated (nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event);
- Chemical-resistant clothing (e.g., Tyvek or polycoated Tyvek coveralls) when contact with chemically affected soils or groundwater is anticipated;
- Safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated;
- Hearing protection; and
- Sturdy work gloves.

7.2 Conditions Requiring Level C Protection

If air monitoring indicates that the site-specific action levels defined in Section 10 are exceeded, workers in the affected area(s) will upgrade PPE to Level C. In addition to the protective equipment specified for Level D, Level C also includes the following:

- NIOSH-approved half- or full-face air-purifying respirator (APR) equipped with filter cartridges as specified in Section 10.0. Note: safety glasses are not required when wearing a full-face APR.
- chemical-resistant clothing (e.g., Tyvek, polycoated Tyvek, or Saranex coveralls) when contact with chemically affected soils or groundwater is anticipated
- outer nitrile gloves and inner nitrile surgical gloves when direct contact with chemically affected soils or groundwater is anticipated (nitrile surgical gloves may be used for collecting or classifying samples as long as they are removed and disposed of immediately after each sampling event)
- safety shoes/boots with protective overboots or knee-high PVC polyblend boots when direct contact with chemically affected soils is anticipated

Respirators will be stored in clean containers (i.e., self-sealing bag) when not in use. Respirator cartridges will be replaced in accordance with the following change-out schedule.

Type of Cartridge	Cartridge Change-out Schedule
Particulate (i.e., HEPA)	At least weekly or whenever the employee detects an increase in breathing resistance. This will occur as the filter becomes loaded with particulate matter.
Sorbent (i.e., organic vapor)	At the end of each day's use or whenever the employee detects an abnormal odor or other indicator.

Personnel who wear air-purifying respirators will be trained in their use and must have successfully passed a qualitative respiratory fit test in accordance with 8 CCR 5144 within the last 12 months.

7.3 Conditions Requiring Stoppage of Work

If air monitoring indicates that the site-specific action levels defined in Section 10 are exceeded, activities must cease, and personnel must evacuate the Exclusion Zone (see Section 9). The Project Manager and Director of Health and Safety will be contacted immediately.

8.0 SAFETY PROCEDURES AND SITE REQUIREMENTS

A daily morning briefing to cover safety procedures and contingency plans in the event of an emergency is to be included with a discussion of the day's activities. These daily meetings will be recorded on NORTHGATE Daily Tailgate Safety Meeting Forms. A debriefing to cover the activities is to be held upon completion of the work. A copy of the Daily Tailgate Safety Meeting Form is included in Appendix B.

The SSO will conduct a safety inspection of the work site before each day's activities begin to verify compliance with the requirements of the HSP. Results of the first day's inspection will be documented on an NORTHGATE Site Safety Checklist. A copy of the checklist is included in Appendix B.

Minimum emergency equipment maintained on site will include a fully charged 20-pound ABC dry chemical fire extinguisher, an adequately stocked first aid kit, and an emergency eyewash station (when corrosive chemicals are present).

8.1 Training Requirements

Site personnel, including subcontractors and visitors conducting work in controlled areas of the Site, must have completed the appropriate training as required by 8 CCR 5192. Further site-specific training will be conducted by the SSO prior to the initiation of project activities. This training will include, but will not necessarily be limited to, emergency procedures, site control, personnel responsibilities, and the provisions of this HSP.

General site workers (such as equipment operators, general laborers, and supervisory personnel) engaged in hazardous substance removal or other activities that could expose them to hazardous substances must have successfully completed an initial 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training course. In addition, each employee must have attended an eight-hour annual HAZWOPER refresher training course within the past 12 months if their initial 40-hour HAZWOPER training course was completed more than 12 months prior.

8.2 Medical Surveillance Requirements

Site personnel, including subcontractors and site visitors, who will or may work in an area designated as an exclusion zone must have fulfilled the appropriate medical monitoring requirements in accordance with 8 CCR 5192(f). Each individual entering an exclusion zone must have completed an annual surveillance examination and/or an initial baseline examination within the last 12 months.

9.0 SITE CONTROL MEASURES

Procedures must be followed to maintain site control so that persons who may be unaware of site conditions are not exposed to hazards. The work area will be barricaded by tape, warning signs, or other appropriate means. Pertinent equipment or machinery will be secured and stored safely.

Access inside the specified work area will be limited to authorized personnel. Only NORTHGATE employees and designated NORTHGATE subcontracted personnel, as well as designated employees of the client, will be admitted to the work site. Personnel entering the work area are required to sign the signature page of this HSP, indicating they have read and accepted the health and safety practices outlined in this plan.

9.1 Establishing Work Zones

In some instances it may be necessary to define established work zones: an Exclusion Zone, a Contamination Reduction Zone, and a Support Zone. Work zones may be established based on the extent of anticipated contamination, projected work activities, and the presence or absence of non-project personnel. The physical dimensions and applicability of work zones will be determined for each area based on the nature of job activity and hazards present. Within these zones, prescribed operations will occur using appropriate PPE. Movement between zones will be controlled at checkpoints.

Considerable judgment is needed to maintain a safe working area for each zone, balanced against practical work considerations. Physical and topographical barriers may constrain ideal locations. Field measurements combined with climatic conditions may, in part, determine the control zone distances. Even when work is performed in an area that does not require the use of chemical-resistant clothing, work zone procedures may still be necessary to limit the movement of personnel and retain adequate site control.

Personnel entering the designated Exclusion Zone should exit at the same location. There must be an alternate exit established for emergency situations. In all instances, worker safety will take precedence over decontamination procedures. If decontamination of personnel is necessary, exiting the Site will include the decontamination procedures described below.

9.2 Decontamination Procedures

Despite protective procedures, personnel may come in contact with potentially hazardous compounds while performing work tasks. If so, decontamination needs to take place using an Alconox or TSP wash, followed by a rinse with clean water. Standard decontamination procedures for levels C and D are as follows:

- Equipment drop;

- Boot cover and outer glove wash and rinse;
- Boot cover and outer glove removal;
- Suit wash and rinse;
- Suit removal;
- Safety boot wash and rinse;
- Inner glove wash and rinse;
- Respirator removal;
- Inner glove removal; and
- Field wash of hands and face.

Workers should employ only applicable steps in accordance with level of PPE worn and extent of contamination present. The SSO shall maintain adequate quantities of clean water to be used for personal decontamination (i.e., field wash of hands and face) whenever a suitable washing facility is not located in the immediate vicinity of the work area. Disposable items will be disposed of in an appropriate container. Wash and rinse water generated from decontamination activities will be handled and disposed of properly. Non-disposable items may need to be sanitized before reuse. Each site worker is responsible for the maintenance, decontamination, and sanitizing of his/her own PPE.

Used equipment may be decontaminated as follows:

- An Alconox or TSP and water solution will be used to wash the equipment; and
- The equipment will then be rinsed with clean water.

Each person must follow these procedures to reduce the potential for transferring chemically affected materials off site.

10.0 ACTION LEVELS

The following action levels were developed for exposure monitoring with real-time air monitoring instruments as specified in Section 5.1. Air monitoring data will determine the required respiratory protection levels at the Site during scheduled intrusive activities. The action levels are based on sustained readings indicated by the instrument(s). Air monitoring will be performed and recorded at up to 30-minute intervals.

If elevated concentrations are indicated, the monitoring frequency will be increased, as appropriate. If during this time, sustained measurements are observed, the following actions will be instituted, and the Project Manager and Director of Health and Safety will be notified. For purposes of this HSP, sustained readings are defined as the average airborne concentration maintained for a period of one (1) minute.

Activity	Action Level	Level of Respiratory Protection
Drilling exploratory borings/excavation of impacted soil	< 5 ppm above background (VOCs) < 0.5 mg/m^3 above background (dust)	Level D: No respiratory protection required.
	5 to 25 ppm (VOCs) 0.5 to 1.5 mg/m^3 (dust)	Level C: Half-or full-face air-purifying respirator fitted with organic vapor/HEPA filter cartridges.
	> 25 ppm (VOCs) > 1.5 mg/m^3 (dust)	Cease operations and evacuate work area. Contact Director of Health and Safety and Project Manager immediately.

11.0 CONTINGENCY PROCEDURES

In the event of an emergency, site personnel will signal distress with three blasts of a horn (a vehicle horn will be sufficient), or other predetermined signal. Communication signals, such as hand signals, must be established where communication equipment is not feasible or in areas of loud noise.

It is the SSO's duty to evaluate the seriousness of the situation and to notify appropriate authorities. Section 12 of this plan contains emergency telephone numbers as well as directions to the hospital. Nearby telephone access must be identified and available to communicate with local authorities. If a nearby telephone is not available, a cellular telephone will be maintained on site during work activities.

Personnel should contact local emergency services in the event of an emergency (see Section 12). After emergency services are notified, the Project Manager and Director of Health and Safety will be notified of the situation as soon as possible. If personal injury, property damage, or equipment damage occurs, the Project Manager and NORTHGATE Corporate Administration will be contacted as soon as practicable. An Incident Report form will be completed within 24 hours by the SSO or another designated person. A copy of the NORTHGATE Incident Report form is included in Appendix B.

11.1 Injury/Illness

If an exposure or injury occurs, work will be temporarily halted until an assessment can be made of whether it is safe to continue work. The SSO, in consultation with the Director of Health and Safety, will make the decision regarding the safety of continuing work. The SSO will conduct an investigation to determine the cause of the incident and steps to be taken to prevent recurrence.

In the event of an injury, the extent and nature of the victim's injuries will be assessed and first aid will be rendered as appropriate. If necessary, the individual may be transported to the nearby medical center. The mode of transportation and the eventual destination will be based on the nature and extent of the injury. A hospital route map is presented in Appendix C.

In the event of a life-threatening emergency, the injured person will be given immediate first aid and emergency medical services will be contacted by dialing the number listed in Section 12. The individual rendering first aid will follow directions given by emergency medical personnel via telephone. When working in areas where medical services are not readily available, a person trained in first aid/CPR techniques will be present during field activities.

11.2 Fire

In the event of fire, personnel should contact the local fire department immediately by dialing 911. When representatives of the fire department arrive, the SSO, or designated representative, will advise the commanding officer of the location, nature, and identification of hazardous materials on site. Only trained, experienced fire fighters should attempt to extinguish substantial fires at the Site. Site personnel should not attempt to fight fires, unless properly trained and equipped to do so.

Smoking is not permitted in controlled areas (i.e., exclusion or contamination reduction zones), near flammable or combustible materials, or in areas designated by the facility as non-smoking areas.

11.3 Underground Utilities

In the event that an underground conduit is damaged during excavation or drilling, mechanized equipment will immediately be shut off until the nature of the piping can be determined. Depending on the nature of the broken conduit (e.g., natural gas, water, or electricity), the appropriate local utility will be contacted.

11.4 Evacuation

The SSO will designate evacuation routes and refuge areas to be used in the event of an emergency. Site personnel will stay upwind from vapors or smoke and upgradient from spills. If workers are in an Exclusion or Contamination Reduction Zone at the start of an emergency, they should exit through the established decontamination areas whenever possible. If evacuation cannot be done through an established decontamination area, site personnel will go to the nearest safe location and remove contaminated clothing there or, if possible, leave it near the Exclusion Zone. Personnel will assemble at the predetermined refuge following evacuation and decontamination. The SSO, or designated representative, will count and identify site personnel to verify that all have been evacuated safely.

11.5 Hazardous Material Spill

If a hazardous material spill occurs, site personnel should locate the source of the spill and determine the hazard to the health and safety of site workers and the public. Attempt to stop or reduce the flow if it can be done without risk to personnel. Isolate the spill area and do not allow entry by unauthorized personnel. De-energize sources of ignition within 100 feet of the spill, including vehicle engines. Should a spill be of the nature or extent that it cannot be safely contained, or poses an imminent threat to human health or the environment, an emergency cleanup contractor will be called out as soon as possible. Spill containment measures listed below are examples of responses to spills.

- Right or rotate containers to stop the flow of liquids. This step may be accomplished as soon as the spill or leak occurs, providing it is safe to do so.
- Sorbent pads, booms, or adjacent soil may be used to dike or berm materials, subject to flow, and to solidify liquids.
- Sorbent pads, soil, or booms, if used, shall be placed in appropriate containers after use, pending disposal.
- Contaminated tools and equipment shall be collected for subsequent cleaning or disposal.

12.0 EMERGENCY CONTACTS

Emergency Services (Police/Fire Department/Ambulance):	911
National Response Center:	(800) 424-8802
Poison Control Center:	(800) 876-4766 or (800) 222-1222
CHEMTREC:	(800) 424-9300
NORTHGATE Project Manager: (Derrick Willis)	(949) 260-9293
Cell Phone:	(949) 375-7004
NORTHGATE Oakland office:	(510) 839-0688

Nearby Hospital:

Barstow Community Hospital

555 South 7th Avenue
Barstow, CA 92311
(760) 256-17611

Directions to Hospital:

From the guard shack at the main gate, head southeast on Sunray Street toward Santa Fe Street. Turn RIGHT at Santa Fe Street and stay on it until A Street in Daggett. Turn RIGHT on A Street and take the ramp onto CA-40 West. Take Exit Barstow Road in Barstow and turn RIGHT or North. Turn RIGHT at East Mountain View Street and go one block east. Turn left at 7th Street, hospital will be on the right. Total drive time approximately 12 minutes.

A hospital route map is presented in Appendix C.

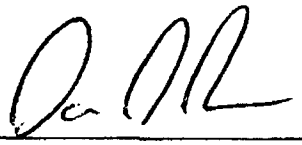
13.0 NORTHGATE APPROVALS

This HSP has been prepared for the following project:

Solar Energy Generating System (SEGS) 1 & 2 Site
Daggett, California

NORTHGATE Project Number: 2024.01S

This HSP has been reviewed and approved by the following NORTHGATE personnel:



11/29/08

Dana Brown — Date
Site Safety Officer

Derrick Willis — Date
Project Manager

SIGNATURE PAGE

The following signatures indicate that this Health and Safety Plan has been read and accepted by NORTHGATE personnel as well as subcontractors and their personnel.

NAME	COMPANY	SIGNATURE	DATE
GILBERT MENDOZA	INTERPHASE		12/3/08
Luis Tellez	Interphase		12/3/08
	TEC		12/3/08
David L	NGEM	David L	12/3/08

Important notice to subcontractor(s):

This Health and Safety Plan has been prepared solely for the use of NORTHGATE personnel. It is supplied to you for informational purposes only and may not be relied upon for protection of your employees. The Subcontractor is responsible for providing, at its cost, all personal protective clothing and equipment required for its employees to perform their work in a safe manner and in compliance with all applicable state and federal OSHA regulations. Subcontractor is responsible for ensuring that such equipment is in good condition and is properly inspected and maintained. Subcontractor must, at a minimum, use the equipment and follow the procedures described in this HSP. Failure to do so may result in immediate termination of Subcontractor's services. This does not relieve Subcontractor of the responsibility to provide equipment and institute procedures affording a greater degree of protection than those specified in this HSP should Subcontractor determine such measures are necessary to protect the health and welfare of its employees, second-tier subcontractors, or others under its control or direction.

APPENDIX A

CHEMICAL DESCRIPTIONS

CHEMICAL DESCRIPTIONS

The following chemical descriptions are presented for chemicals that may be present at the Site. Each chemical description includes physical and odor recognition characteristics, health effects associated with exposure, and exposure limits expressed as an eight-hour time weighted average (TWA). Provided are federal OSHA ("OSHA") permissible exposure limits (PELs; located in 29 CFR 1910.1000); California OSHA ("Cal/OSHA") PELs (located in 8 CCR 5155); and/or American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).

PETROLEUM HYDROCARBONS

Petroleum distillates (naphtha) are mildly toxic by inhalation. They can cause unconsciousness, dyspnea, and a bluish tint to the skin. Recovery follows after removal from exposure. In mild form, intoxication resembles drunkenness. On a chronic basis, no true poisoning occurs; however, effects may include headache, lack of appetite, dizziness, sleeplessness, indigestion, and nausea. It is combustible when exposed to heat or flame and can react with oxidizing materials.

- The OSHA PEL is listed as 500 ppm (as petroleum distillates).
- The Cal/OSHA PEL is listed as 300 ppm (as VM&P naphtha), 100 ppm (as stoddard solvent), and 300 ppm (as gasoline).

The TLV is listed as 300 ppm (as VM&P naphtha), 100 ppm (as stoddard solvent), and 300 ppm as gasoline).

DICHLORODIPHENYLTRICHLOROETHANE (DDT), DICHLORODIPHENYLDICHLOROETHANE (DDD), AND DICHLORODIPHENYLDICHLOROETHYLENE (DDE)

DDT consists of colorless crystals or off-white powder with a slight, aromatic odor. Symptoms of exposure via inhalation, absorption, ingestion, or contact might consist of irritation to the eyes, skin; paresthesia of the tongue, lips, face; tremor; apprehension, dizziness, confusion, malaise, headache, fatigue; convulsions; paresis of hands; vomiting. DDT is a potential occupational carcinogen. Target organs are the eyes, skin, central nervous system, kidneys, liver, peripheral nervous system.

DDD and DDE are metabolites of DDT. DDD and DDE are closely related chemically and are similar in properties to DDT, but are considered less toxic to animals.

- The OSHA PEL for DDT is listed as 1 mg/m^3.

CHLORDANE

Chlordane is an amber-colored, viscous liquid with a pungent, chlorine-like odor. Symptoms of exposure via inhalation, absorption, ingestion, or contact might consist of blurred vision; confusion; ataxia, delirium; cough; abdominal pain, nausea, vomiting, diarrhea; irritability, tremor, convulsions; anuria; in animals, lung, liver, and kidney damage. Chlordane is a potential occupational carcinogen. Target organs are the central nervous system, eyes, lungs, liver, and kidneys.

- The OSHA PEL is listed as 0.5 mg/m^3.

ARSENIC

Arsenic is a metal whose appearance and odor vary depending on the specific organic arsenic compound. Symptoms of exposure via inhalation, ingestion, or contact might include skin irritation, possible dermatitis; respiratory distress; diarrhea; kidney damage; muscle tremor, seizure; possible GI tract, teratogenic, reproductive effects; possible liver damage.

- The OSHA PEL is listed as 0.5mg/m^3.

LEAD

Lead is a heavy, ductile, soft, gray solid. Symptoms of exposure via inhalation, ingestion, and contact might include weakness, lassitude, insomnia; facial pallor; pal eye, anorexia, low weight, malnutrition; constipation, abdominal pain, colic; anemia, gingival lead line; tremor; paralysis of wrist and ankles; encephalopathy; kidney disease; eye irritation; hypotension.

- The OSHA PEL is listed as 0.050 mg/m^3.

APPENDIX B

NORTHGATE FORMS

AIR MONITORING FORM

Date _____ *NORTHGATE Project No.* _____

Project Name _____ *Type of Activities* _____

Type of PID/FID _____ *Serial No.* _____

Initial Calibration Reading _____ *End-of-Use Calibration Check* _____

Calibration Standard/Concentration _____

Mini-RAM Serial No. _____ *Zeroed in Z-Bag?* ☐ Yes ☐ No

Time	Activity/Location	PID/FID (ppm)	Mini-RAM (mg/m³)

Name (print) _____ *Signature* _____

SITE SAFETY CHECKLIST

Project Name _____ *NORTHGATE Project No.* _____

Project Activities _____

	YES	NO	N/A
Written Health and Safety Plan (HSP) is on site	☐	☐	☐
Addenda to the HSP are documented on site	☐	☐	☐
Information in the HSP matches conditions and activities at the site	☐	☐	☐
HSP has been read and signed by all site personnel, including visitors	☐	☐	☐
Daily tailgate safety meetings have been held and documented	☐	☐	☐
Site personnel have appropriate training and medical clearance	☐	☐	☐
Air monitoring is performed and documented as described in the HSP	☐	☐	☐
Air monitoring equipment has been calibrated daily	☐	☐	☐
Site zones are set up and observed where appropriate	☐	☐	☐
Access to the work area limited to authorized personnel	☐	☐	☐
Decontamination procedures are followed and match the requirements of the HSP	☐	☐	☐
Decontamination stations (including hand/face wash) are set up and used	☐	☐	☐
Personal protective equipment used matches HSP requirements	☐	☐	☐
Hearing protection used where appropriate	☐	☐	☐
Respirators are properly cleaned and stored	☐	☐	☐
Utility locator has cleared subject locations	☐	☐	☐
Overhead utilities do not present a hazard to field equipment/personnel	☐	☐	☐
Traffic control measures have been implemented	☐	☐	☐
Trenches and excavations are in compliance with federal, state, and local safety requirements before worker entry	☐	☐	☐
Spoils are placed no closer than 2 feet from the edge of an excavation	☐	☐	☐
Emergency and first aid equipment is on site as described in the HSP	☐	☐	☐
Drinking water is readily available	☐	☐	☐
Accessible phone is readily available for emergency use	☐	☐	☐
Proper drum and material handling techniques are used	☐	☐	☐
Drums and waste containers are labeled appropriately	☐	☐	☐
Extension cords are grounded and protected from water and vehicle traffic	☐	☐	☐
Tools and equipment are in good working order	☐	☐	☐

Notes (All "no" answers must be addressed and corrected immediately. Note additional health and safety observations here): _____

_____

_____

_____

_____

_____

Conducted By: _____ *Signature:* _____ *Date:* _____

DAILY TAILGATE SAFETY MEETING FORM

Date _____ *Time* _____ *NORTHGATE Project No.* _____

Project Name _____ *Specific Location* _____

Type of Work _____

Chemicals Present _____

SAFETY TOPICS DISCUSSED

Protective Clothing/Equipment _____

_____

Hazards of Chemicals Present _____

_____

Physical Hazards _____

_____

Special Hazards _____

_____

Other Topics _____

_____

ATTENDEES

Name (please print) ***Signature***

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

INCIDENT REPORT FORM

INSTRUCTIONS: Complete, obtain Ops. Mgr.'s signature and route original to your Administrative Manager within 3 days of the Incident.

Office:	Department:	Supervisor:
Name:	Occupation:	
Exact Location Incident Occurred: (Street Address, City, State)	Project No.:	Project Name:
Date and Time of Occurrence:	Time Began Work on Day Injury Occurred:	
Date and to Whom Initially Reported:		
Nature of Incident: (e.g. strain, contusion, laceration, abrasion)		
Parts of Body Affected:		
Type of Activity Engaged in and Equipment Being Used When Incident Occurred: (e.g. water/soil/air sampling, site assessment, hand augering)		
Person with Most Control of Object/Equipment/Substance:		
Witness:		

Describe clearly how the incident occurred: _____

_____

_____

Were Safety Equipment/Safeguards Required for this Particular Job/Activity? ☐ Yes ☐ No **If yes, were they used?**

Indicate by an "x" if in your opinion the incident was caused by:

Physical Causes

- ☐ Defective Equipment
- ☐ Hazardous Equipment
- ☐ Improper Dress
- ☐ Improper Guarding
- ☐ Improper Ventilation
- ☐ Other _____

Unsafe Acts

- ☐ Operating Without Authority
- ☐ Failure to Wear Protective Equipment
- ☐ Horseplay
- ☐ Failure to Secure or Warn
- ☐ Took Unsafe Position
- ☐ Used Unsafe Equipment or Hands Instead of Equipment
- ☐ Worked on Moving/Energized Equipment
- ☐ Unsafe Equipment
- ☐ Unsafe Loading

Do you require medical attention at this time? ☐ No ☐ Yes **Treated in an emergency room?** ☐ No ☐ Yes

Hospital Name & Address: _____

Physician Name & Address: _____

What actions will be taken to prevent reoccurrence?

_____

Employee Signature:	Group Manager Signature:
Date:	Print Name:
Phone No.:	Date:

APPENDIX C

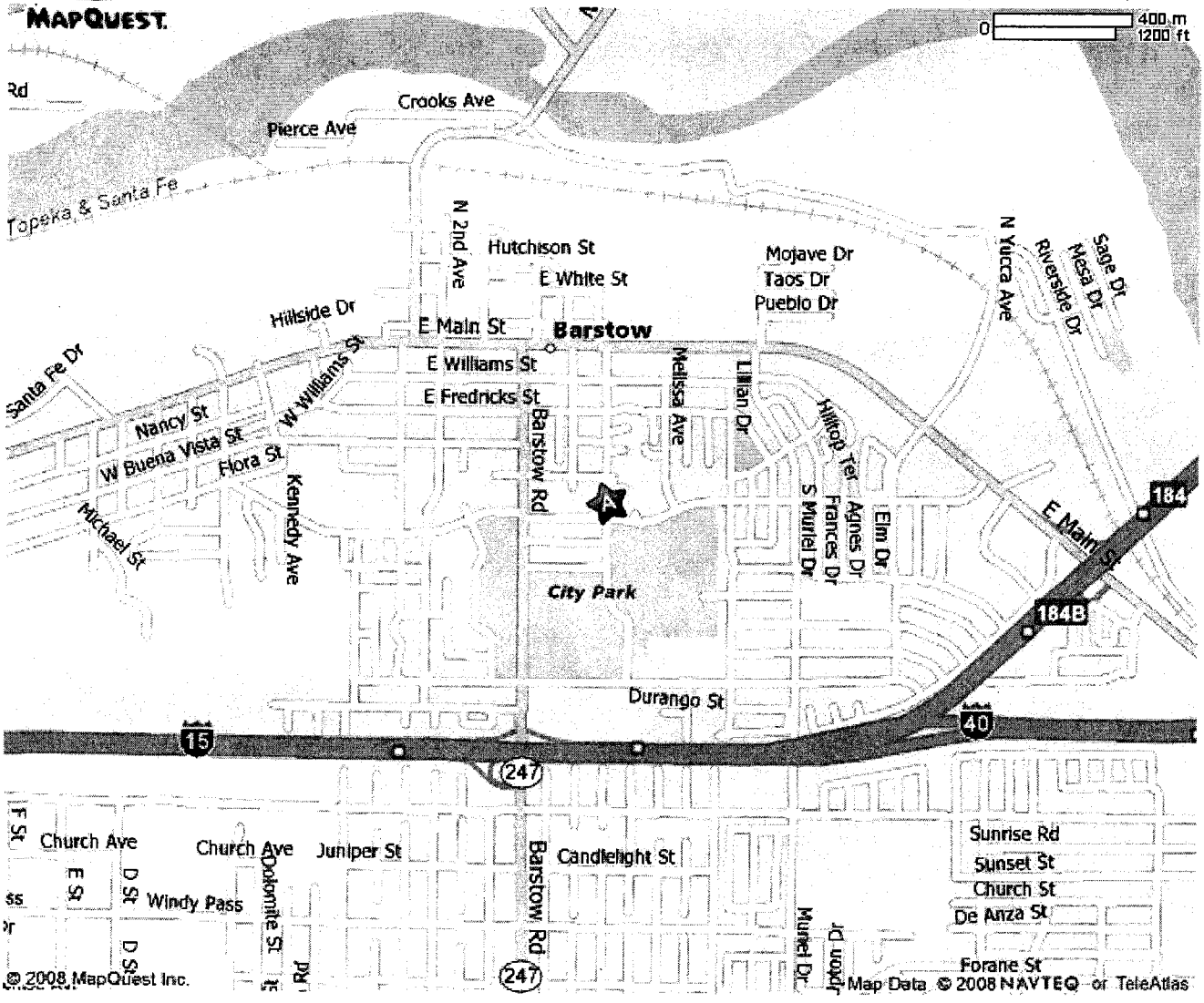
HOSPITAL ROUTE MAP

MAPQUEST

Barstow Community Hospital
555 South 7th Avenue
Barstow, CA 92311
(760) 256-1761

A: 555 S 7th Ave, Barstow, CA 92311-3043

Need help on the go? Get Voice Activated Directions for free. Call **1-800-FREE411** (1-800-373-3411).



APPENDIX B
FIELD PROCEDURES

Standard Operating Procedure No.1
Decontamination of Equipment Used To Sample Soil or Water

Field personnel shall set up the area used to decontaminate soil and water sampling equipment in the manner shown on Figure 1-1. This area shall be located approximately 15 feet away from the specific sampling area. The personnel performing the decontamination procedures shall wear disposable surgical gloves. A record of the decontamination procedures performed and equipment cleaned shall be kept on the Decontamination Record (Form 1-1).

Procedures Used to Decontaminate Soil Sampling Equipment
The following decontamination procedures shall be utilized for contaminated soil sampling equipment. Table 1.1 lists the equipment that shall be used to decontaminate the soil sampling equipment. The specific procedures for decontaminating soil sampling equipment include:

1. At Station No. 1 wash the contaminated equipment in a tub containing tap water mixed with a phosphate-free industrial strength soap such as Alconox (Bucket No. 1). During the wash cycle scrub the equipment thoroughly with a bristle brush.
2. Move the equipment to the rinse line at Station No. 2. Rinse the equipment with clean water (Bucket No. 1), and then with distilled/deionized (DS/DI) water (Bucket No. 2).
3. At Station No. 3, place the clean equipment on plastic sheeting until it is used again. Soil sampling equipment that will not be used immediately shall be wrapped in clean plastic.

Procedures Used to Decontaminate Water Sampling Equipment
The following decontamination procedures shall be utilized for water sampling equipment. Table 1.2 lists the equipment that shall be used to decontaminate water sampling equipment.

The specific procedures for decontaminating water sampling equipment include:

1. At Station No. 1, wash the contaminated equipment in a tub containing water mixed with a phosphate-free industrial strength soap such as Alconox (Bucket No. 1). Scrub the equipment thoroughly with a bristle brush during the wash cycle.
2. At Station No. 1, perform a second wash of the contaminated equipment in a tub containing water mixed with a phosphate-free industrial strength soap such as Alconox (Bucket No. 2).
3. Move the equipment to the rinse line at Station No. 2. First, rinse the equipment with clean water (Bucket No. 1), then rinse the equipment using DS/DI water (Bucket No. 2).

4. At Station No. 3, place the clean equipment on plastic sheeting until it is used again. Water sampling equipment that will not be used immediately shall be wrapped in clean plastic.

Disposal of Decontamination Materials

Based on the sample data results from previous investigations and anticipated quantity of material, disposal of investigation-derived waste shall consist of the following:

1. Following the decontamination of sampling equipment, the disposable gloves and used plastic from Station No. 3 shall be placed in garbage bags and disposed of in a trash collection facility.
2. The wash and rinse water from Station No. 1 and No. 2 shall be disposed of by placing the solutions in the SEGS2 HTF contaminated area.

TABLE 1.1

DECONTAMINATION EQUIPMENT FOR SOIL SAMPLING

Plastic tubs (3)
Tap water
DS/DI water
Phosphate-free detergent (e.g., Alconox)
Hard-bristle brushes
Plastic sheeting or garbage bags
Latex gloves

Equipment at Decontamination Stations

Station No. 1
Alconox, tap water, plastic washtub, scrub brush
Station No. 2
Plastic washtubs (2), tap water, DS/DI water.
Station No. 3
Plastic sheeting or garbage bags

TABLE 1.2

DECONTAMINATION EQUIPMENT FOR WATER SAMPLING

Plastic tubs (3)
Tap water
DS/DI water
Phosphate-free detergent (e.g., Alconox)
Hard-bristle brushes
Plastic sheeting or garbage bags
Latex gloves
PVC outer gloves

Equipment at Decontamination Stations

Station No. 1
Alconox, tap water, plastic washtubs (2), scrub brush.

Station No. 2
Plastic washtubs (2), tap water, DS/DI water.

Station No. 3
Plastic sheeting or garbage bags

Standard Operating Procedure No. 2
Sample Collection from Soil Borings and Hand Auger Points,
Method 5035 Sample Collection

Soil Boring Procedures

The following procedures are designed to be used during the operation of drill rigs or hand augers during soil sampling operations. Health and safety procedures during sampling activities are described in the Workplan. The procedures listed below may be modified in the field by the agreement of the onsite geologist and drill operators based on field and site conditions after appropriate annotations have been made on the Daily Field Report form.

Sampling intervals and sampling devices shall be specified in the Workplan. Field personnel shall be familiar with the content of the Workplan and shall keep a field copy of the Workplan onsite during sampling activities.

1. Locate the site as directed in the Workplan.
2. Drillers prepare rig for operation. This includes but is not limited to decontamination of the drill rig tools and sampling equipment; placing plastic sheeting under the rig and leveling the rig; preparing the downhole tools, auger "flights", core barrel, and drill bit; and establishing the drill over the location.
3. Boreholes shall be abandoned in accordance with state regulations.

Split Spoon Sample Collection

1. Line the pre-cleaned split spoon sampler in accordance with the Workplan.
2. Mount the split spoon sampler to the drive stem.
3. Set the split spoon sampler on the bottom of the borehole and advance the sampler to the desired depth using the rig hammer. Record the number of blows required to advance the sampler through each six-inch depth interval.
4. After driving the split spoon sampler its entire length or upon refusal of advancement, recover the split spoon sampler. Refusal is defined as 50 blows with the rig hammer with less than six inches of advancement of the split spoon sampler. This decision shall be made at the discretion of the field sampler.
5. After recovery of the split spoon sampler, open sampler and place in a holding device, maintaining the intervals as sampled. If laboratory analyses are specified in the Workplan, proceed with sample collection.
6. Sampling personnel will then describe the soil sample using the USCS and ASTM D-2488 (Visual-Manual Procedure) and fill out the appropriate field forms (i.e., Daily Field Report or Field Sampling Data Form), field boring logs, and quality assurance/quality control documentation. An example of the standard boring log form is presented in Figure 3-1.

7. Decontaminate the split spoon sampler according to procedures presented in SOP-6.
8. Repeat Steps 1 to 7 until sampling is completed.
9. The drill rig tools and sampling equipment shall be decontaminated prior to moving onto the next site. The drill rig will be left in a safe and secure fashion at the end of each shift.
10. Sample locations shall be marked with white paint or a survey stake.

Core Barrel Sample Collection

1. Line the core barrel sample in accordance with the workplan and install basket retainer (sand catcher), if necessary.
2. Mount the core barrel sampler to the drive stem.
3. Place the core barrel sampler on the ground surface and advance sampler to desired depth by rotating the drive stem.
4. Recover the sampler, remove liner from sampler and record lithology on boring log (Figure 3-1). If laboratory analyses are specified in the FSP, proceed with sample collection.
5. Advance augers to bottom of sample interval.
6. Decontaminate sampler according to SOP-1 and repeat Steps 1 to 6 until sampling is completed.
7. Decontaminate drill rig tools and sampling equipment prior to moving onto next site.

EPA Method 5035 Soil Sample Collection

The stationary laboratory that will perform the soil analysis will provide preserved, tared, and labeled VOA vials that have PTFE-lined septum caps. The preservation fluid is either methanol or sodium bisulfate solution. The selection of the preservation fluid is based upon the desired method detection limits (Low Level Analysis or High Level Analysis) and the data quality objectives. Soil subcores of appropriate mass are placed into the VOA vials in the field and are capped, forming an airtight seal. Usually three co-located samples are taken and placed into their individual vials so that the laboratory has an appropriate sample volume. A disposable coring device (e.g. the Lock N' Load soil sampling tool), which can readily transfer the soil subcore into the relatively narrow opening of the VOA vial is used to collect the soil.

The procedure for collecting soil samples using EPA Method 5035 is as follows:

1. Push the coring device into a freshly exposed soil surface.
2. Continue pushing until the appropriate amount of soil has been collected, normally this is after the soil column inside the coring device has forced the device's plunger to the stopping point.
3. Use a paper towel to quickly wipe the exterior of the coring device to remove excess soil.
4. Insert the end of the coring device into the pre-tared VOA vial and eject the soil sample into the vial by pushing on the plunger of the coring

device. Avoid splashing the preservative out of the VOA vial by holding the VOA vial at an angle.

5. Quickly cap and seal the VOA vial. Note: this should be done as quickly as possible to prevent VOC loss.
6. Gently swirl the soil sample in the VOA vial to mix and break up the soil aggregate until the soil is covered with the preservative.
7. Using the pre-attached label on the VOA vial, complete the label information as needed.
8. Place the VOA vial into a resealable plastic bag and place the package into a cooler chilled to 4 +/- 2C.
9. The VOA vials should be transported to the analytical in an upright position whenever possible.
10. Repeat the procedure as necessary to obtain the required number of Method 5035 soil samples.

Notes:

1. Do not use or submit samples for analysis if the preservative has spilled or splashed from the VOA vial.
2. Extra tared and preserved VOA vials should be taken into the field anticipating potential preservative loss due to evaporation or spillage.
3. Rough trimming of a sampling locations surface layer should be considered if the soil has been exposed to ambient air for more than two minutes. Removal of the surface layer can be accomplished by scraping the soil surface with a clean spatula, scoop, trowel, or knife.
4. The collection of subsequent co-located subcores should not begin until the previous subcore is sealed in its vial.
5. Field personnel should wear gloves during sample collection to avoid VOC exposure.

Standard Operating Procedure No. 3
Groundwater Sampling

FIELD MEASUREMENTS

Once a well has been located and properly identified, the following field measurements should be noted in the Daily Field Report or the Field Sampling Data Form, as appropriate. A cross reference should be made between the field measurements identifying the well and the measurements of the well to be sampled to ensure that the proper well has been selected.

Physical Measurements

1. Presence and diameter of protective casing, and type of access;
2. Type of well plug, lock type and serial number (if lock is present at the well);
3. Diameter and construction material of the well casing;
4. Depth from the TOC to water. Static water level measurements are taken to the nearest 0.01 foot from the marked point or, if not marked, the highest point on the well casing; and
5. Total depth of the well from the TOC, or surveyor's mark (if present).

Note: Groundwater is normally not sampled from wells containing product sheen or LNAPL.

Groundwater Sampling Calculations

1. Calculate the linear feet of water in the well by subtracting depth to water from total depth of the well.
2. Calculate the volume of water present in the well casing by multiplying the linear feet of water by the volume of water per linear foot for the diameter of the well, as given in the following table.

WELL CASING DIAMETER/CAPACITY	
Inside Casing Diameter (inches)	Gallons per Linear Foot
2	.16
4	.65
6	1.47
8	2.61

Example calculation:

Total depth of casing	100 ft.
Depth to water	-20 ft.
Linear water column	80 ft.
2" casing	x .16

Amount of water in casing 12.80 gallons

Alternatively, use this formula to determine the gallons in any size pipe:

$$\text{Volume} = \frac{3.1416 \times r^2 \times h \text{ (in inches)}}{231}$$

Physical-Chemical Parameters
In addition to the physical measurements taken above and other information that may identify the well, the following physical-chemical information should be recorded initially, during evacuation, and prior to sampling (see SOP-6 *Field Measurement of pH, Specific Conductance, Temperature, and Turbidity for Aqueous Samples*):

1. pH;
2. Specific conductance;
3. Temperature; and
4. Turbidity.

Well Purging and Evacuation Procedures
To obtain a representative sample of groundwater, the well should be purged or evacuated to allow fresh or formation groundwater to enter the well. The optimum or preferred method to ensure that fresh water representative of the aquifer in contact with the well screen is being sampled is to perform a controlled sampling experiment.

Wells will be presumed to be adequately flushed for a representative sample when indicator parameters such as pH, specific conductance, temperature, and turbidity are observed to vary by less than +/-10 percent. Measurement of the field indicators will be recorded at a minimum frequency of once per casing volume removed. Evacuation of three to six well volumes may be necessary to meet the indicator parameter criteria; however, in wells with very low recoveries this amount may not be practical. In these instances, the well may be evacuated to near dryness and allowed to recover prior to sampling. Evacuation rates should be kept well below 10 gallons per minute and in most cases should be below five gallons per minute.

Evacuation Methods
The evacuation of monitoring wells prior to sampling will be accomplished using a bailer, hand-lift pump, a submersible pump, or other appropriate methods that will not impact the integrity of the sample. Prior to beginning evacuation, non-disposable equipment should be decontaminated according to pertinent decontamination procedures (SOP-1 *Decontamination of Equipment Used to Sample Soil, LNAPL, and Water*).

The selection of an evacuation method most often relies on the expected recharge. If the recharge is anticipated to be rapid, a submersible pump may be used. Care should be utilized to ensure this does not act as a route of cross-contamination.

Hand bailing may be utilized in any case, but in general is more efficient in wells with a low recharge rate. A new length of either nylon or PVC cord should be used for each well and for each evacuation event.

Groundwater Sample Collection

Sampling can begin after evacuation of the required volume of water from the well, and a target recovery value for water level has been attained. Sampling should occur as soon as possible after evacuation and well recovery, preferably immediately. In most cases, the time lapse between evacuation and sampling should not exceed two hours. Field quality control samples shall be collected in accordance with the Workplan.

The collected groundwater samples will be placed in the appropriate types of containers specified in the Workplan. Following collection, the samples should be prepared for shipping and necessary documentation should be completed (Chain-of-custody forms).

The bailer and other equipment placed in the well should be clean (i.e., decontaminated) or new and handled with new surgical gloves to preclude potential contamination. Objects entering the well should not be allowed to contact the ground or other potentially contaminated surface. If an item is contaminated, it should not be placed in the well or utilized for sampling.

APPENDIX C
WELL LOGS

northgate
environmental management, inc.

Boring Log

Northgate Environmental Management
1100 Quail Street, Suite 102
Newport Beach, CA 92660
949.260.9293

Project Number: 2024.01		**Boring ID: EY-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	EY-1(0-1) 13:20	48/48	X		SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), very-loose, dry. 5% sub-rounded gravel to 1/2"-, 60% fine to medium sub-angular sand, 35% non-plastic fines. Slight HC odor and visible staining.	
						Oil staining observed 0' to 3.5'.	
5–8	EY-1(5-6) 13:22	48/48	X		SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose, dry. Trace fine sub-angular gravel to 1/2"-, 95% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
8–12		48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose, dry. 5% fine sub-angular gravel to 3/8"+, 90% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
12						T.D. = 12.0' @ 13:25; 12/03/08	
13–20							

northgate
environmental management, inc.

Boring Log

Northgate Environmental Management
1100 Quail Street, Suite 102
Newport Beach, CA 92660
949.260.9293

Project Number: 2024.01		**Boring ID: EY-2**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	EY-2(0-1) 13:42	48/48			SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), medium-stiff, dry. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
2							
3							
4					SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose to loose, dry. Trace fine sub-angular gravel to 3/8"+, 95% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
5	EY-2(5-6) 13:44	48/48					
6							
7						Contact-gradational	
8					SP	Poorly graded sand with gravel (SP): Very pale orange 10 YR (8/2), very-loose, dry. 15 % fine sub-angular gravel to 3/8"+, 80% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	
9							
10		48/48					
11							
12						T.D. = 12.0' @ 13:46; 12/03/08	
13							
14							
15							
16							
17							
18							
19							
20							

northgate
environmental management, inc.

Northgate Environmental Management
1100 Quail Street, Suite 102
Newport Beach, CA 92660
949.260.9293

Boring Log

Project Number: 2024.01		**Boring ID: EY-3**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	EY-3(0-1) 14:10	48/48					
2							
3							
4					SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose to loose, dry. 5 % fine sub-angular gravel to 1/8"-, 90% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
5	EY-3(5-6) 14:14	48/48					
6							
7							
8							
9		48/48			SP	Coarsening to 10% gravel @ 7.5'	
10							
11							
12						T.D. = 12.0' @ 14:20; 12/03/08	
13							
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Project Number: 2024.01		**Boring ID: EY-4**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	EY-4(0-1) 14:55	48/48			SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), medium-stiff, dry. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	0.1
2							
3							
4					SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose to loose, dry. Trace fine sub-angular gravel to 3/8"+, 95% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
5	EY-4(5-6) 14:57						
6		48/48					
7					SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), medium-stiff, dry. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining. Contact-gradational	0.0
8							
9					SP	Poorly graded sand with gravel (SP): Very pale orange 10 YR (8/2), very-loose, dry. 15 % fine sub-angular gravel to 3/8"+, 80% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	
10		48/48					
11							
12							0.0
13						T.D. = 12.0' @ 15:02; 12/03/08	
14							
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Project Number: 2024.01	Boring ID: EY-5
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/03/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75 / Completed: 12/03/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	EY-5(0-1) 15:36	48/48	X		SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-stiff, moist. 75% fine sub-angular sand, 25% non-plastic fines. No odor or staining.	0.0
4–5					SM	Silty sand (SM): Pale brown 5 Y (5/2), medium-stiff, dry. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
5–8	EY-5(5-6) 15:42	48/48	X		SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose, moist. 5% fine sub-angular gravel to 3/8"+, 90% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	0.0
8–12	EY-5(10-11) 15:49	48/48	X		SP		0.0
12						T.D. = 12.0' @ 15:52; 12/03/08	

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Project Number: 2024.01		**Boring ID: I_4B**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 16**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 16

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_4B(0-1) 09:47	48/48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very-loose, damp. 2% fine sub-angular to sub-rounded gravel to 1/2"-, 95% medium to coarse sub-angular sand (15% fine, 50% medium, 35% coarse sand), 5% non-plastic fines. Mild HC odor and staining.	
2							
3							
4							
5	I_4B(5-6) 09:49						
6							
7					SW	Oil staining observed 0' to 7.5'.	
8						Well graded sand (SW): Light brown 5 YR (5/6), loose, damp with oil. 95% subangular sand (75% fine, 25% medium, 0% coarse sand), 5% non-plastic fines. Mild HC odor.	
9	No Recovery-redrilled.				SP	Poorly graded sand with gravel (SP): Grayish orange 10 YR (7/4), loose, dry. 15% fine sub-angular gravel to 1/2"-, 80% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 12' depth.	
10	I_4B(10-11) 10:35	6/48					
11							
12							
13							
14							
15	I_4B(15-16) 10:46	12/48					
16						Refusal in caliche @16'.	
17						T.D. = 16.0' @ 10:48; 12/05/08	
18							
19							
20							

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Project Number: 2024.01		Boring ID: I_12B
Project Name: Sunray Energy		Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental		Logged By: Dana R. Brown
Drilling Method: Geoprobe	Date Started: 12/05/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75	Completed: 12/05/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_12B(0-1) 12:05	48/48			SP		
2						Oil staining observed 0' to 2'.	
3							
4							
5	I_12B(5-6) 12:07	48/48			SP	Poorly graded sand (SP): Moderate yellowish brown 10 YR (5/4), loose, dry. 2% fine sub-angular gravel to 3/8"+, 93% medium to coarse sub-angular sand, 5% non-plastic fines. Vague HC odor.	
6							
7							
8					SP		
9							
10		48/48					
11					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 2% fine sub-angular gravel to 1/2"-, 95% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
12							
13						T.D. = 12.0' @ 12:12; 12/05/08	
14							
15							
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Project Number: 2024.01		**Boring ID: I_17B**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_17B(0-1) 11:19	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, dry to damp. 65% fine sub-angular sand, 35% non-plastic fines. Vague HC odor and visible staining.	
4–5					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. Trace fine sub-angular gravel to 1/2"-, 97% fine to medium sub-angular sand, 3% non-plastic fines. Moderate HC odor and visible staining.	
5–8	I_17B(5-6) 11:22	48/48				Oil staining observed 0' to 5'.	
8–10					SP	At 8', coarsening to 2% gravel, 93% sand 5% non-plastic fines.	
10–12	I_17B(10-11) 11:25	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
12–20						T.D. = 12.0' @ 11:25; 12/05/08	

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Project Number: 2024.01		**Boring ID: I_19E-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_19E-1(0-1) 15:11	48/48			ML	Sandy silt (ML): Pale yellowish brown 10 YR (6/2), loose to medium-stiff, moist. Trace sub-angular gravel to 1/2"-, 80% fine sub-angular sand, 20% non-plastic fines. Mild HC odor and visible staining.	
5–8	I_19E-1(5-6) 15:12	48/48			SP	Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. Trace fine sub-angular gravel to 1/2"-, 95% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 8' depth.	
						Oil staining observed 0' to 8'.	
9–12	I_19E-1(10-11) 15:14	48/48			SP	Coarsening to 5% fine sub-angular gravel to 1/2"- @ 9'.	
13–20						T.D. = 12.0' @ 15:14; 12/02/08	

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Project Number: 2024.01	**Boring ID: I_19E-2**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_19E-2(0-1) 15:21	48/48			ML	Sandy silt (ML): Dark yellowish brown 10 YR (4/2), medium-stiff, moist. Trace sub--angular gravel to 3/8"+, 35% very-fine sub-angular sand, 65% non-plastic fines. Mild HC odor and visible staining.	
5–7	I_19E-2(5-6) 15:23	48/48			SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), medium-dense to loose, dry to damp. Trace sub-angular gravel to 1/2"+, 80% fine sub-angular sand, 20% non-plastic fines. Mild HC odor and visible staining. Contact - gradational	
8–10	I_19E-2(10-11) 15:28	48/48			SP	Oil staining observed 0' to 7.5'. Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. Trace fine sub-angular gravel to 1/2"-, 75% fine to medium sub-angular sand, 25% non-plastic fines. No odor or staining below 7.5' depth.	
11–12					SM	Silty sand (SM): Dark yellowish orange 10 YR (6/6), very-loose to loose, dry. 1% fine sub-angular gravel to 3/8"+, 70% fine to medium sub-angular sand, 30% non-plastic fines. No odor or staining.	
13–20						T.D. = 12.0' @ 15:28; 12/02/08	

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Project Number: 2024.01		**Boring ID: I_20G**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_20G(0-1) 14:27	48/48			SM	Silty sand (SM): Pale brown 5 YR (5/2), loose, damp. 2% fine sub-angular gravel to 1/2"-, 70% fine sub-angular sand, 28% non-plastic fines. Mild HC odor and staining.	
2							
3					ML	Sandy silt (ML): Moderate yellowish brown 10 YR (5/4), medium-stiff, moist. Trace sub-angular gravel to 3/8"+, 35% fine to medium sub-angular sand, 65% non-plastic fines. Moderate HC odor and visible staining.	
4							
5	I_20G(5-6) 14:32				SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), loose, dry. 2% fine sub-angular gravel to 1/2"-, 75% fine sub-angular sand, 23% non-plastic fines. Mild HC odor and staining.	
6							
7					SP	Poorly graded sand with gravel (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 10% fine sub-angular to sub-rounded gravel to 1/2"-, 85% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 9' depth.	
8							
9						Oil staining observed 0' to 9'.	
10	I_20G(10-11) 14:34						
11							
12							
13						T.D. = 12.0' @ 14:35; 12/02/08	
14							
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Project Number: 2024.01		**Boring ID: I_23B**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_23B(0-1) 08:22	46/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. Trace sub-angular gravel to 3/8"+, 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and visible staining.	
5–8	I_23B(5-6) 08:24	46/48			SP	Oil staining observed 0' to 5'. Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. 2% fine sub-angular gravel to 1/2", 93% fine to medium subangular sand, 5% non-plastic fines. No odor or staining below 5' depth.	
9–12	I_23B(10-11) 08:32	46/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine sub-angular sand, 30% non-plastic fines. No odor or staining.	
13–20						T.D. = 12.0' @ 08:34; 12/03/08	

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Project Number: 2024.01		**Boring ID: I_23B/C**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_23B/C(0-1) 07:59	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. Trace sub-angular gravel to 3/8"+, 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and visible staining.	
5–8	I_23B/C(5-6) 08:03	48/48			SP	Oil staining observed 0' to 7.5'. Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. 2% fine sub-angular gravel to 1/2", 95% fine to medium subangular sand, 3% non-plastic fines. No odor or staining below 7.5' depth.	
9–12	I_23B/C(10-11) 08:05	48/48			SM SP	Lens of Silty sand (SM): 9.5' to 10.0'. Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. 5% fine sub-angular gravel to 1/2", 90% fine to medium subangular sand, 5% non-plastic fines. No odor or staining.	
13–20						T.D. = 12.0' @ 08:06; 12/03/08	

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Project Number: 2024.01		**Boring ID: I_23C**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_23C(0-1) 16:13	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, dry to damp. Trace sub-angular gravel to 3/8"+, 65% fine sub-angular sand, 35% non-plastic fines. Mild HC odor and visible staining.	
5–8	I_23C(5-6) 16:16	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. 95 % subangular sand (40% fine, 55% medium, 5% coarse sand), 3% non-plastic fines. No odor or staining below 8' depth.	
8						Oil staining observed 0' to 8'.	
9–12	I_23C(10-11) 16:19	48/48			SW	Well graded sand (SW): Grayish orange 10 YR (7/4), very-loose, dry. 95% sub-angular fine sand, 5% non-plastic fines. No odor or staining.	
12						T.D. = 12.0' @ 16:19; 12/02/08	
13–20							

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Project Number: 2024.01		**Boring ID: I_24F-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	I_24F-1(0-1) 13:31	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose, dry to damp. Trace fine sub-angular to sub-rounded gravel to 3/8"+, 95% fine to medium sub-angular sand, 5 % non-plastic fines. Mild HC odor and visible staining.	
4					SM	Silty sand (SM): Grayish orange pink 5 YR (7/2), loose to medium-dense, damp. 2% sub-angular gravel to 3/8"+, 78% fine sub-angular sand, 20% non-plastic fines. Mild HC odor and visible staining.	
5–7	I_24F-1(5-6) 13:33	48/48			SP	Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 2% fine sub-angular gravel to 1/2"-, 93% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 7' depth.	
						Oil staining observed 0' to 7.5'.	
8–9					SP	Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 5% fine sub-angular to sub-rounded gravel to 1/2"-, 85% fine to medium sub-angular sand, 10 % non-plastic fines. No odor or staining below 7' depth.	
10–11	I_24F-1(10-11) 13:35	48/48			SM	Silty sand (SM): Grayish orange pink 5 YR (7/2), loose to medium-dense, damp. 2% sub-angular gravel to 3/8"+, 78% fine sub-angular sand, 20% non-plastic fines. No odor or staining.	
12						T.D. = 12.0' @ 13:35; 12/02/08	
13–20							

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Project Number: 2024.01		**Boring ID: I_24F-2**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_24F-2(0-1) 13:40	48/48	X		SP	Poorly graded sand with gravel (SP): Light olive gray 5 Y (5/2), very-loose, dry. Trace fine sub-angular gravel to 1/2"-, 95% fine to medium sub-angular sand, 5% non-plastic fines. Mild HC odor and visible staining.	
2							
3							
4							
5	I_24F-2(5-6) 13:45	48/48	X				
6							
7					SP	Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 5% fine sub-angular to sub-rounded gravel to 1/2"-, 90% fine to medium sub-angular sand, 5 % non-plastic fines. No odor or staining below 8.5' depth.	
8							
9						Oil staining observed 0' to 8.5'.	
10	I_24F-2(10-11) 13:50	48/48	X		SP	Increasing to 10% fine sub-angular to sub-rounded gravel to 1/2"- @ 9.5'.	
11							
12						T.D. = 12.0' @ 13:50; 12/02/08	
13							
14							
15							
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19							
20							

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Project Number: 2024.01		**Boring ID: I_28G-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_28G-1(0-1) 14:14	48/48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose, damp with oil. 95 % subangular sand (40% fine, 45% medium, 15% coarse sand), 5% non-plastic fines.	
2							
3					SW	Well graded sand (SW): Light brown 5 YR (5/6), loose, damp with oil. 95% subangular sand (75% fine, 25% medium, 0% coarse sand), 5% non-plastic fines. Mild HC odor.	
4							
5	I_28G-1(5-6) 14:16					Oil staining observed 0' to 5'.	
6							
7		48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), looseto medium-dense, dry. 95 % subangular sand (35% fine, 55% medium, 10% coarse sand), 3% non-plastic fines. No odor or staining below 5' depth.	
8							
9							
10	I_28G-1(10-11) 14:22						
11		48/48			SP	At 9', coarsening to 2% gravel, 95% sand (25% fine, 55% medium, 20% coarse sand), 3% non-plastic fines.	
12						T.D. = 12.0' @ 14:25; 12/05/08	
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Project Number: 2024.01		**Boring ID: I_28G-2**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_28G-2(0-1) 14:34	48 48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose, damp with oil. 95 % subangular sand (40% fine, 45% medium, 15% coarse sand), 5% non-plastic fines.	
2							
3					SW	Well graded sand (SW): Light brown 5 YR (5/6), loose, damp with oil. 95% subangular sand (75% fine, 25% medium, 0% coarse sand), 5% non-plastic fines. Mild HC odor.	
4							
5	I_28G-2(5-6) 14:36	48 48				Oil staining observed 0' to 5'.	
6							
7					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), looseto medium-dense, dry. 95 % subangular sand (35% fine, 55% medium, 10% coarse sand), 3% non-plastic fines. No odor or staining below 5' depth.	
8							
9							
10	I_28G-2(10-11) 14:44	48 48					
11					SP	At 9', coarsening to 2% gravel, 95% sand (25% fine, 55% medium, 20% coarse sand), 3% non-plastic fines.	
12							
13						T.D. = 12.0' @ 14:44; 12/05/08	
14							
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Project Number: 2024.01		**Boring ID: I_29H**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_29H(0-1) 15:08	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, dry to damp. 65% fine sub-angular sand, 35% non-plastic fines. Vague HC odor and visible staining.	
2							
3					SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine sub-angular gravel to 1/2", 96% sub-angular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. Mild HC odor and visible staining.	
4							
5	I_29H(5-6) 15:11	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and staining.	
6						Oil staining observed 0' to 6'.	
7							
8					SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine sub-angular gravel to 1/2", 96% sub-angular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
9					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine sub-angular sand, 30% non-plastic fines. No odor.	
10	I_29H(10-11) 15:15	48/48					
11					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
12						T.D. = 12.0' @ 15:17; 12/05/08	
13							
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Project Number: 2024.01		**Boring ID: I_36B**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_36B(0-1) 09:10	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. Trace sub-angular gravel to 3/8"+, 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and visible staining.	
2							
3							
4					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. 2% fine sub-angular gravel to 1/2", 93% fine to medium subangular sand, 5% non-plastic fines. No odor or staining below 7.8' depth.	
5	I_36B(5-6) 09:12	48/48					
6							
7							
8						Oil staining observed 0' to 7.8'.	
9							
10	I_36B(10-11) 09:14	48/48			SP	At 10', coarsening to 7% gravel, 90% sand, 3% non-plastic fines.	
11							
12						T.D. = 12.0' @ 09:15; 12/03/08	
13							
14							
15							
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18							
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Project Number: 2024.01	**Boring ID: I_55E**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_55E(0-1) 12:00	48 / 48			SW	Well graded sand (SW): Very pale orange 10 YR (8/2), very loose, damp. Trace sub-angular gravel to 1/2", 95% fine sub-angular sand, 5% non-plastic fines. Strong HC odor and staining.	
3–4					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. Trace sub-angular gravel to 3/8"+, 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and visible staining.	
5–8	I_55E(5-6) 12:02	48 / 48			SP	Poorly graded sand (SP): Moderate yellowish brown 10 YR (5/4), very loose, damp to dry. 2% fine sub-angular gravel to 1/2", 93% fine to medium subangular sand, 5% non-plastic fines. No odor or staining below 8'.	
8						Oil staining observed 0' to 8'.	
9–12	I_55E(10-11) 12:09	48 / 48			SP	At 8', coarsening to 5% gravel, 92% sand, 3% non-plastic fines.	
12						T.D. = 12.0' @ 12:10; 12/03/08	

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Project Number: 2024.01		**Boring ID: I_61F-1**
roject Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_61F-1(0-1) 08:00	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), very loose to loose, dry to damp. 80% fine subangular sand, 20% non-plastic fines. Mild HC odor and staining.	
2							
3							
4					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. 95 % subangular sand (35% fine, 55% medium, 10% coarse sand), 3% non-plastic fines. No odor or staining below 7.5' depth.	
5	I_61F-1(5-6) 08:03	48/48					
6							
7							
8						Oil staining observed 0' to 7.5'.	
9							
10	I_61F-1(10-11) 08:12	48/48			SP	At 10', coarsening to 2% gravel, 95% sand, 3% non-plastic fines. Oxidized colors.	
11							
12						T.D. = 12.0' @ 08:15; 12/05/08	
13							
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Project Number: 2024.01	**Boring ID: I_61F-2**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_61F-2(0-1) 08:28	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), very loose to loose, dry to damp. 80% fine subangular sand, 20% non-plastic fines. Mild HC odor and staining.	
2							
3							
4					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. 95 % subangular sand (35% fine, 55% medium, 10% coarse sand), 3% non-plastic fines. No odor or staining below 8' depth.	
5	I_61F-2(5-6) 08:30	48/48					
6							
7							
8						Oil staining observed 0' to 8'.	
9	I_61F-2(10-11) 08:35	48/48			SP	At 10', coarsening to 2% gravel, 95% sand, 3% non-plastic fines. Oxidized colors.	
10							
11							
12						T.D. = 12.0' @ 08:35; 12/05/08	
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14							
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Project Number: 2024.01		**Boring ID: I_73D**
roject Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 16**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 16

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_73D(0-1) 10:22	48/48			SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), loose, moist. 80% fine sub-angular sand, 20% non-plastic fines. Mild HC odor and staining.	
2							
3					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. 5 % fine sub-angular gravel to 3/8"+, 90% fine to medium sub-angular sand, 5% non-plastic fines. Mild HC odor and staining.	
4							
5	I_73D(5-6) 10:24	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), loose, damp. 70% fine subangular sand, 30% non-plastic fines. Mild HC odor and staining.	
6							
7					SP	Poorly graded sand with gravel (SP): Grayish orange 10 YR (7/4), loose, dry. 15% fine sub-angular gravel to 1/2"-, 80% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 12' depth.	
8							
9							
10	I_73D(10-11) 10:26	48/48					
11							
12						Oil staining observed 0' to 12'.	
13							
14		12/48					
15	I_73D(15-16) 10:54						
16						Refusal in caliche @16'.	
17						T.D. = 16.0' @ 10:54; 12/03/08	
18							
19							
20							

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Project Number: 2024.01	Boring ID: I_81E
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/03/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75 / Completed: 12/03/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_81E(0-1) 11:29	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. Trace sub-angular gravel to 1/2", 93% fine to medium subangular sand, 5% non-plastic fines. Strong HC odor and staining.	
5–8	I_81E(5-6) 11:31	48/48			SM / SP / SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. Trace sub-angular gravel to 3/8"+, 70% fine sub-angular sand, 30% non-plastic fines. Mild HC odor and visible staining. Poorly graded sand (SP): same as 3'. Oil staining observed 0' to 7'. Silty sand (SM): same as 5'.	
9–12	I_81E(10-11) 11:34	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, dry. 2% fine sub-angular gravel to 1/2", 93% fine to medium subangular sand, 5% non-plastic fines. No odor or staining. At 11', coarsening to 7% gravel, 90% sand, 3% non-plastic fines.	
13–20						T.D. = 12.0' @ 11:35; 12/03/08	

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Project Number: 2024.01		**Boring ID: I_ET**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/02/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_ET(0-1) 12:35	48/48			SP	Poorly graded sand (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 2% fine sub-angular gravel to 1/2"-, 90% fine to medium sub-angular sand, 8% non-plastic fines. Mild HC odor and visible staining.	
2							
3							
4							
5	I_ET(5-6) 12:40	48/48			SP	Oil staining observed 0' to 5.5'.	
6							
7						Poorly graded sand with gravel (SP): Grayish orange pink 5 YR (7/2), very-loose, dry. 10% fine sub-angular gravel to 1/2"-, 85% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining below 5.5' depth.	
8						Fining to 2% fine sub-angular gravel to 1/2"- @ 8'.	
9							
10	I_ET(10-11) 12:48	48/48					
11							
12						T.D. = 12.0' @ 12:48; 12/02/08	
13							
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Project Number: 2024.01	**Boring ID: I_FRA-1**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/02/08**	**Total Depth (feet): 20**
Borehole Dia. (in): 2.75 / **Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 20

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4		43/48			SM	Silty sand with gravel (SM): Light brownish gray 5 Y (6/1), loose to very-loose, dry to slightly moist. 15% fine sub-angular gravel to 1/2"-, 70% fine sub-angular sand, 15% non-plastic fines. Visible staining and moderate HC odor.	0.8
4–5	I_FRA-1(4-5) 08:10					Less gravel at 1' (10%), decreasing to 2% by 5' bgs.	0.2
5–8		48/48			SP	Gravelly poorly graded sand (SP): Brownish gray 5 YR (4/1), very loose, dry. 25% fine sub-rounded gravel to 1/2"+, 70% medium to coarse sub-angular sand, 5% non-plastic fines. Mild HC odor and staining. Oil staining observed 0' to 8'.	
8–9					SM	Silty sand with gravel (SM): Light brownish gray 5 Y (6/1), loose to very-loose, dry to slightly moist. 15% fine sub-angular gravel to 1/2"-, 70% fine sub-angular sand, 15% non-plastic fines. No odor or staining.	0.0
9–10	I_FRA-1(9-10) 08:30	36/48					
10–12					SP	Poorly graded sand (SP): Pinkish gray 5 YR (8/1), very loose, dry. 5% fine sub-rounded gravel to 3/8"+, 90% medium sub-angular sand, 5% non-plastic fines. Mild No odor or staining.	
12–14							
14–15	I_FRA-1(14-15) 08:36	48/48					0.0
15–16							
16–18		48/48			ML	Sandy Silt (ML): Light brownish gray 5 Y (6/1), very loose, dry. 65% very-fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
18–19							
19–20	I_FRA-1(19-20) 08:42						0.0
						T.D. = 20.0' @ 09:00; 12/02/08	

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Project Number: 2024.01	**Boring ID: I_FRA-2**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/02/08**	**Total Depth (feet): 20**
Borehole Dia. (in): 2.75 / **Completed: 12/02/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 20

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4		48/48			SM	Silty sand (SM): Light olive gray 5 Y (6/1), loose to very-loose, dry to damp. 2% fine sub-angular gravel to 3/8"+, 75% fine sub-angular sand, 23% non-plastic fines. No odor.	0.0
4–8	I_FRA-2(4-5) 09:30	48/48			SP	Poorly graded sand (SP): Light brownish gray 5 YR (6/1), very loose, dry. 5% fine sub-angular gravel to 3/8"+, 90% medium sub-angular sand, 5% non-plastic fines. No odor or staining.	0.0
8–12	I_FRA-2(9-10) 09:35	36/48			SP		0.0
12–15	I_FRA-2(14-15) 09:42	48/48			SM	Silty Sand (SM): Brownish gray 5 YR (4/1), medium-stiff, mosit. Trace fine sub-angular gravel to 3/8"-, 55% fine sub-angular sand, 45% non-plastic fines. No odor or staining.	0.0
15–18		48/48			ML	Sandy Silt (ML): Olive gray 5 Y (4/1), medium-dense, dry to damp. 40% fine to medium sub-angular sand, 60% non-plastic fines. No odor or staining.	
18–20	I_FRA-2(19-20) 09:48				SP	Poorly graded sand (SP): Light brownish gray 5 YR (6/1), very loose, dry. 5% fine sub-angular gravel to 3/8"+, 90% medium sub-angular sand, 5% non-plastic fines. No odor or staining.	0.0
						T.D. = 20.0' @ 09:55; 12/02/08	

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Project Number: 2024.01	Boring ID: I_FRA-3
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/02/08	Total Depth (feet): 20
Borehole Dia. (in): 2.75 / Completed: 12/02/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 20

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3		48/48			SP-SM	Poorly graded sand with silt (SP-SM): Light brown 5 YR (5/6), loose, damp. Trace sub-angular gravel to 3/8"+, 90% fine subangular sand, 10% non-plastic fines. Vague HC odor, visible oil staining.	0.6
4–5	I_FRA-3(4-5) 10:17				SM	Silty sand (SM): Light brown 5 YR (6/4), loose to very-loose, dry. Trace fine sub-rounded gravel to 3/8"+, 65% fine subangular sand, 35% non-plastic fines. Moderate HC odor.	0.9
6–7		48/48				Oil staining observed 0.5' to 7'.	
8–9	I_FRA-3(9-10) 10:52				SM	Fining downward.	0.0
10–11		48/48			ML	Sandy Silt (ML): Light brown 5 YR (6/4), medium-stiff, damp. 15% subangular sand, 85% non-plastic fines. No odor or staining.	0.0
12–15	I_FRA-3(14-15) 11:14	48/48			SP	Poorly graded sand (SP): Light brown 5 YR (6/4), very loose, dry. 5% fine sub-angular to sub-rounded gravel to 1/2", 90% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining.	0.0
16–18		48/48					
19–20	I_FRA-3(19-20) 11:30						
						T.D. = 20.0' @ 11:30; 12/02/08	

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Project Number: 2024.01		**Boring ID: I_SP-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	I_SP-1(0-1) 15:47	48/48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. Trace fine sub-angular gravel to 1/2", 95% sub-angular sand (55% fine, 35% medium, 10% coarse sand), 5% non-plastic fines. No odor.	
4–5					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine sub-angular sand, 30% non-plastic fines. No odor.	
5–6	I_SP-1(5-6) 15:49	48/48			MH	Sandy elastic silt (ML): Dark yellowish brown 10 YR (4/2), dense, moist. 35% fine sub-angular sand, 65% non to moderate-plastic fines. No odor.	
7–8					SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine sub-angular gravel to 1/2", 96% sub-angular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
8–9					MH	Sandy elastic silt (ML): Dark yellowish brown 10 YR (4/2), dense, moist. 35% fine sub-angular sand, 65% non to moderate-plastic fines. No odor or staining.	
9–12		48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
12						T.D. = 12.0' @ 15:52; 12/05/08	
13–20							

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Project Number: 2024.01	**Boring ID: I_SP-2**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	I_SP-2(0-1) 16:00	48/48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. Trace fine sub-angular gravel to 1/2", 95% sub-angular sand (55% fine, 35% medium, 10% coarse sand), 5% non-plastic fines. No odor.	
4–5					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine sub-angular sand, 30% non-plastic fines. No odor.	
5–6	I_SP-2(5-6) 16:05	48/48			MH	Sandy elastic silt (ML): Dark yellowish brown 10 YR (4/2), dense, moist. 35% fine sub-angular sand, 65% non to moderate-plastic fines. No odor.	
7–8					SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine sub-angular gravel to 1/2", 96% sub-angular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
9					MH	Sandy elastic silt (ML): Dark yellowish brown 10 YR (4/2), dense, moist. 35% fine sub-angular sand, 65% non to moderate-plastic fines. No odor or staining.	
10–12	I_SP-2(10-11) 16:09	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
13–20						T.D. = 12.0' @ 16:10; 12/05/08	

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Project Number: 2024.01		**Boring ID: II_1P**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_1P(0-1) 07:45	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine subangular sand, 30% non-plastic fines. Mild HC odor and staining.	
2						Oil staining observed 0' to 1.5'.	
3							
4					SP	Poorly graded SAND (SP): Grayish orange 10 YR (7/4), very loose to loose, dry to damp. 2% fine subangular gravel to 1/2", 95% subangular sand (35% fine, 50% medium, 15% coarse sand), 3% non-plastic fines. No odor or staining.	
5	II_1P(5-6) 07:48	48/48					
6							
7							
8					SP	At 7.5', coarsening to 5% gravel, 90% sand, 5% non-plastic fines.	
9							
10		48/48					
11					SP	At 10', coarsening to 7% gravel, 90% sand, 3% non-plastic fines.	
12						T.D. = 12.0' @ 07:35; 12/06/08	
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Project Number: 2024.01		**Boring ID: II_1R**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 8**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 8

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_1R(0-1) 08:08	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose, damp. 95% fine subangular sand, 5% non-plastic fines. HC odor and staining.	
2					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), very loose to loose, dry to damp. 65% fine subangular sand, 35% non-plastic fines. Mild HC odor and staining.	
3							
4						Oil staining observed 0' to 3.5'.	
5	II_1R(5-6) 08:14	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), very loose to loose, dry to damp. 2% fine subangular gravel to 1/2", 95% subangular sand (35% fine, 50% medium, 15% coarse sand), 3% non-plastic fines. No odor or staining.	
6							
7						At 7', coarsening to 2% gravel.	
8						T.D. = 8.0' @ 08:14; 12/06/08	
9							
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Project Number: 2024.01		**Boring ID: II_5G**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_5G(0-1) 12:14	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, moist. 2% fine sub-angular gravel to 3/8"+, 95% fine to medium sub-angular sand, 5% non-plastic fines. Strong HC odor and visible staining.	
5–6	II_5G(5-6) 12:16	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), dense, moist. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
7–8					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense to loose, damp to dry. 5% sub-angular gravel to 1/2", 90% sand (15% fine, 40% medium, 45% coarse sand), 5% non-plastic fines. No odor or staining below 9.0'.	
9						Oil staining observed 0' to 9'.	
10–12	II_5G(10-11) 12:18	48/48			SP		
13–20						T.D. = 12.0' @ 12:20; 12/04/08	

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Project Number: 2024.01	**Boring ID: II_10I**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_10I(0-1) 11:50	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), dense, moist. 65% fine sub-angular sand, 35% non-plastic fines. Moderate HC odor and visible staining.	
5–8	II_10I(5-6) 11:54	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense to loose, damp to dry. Trace sub-angular gravel to 1/2"-, 95% sand (35% fine, 50% medium, 15% coarse sand), 5% non-plastic fines. No odor or staining below 6.5'.	
						Oil staining observed 0' to 6.5'.	
9–12	II_10I(10-11) 11:58	48/48			SP	At 9', coarsening to 5% gravel, 90% sand (25% fine, 40% medium, 35% coarse sand), 5% non-plastic fines.	
13–20						T.D. = 12.0' @ 12:00; 12/04/08	

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Project Number: 2024.01		**Boring ID: II_14J**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 20**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 20

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_14J(0-1) 13:45	48/48			SM	Silty sand (SM): Light olive gray 5 Y (6/1), loose to very-loose, dry to damp.65% fine sub-angular sand, 35% non-plastic fines. Mild HC odor and visible staining.	
5–8	II_14J(5-6) 13:47	48/48			SP	Poorly graded sand (SP): Light brownish gray 5 YR (6/1), very loose, dry. Trace fine sub-angular gravel to 3/8"+, 95% medium sub-angular sand, 5% non-plastic fines. No odor or staining.	
9–12	II_14J(10-11) 13:49	36/48			SP	At 11', coarsening to 2% gravel, 95% sand, 3% non-plastic fines.	
13						Oil staining observed 0' to 12.8'.	
14–16	II_14J(15-16) 13:59	48/48					
17–20	II_14J(19-20) 14:04	48/48			SP	At 16', coarsening to 5% gravel, 90% sand, 5% non-plastic fines.	
						T.D. = 20.0' @ 14:10; 12/04/08	

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Boring Log

Project Number: 2024.01	Boring ID: I_17E
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/05/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75 / Completed: 12/05/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	I_17E(0-1) 13:21	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), very loose to loose, dry to damp. 80% fine subangular sand, 20% non-plastic fines. Mild HC odor and staining.	
2							
3					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), looseto medium-dense, dry. 95 % subangular sand (35% fine, 55% medium, 10% coarse sand), 3% non-plastic fines. No odor or staining below 5' depth.	
4							
5						Oil staining observed 0' to 5'.	
6	I_17E(5-6) 13:22	48/48			SP	At 5.5', coarsening to 2% gravel, 95% sand (10% fine, 60% medium, 30% coarse sand), 3% non-plastic fines.	
7							
8							
9					SP	At 9.5', coarsening to 2% gravel, 95% sand (25% fine, 55% medium, 20% coarse sand), 3% non-plastic fines.	
10	I_17E(10-11) 13:35	48/48					
11							
12						T.D. = 12.0' @ 13:35; 12/05/08	
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Project Number: 2024.01		**Boring ID: II_21I-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 8**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 8

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_21I-1(0-1) 11:05	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose to loose, moist. 95% fine to medium sub-angular sand, 5% non-plastic fines. Moderate HC odor and visible staining.	
2						Oil staining observed 0' to 2'.	
3					SM	Silty sand (SM): Light brownish gray 5 YR (6/1), dense, damp. 60% fine sub-angular sand, 40% non-plastic fines. Moderate HC odor no staining. Some caliche grains.	
4							
5	II_21I-1(5-6) 11:08	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose to loose, moist. 2% fine sub-angular gravel to 1/2"-, 95% fine to medium sub-angular sand, 3% non-plastic fines. No odor. Locally with oxidized colors (orange, kidney-red, reddish-tan).	
6							
7							
8						T.D. = 8' @ 11:10; 12/04/08	
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Boring Log

Project Number: 2024.01	Boring ID: II_21I-2
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/04/08	Total Depth (feet): 8
Borehole Dia. (in): 2.75 / Completed: 12/04/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 8

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_21I-2(0-1) 11:22	48/48			SW-SM	Well graded sand with silt (SW-SM): Pale yellowish brown 10 YR (6/2), medium-stiff, moist. 90% fine sub-angular sand, 10% non-plastic fines. Mild HC odor and visible staining.	
2						Oil staining observed 0' to 2.5'.	
3					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, moist. 60% fine sub-angular sand, 40% non-plastic fines. Some black (MnO?) staining & oxidation colors (reddish-orange, kidney-red, purple).	
4							
5	II_21I-2(5-6) 11:29	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose to loose, moist. Trace fine sub-angular gravel to 1/2"-, 95% fine to medium sub-angular sand, 5 % non-plastic fines. No odor. Locally with oxidized colors (orange, kidney-red, reddish-tan).	
6							
7							
8						T.D. = 8' @ 11:30; 12/04/08	
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Project Number: 2024.01		**Boring ID: II_21O**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_21O(0-1) 09:15	48/48			SP	Oil staining observed 0' to 2.5'.	
2							
3							
4						Poorly graded SAND (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine subangular gravel to 1/2", 96% subangular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
5	II_21O(5-6) 09:22						
6							
7		48/48					
8							
9						At 9', coarsening to 2% gravel, 93% sand (15% fine, 40% medium, 45% coarse sand), 5% non-plastic fines.	
10		48/48					
11							
12							
13						T.D. = 12.0' @ 10:15; 12/06/08	
14							
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Project Number: 2024.01	**Boring ID: II_23Q**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/06/08**	**Total Depth (feet): 8**
Borehole Dia. (in): 2.75 / **Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 8

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_23Q(0-1) 09:35	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), very loose to loose, dry to damp. 70% fine subangular sand, 30% non-plastic fines. Mild HC odor and staining.	
2							
3						Oil staining observed 0' to 2.5'.	
4					SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose, dry. 95% subangular sand (40% fine, 35% medium, 25% coarse sand), 5% non-plastic fines. No odor or staining below 2.5'.	
5	II_23Q(5-6) 09:37						
6		48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), looseto medium-dense, dry. 2% fine subangular gravel to 1/2", 95% subangular sand (25% fine, 45% medium, 30% coarse sand), 3% non-plastic fines. No odor or staining.	
7							
8						T.D. = 8.0' @ 09:37; 12/06/08	
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Project Number: 2024.01	**Boring ID: II_27A**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_27A(0-1) 09:29	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), medium-dense to loose, moist. 60 % fine sub-angular sand, 40% non-plastic fines. Strong HC odor and visible staining.	
2							
3					SP	Poorly graded sand (SP): Yellowish gray 5 Y (8/1), very-loose, moist. 95 % fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining.	
4						Oil staining observed 0' to 4'.	
5	No Recovery (4' - 8')	0/48			SP?		
6							
7							
8							
9	II_27H(10-11) 09:33	48/48			SP	Poorly graded sand with gravel (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 15% fine sub-angular gravel to 1/2"-, 80% sand (35% fine, 50% medium, 15% coarse sand), 5% non-plastic fines. No odor.	
10							
11							
12						T.D. = 12.0' @ 10:05; 12/04/08	
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Project Number: 2024.01	**Boring ID: II_27H**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75 / **Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_27H(0-1) 10:47	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), dense, moist. 65% fine sub-angular sand, 35% non-plastic fines. Moderate HC odor and visible staining.	
5–6	II_27H(5-6) 10:49	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense to loose, damp to dry. Trace sub-angular gravel to 1/2"-, 95% sand (35% fine, 50% medium, 15% coarse sand), 5% non-plastic fines. No odor or staining below 6.5'.	
6–7						Oil staining observed 0' to 6.5'.	
7–8					SP	At 7.5', coarsening to 5% gravel, 90% sand (25% fine, 40% medium, 35% coarse sand), 5% non-plastic fines.	
9–12	II_27H(10-11) 10:51	48/48			SP		
12						T.D. = 12.0' @ 10:55; 12/04/08	
13–20							

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Project Number: 2024.01	**Boring ID: II_31A**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/05/08**	**Total Depth (feet): 16**
Borehole Dia. (in): 2.75 / **Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 16

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	II_31A(0-1) 08:37	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, damp. 65% fine subangular sand, 35% non-plastic fines. Mild HC odor and staining.	
4–8	II_31A(5-6) 08:41	48/48			SP	Poorly graded sand (SP): Moderate yellowish brown 10 YR (5/4), very loose to loose, damp. Trace fine subangular gravel to 3/8"+, 95% subangular sand (35% fine, 55% medium, 10% coarse sand), 5% non-plastic fines. Strong HC odor and visible staining. At 7', coarsening to 2% gravel.	
9–12	II_31A(10-11) 08:44	48/48			SP	Oil staining observed 0' to 10.5'. Gravel lens from 11' to 12'.	
13–16	II_31A(15-16) 08:49	48/48			SP	Becoming medium-dense @ 13' and fining to mostly fine sand.	
16						T.D. = 16.0' @ 08:50; 12/04/08	
17–20							

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Project Number: 2024.01	**Boring ID: II_36K**
Project Name: Sunray Energy	**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental	**Logged By: Dana R. Brown**
Drilling Method: Geoprobe / **Date Started: 12/04/08**	**Total Depth (feet): 16**
Borehole Dia. (in): 2.75 / **Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 16

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	II_36K(0-1) 14:42	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, damp. 75% fine subangular sand, 25% non-plastic fines. Strong HC odor and staining.	
4					SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very loose, damp. Trace fine subangular gravel to 3/8"+, 95% subangular sand (75% fine, 25% medium sand), 5% non-plastic fines. Strong HC odor and visible staining.	
5–6	II_36K(5-6) 14:44	48/48					
7					SM	Silty sand (SM): as at 2' but moderate yellowish brown 10 YR (5/4).	
8					SP	Sandy silt (ML): Dark yellowish brown 10 YR (4/2), medium-stiff, damp. 25% fine sub-angular sand, 75% non-plastic fines. Strong HC odor and visible staining.	
9–11	II_36K(10-11) 14:48	48/48			SW	Well graded sand (SW): Light brown 5 YR (5/6), loose, damp with oil. 95% subangular sand (75% fine, 25% medium, 0% coarse sand), 5% non-plastic fines. Mild HC odor.	
12–14		48/48				Oil staining observed 0' to 14'.	
15–16	II_36K(15-16) 15:05					Some caliche as grain coatings 14' to 16'.	
17–20						T.D. = 16.0' @ 15:10; 12/04/08	

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Project Number: 2024.01		**Boring ID: II_37H**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_37H(0-1) 09:57	48/48	X		SP-SM	Poorly graded sand with silt (SP-SM): Moderate yellowish brown 10 YR (5/4), loose to very-loose, moist. 90% fine sub-angular sand, 10% non-plastic fines. Strong HC odor and visible staining.	
5–8	II_37H(5-6) 09:59	48/48	X		SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), medium-dense to loose, moist. 60 % fine sub-angular sand, 40% non-plastic fines. Strong HC odor and visible staining.	
						Oil staining observed 0' to 8'.	
9–12	II_37H(10-11) 10:02	48/48	X		SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 2% fine sub-angular gravel to 1/2"-, 95% sand (35% fine, 50% medium, 15% coarse sand), 3% non-plastic fines. Vague HC odor.	
13–20						T.D. = 12.0' @ 10:05; 12/04/08	

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Project Number: 2024.01		**Boring ID: II_39D**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	II_39D(0-1) 08:04	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense to loose, dry to damp. 65% fine sub-angular sand, 35% non-plastic fines. Vague HC odor and visible staining.	
4–8	II_39D(5-6) 08:06	48/48			SP	Poorly graded sand (SP): Moderate yellowish brown 10 YR (5/4), loose, dry. 2% fine sub-angular gravel to 3/8"+, 93% medium to coarse sub-angular sand, 5% non-plastic fines. Vague HC odor.	
7						Oil staining observed 0' to 6.8'.	
8					SP		
9					SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-dense, damp. 65% fine sub-angular sand, 35% non-plastic fines. No odor.	
10–12	II_39D(10-11) 08:10	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
12						T.D. = 12.0' @ 08:10; 12/04/08	
13–20							

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Project Number: 2024.01		**Boring ID: II_40K**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/05/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/05/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	II_40K(0-1) 16:37	48/36			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/2), very loose to loose, dry to damp. 70% fine subangular sand, 30% non-plastic fines. Mild HC odor and staining.	
4–8	II_40K(5-6) 16:39	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), loose to medium-dense, dry. 95 % fine to medium sub-angular sand, 3% non-plastic fines. No odor or staining below 6.5' depth.	
						Oil staining observed 0' to 6.5'.	
8–12	II_40K(10-11) 16:46	48/48			SP	At 9', coarsening to 5% gravel, with traces of caliche on bedding surfaces.	
12–20						T.D. = 12.0' @ 16:46; 12/03/08	

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Project Number: 2024.01		**Boring ID: II_87T**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/03/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/03/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_87T(0-1) 16:13	48/48			SM	Silty sand (SM): Pale yellowish brown 10 YR (6/2), medium-stiff, dry. 65% fine sub-angular sand, 35% non-plastic fines. Mild HC odor and visible staining.	
2							
3						Oil staining observed 0' to 2.5'.	
4							
5	II_87T(5-6) 16:15	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose to loose, dry. Trace fine sub-angular gravel to 3/8"+, 95% fine to medium subangular sand, 5% non-plastic fines. No odor or staining below 2.5'.	
6							
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9		48/48					
10							
11							
12						T.D. = 12.0' @ 16:15; 12/03/08	
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Project Number: 2024.01		**Boring ID: II_CT-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_CT-1(0-1) 16:11	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-stiff, moist. 75% fine sub-angular sand, 25% non-plastic fines. No odor or staining.	
2					SW	Well graded sand (SW): Pale yellowish brown 10 YR (6/2), very-loose, moist. 95% fine sub-angular sand, 5% non-plastic fines. No odor or staining.	
3							
4					SP	Poorly graded sand (SP): Yellowish gray 5 Y (8/1), very-loose, moist. 95% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining.	
5	II_CT-1(5-6) 16:13	48/48			SM	Silty sand (SM): Dark yellowish brown 10 YR (4/2), dense, moist. 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
6							
7							
8							
9	II_CT-1(10-11) 16:16	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose, moist. 5% fine sub-angular gravel to 3/8"+, 90% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	
10							
11							
12						T.D. = 12.0' @ 16:20; 12/04/08	
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Project Number: 2024.01	Boring ID: II_CT-2
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/04/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75 / Completed: 12/04/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	II_CT-2(0-1) 15:49	48/48			SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-stiff, moist. 75% fine sub-angular sand, 25% non-plastic fines. No odor or staining.	
4–8	II_CT-2(5-6) 15:52	48/48			SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose, moist. Trace fine sub-angular gravel to 3/8"+, 95% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining.	
8–12	II_CT-2(10-11) 15:57	48/48			SP	At 9', coarsening to 5% gravel, 90% sand (15% fine, 40% medium, 45% coarse sand), 5% non-plastic fines.	
12						T.D. = 12.0' @ 15:59; 12/04/08	
13–20							

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Project Number: 2024.01		**Boring ID: II_CT-3**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/04/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/04/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–3	II_CT-3(0-1) 16:25	48/48	X		SM	Silty sand (SM): Moderate yellowish brown 10 YR (5/4), medium-stiff, moist. 75% fine sub-angular sand, 25% non-plastic fines. No odor or staining.	
4					SP	Poorly graded sand (SP): Yellowish gray 5 Y (8/1), very-loose, moist. 95% fine to medium sub-angular sand, 5% non-plastic fines. No odor or staining.	
5–6	II_CT-3(5-6) 16:29	48/48	X		SP	Poorly graded sand (SP): Pale yellowish brown 10 YR (6/2), very-loose, moist. 5% fine sub-angular gravel to 3/8"+, 90% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	
7–8					ML	Sandy silt (ML): Dark yellowish brown 10 YR (4/2), dense, moist. 45% fine sub-angular sand, 55% non-plastic fines. No odor or staining.	
9–11	II_CT-3(10-11) 16:39	48/48	X		SP	Poorly graded sand with gravel (SP): Pale yellowish brown 10 YR (6/2), very-loose, moist. 15% fine sub-angular gravel to 3/8"+, 80% fine to coarse subangular sand, 5% non-plastic fines. No odor or staining.	
12						T.D. = 12.0' @ 16:40; 12/04/08	
13–20							

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Boring Log

Project Number: 2024.01	Boring ID: II_PB-1
Project Name: Sunray Energy	Location: 35100 Santa Fe Road, Dagget, CA
Drilling Contractor: Interphase Environmental	Logged By: Dana R. Brown
Drilling Method: Geoprobe / Date Started: 12/05/08	Total Depth (feet): 12
Borehole Dia. (in): 2.75 / Completed: 12/05/08	Depth to Water: N/A

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_PB-1(0-1) 16:25	48/48			SP	Poorly graded sand (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. Trace fine sub-angular gravel to 1/2", 95% sub-angular sand (55% fine, 35% medium, 10% coarse sand), 5% non-plastic fines. Strong HC odor and visible staining.	
2							
3							
4						Oil staining observed 0' to 4'.	
5	II_PB-1(5-6) 16:45	12/48			SP	Poorly graded sand (SP), as above. No staining below 5'.	
6						Note: Interval 5' - 6' not recovered during initial boring. Moved rig 2' north and re-drilled recovering sample from 5' - 6' interval.	
7							
8							
9							
10	II_PB-1(10-11) 16:30	48/48			SP	Poorly graded sand (SP): Grayish orange 10 YR (7/4), medium-dense, dry. 5% fine sub-angular gravel to 1/2"-, 92% fine to medium sub-angular sand, 3% non-plastic fines. No odor.	
11							
12						T.D. = 12.0' @ 16:45; 12/05/08	
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Project Number: 2024.01		**Boring ID: II_SP-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_SP-1(0-1) 08:28	48/48	X		SW	Well graded SAND (SW): Very pale orange 10 YR (8/2), very loose, damp. 98% fine subangular sand, 2% non-plastic fines. No odor or staining.	
2							
3							
4							
5	II_SP-1(5-6) 08:33	48/48	X		SP	Poorly graded SAND with gravel (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine subangular gravel to 1/2"-, 92% subangular sand (25% fine, 45% medium, 30% coarse sand), 3% non-plastic fines. No odor or staining.	
6							
7							
8							
9		48/48				Increasing to 7% gravel @ 7.5'.	
10							
11							
12						T.D. = 12.0' @ 08:38; 12/06/08	
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Project Number: 2024.01		**Boring ID: II_SP-2**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1	II_SP-2(0-1) 08:45	48/48			SP	Poorly graded SAND (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 2% fine subangular gravel to 1/2"-, 96% subangular sand (35% fine, 45% medium, 20% coarse sand), 2% non-plastic fines. No odor or staining.	
2							
3							
4							
5	II_SP-2(5-6) 08:51	48/48					
6							
7							
8							
9		48/48				Increasing to 5% gravel @ 7.5'.	
10							
11							
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13						T.D. = 12.0' @ 08:55; 12/06/08	
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Project Number: 2024.01		**Boring ID: TDA-1**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–4	TDA-1(0-1) 10:04	48/48	X		SM	Silty SAND (SM): Grayish orange 10 YR (7/4), medium-dense, wet from surface to 0.5', dry below. Trace fine sub-anglar gravel to 3/8"+, 65% fine sub-angular sand, 35% non-plastic fines. No odor or staining.	
5–8	TDA-1(5-6) 10:07	48/48	X		SP	Poorly graded SAND (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine subangular gravel to 1/2", 96% subangular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
9–12		48/48			SP	Coarsening to Poorly graded sand with gravel (SP): 7% fine subangular gravel to 1/2", 91% subangular sand (25% fine, 55% medium, 20% coarse sand), 2% non-plastic fines. No odor or staining.	
13–20						T.D. = 12.0' @ 10:15; 12/06/08	

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Newport Beach, CA 92660
949.260.9293

Project Number: 2024.01		**Boring ID: TDA-2**
Project Name: Sunray Energy		**Location: 35100 Santa Fe Road, Dagget, CA**
Drilling Contractor: Interphase Environmental		**Logged By: Dana R. Brown**
Drilling Method: Geoprobe	**Date Started: 12/06/08**	**Total Depth (feet): 12**
Borehole Dia. (in): 2.75	**Completed: 12/06/08**	**Depth to Water: N/A**

Surface Seal Type: Amorphous Bentonite
Interval (ft bgs): 0 - 12

Remarks:
Core samples recovered in acetate liners.

Depth (ft)	Sample ID & Sample Time	Recovery %	Sample Int.	Graphic Log	USCS Code	Material Description	PID (ppm)
1–2	TDA-2(0-1) 10:22	48/48			SM	Silty SAND (SM): Grayish orange pink 5 YR (7/2), loose to medium-dense, dry. 60% fine sub-angular sand, 40% non-plastic fines. No odor or staining. Some fine caliche grains on bedding surfaces.	
3–4					SW	Well graded SAND (SP): Very pale orange 10 YR (8/2), very loose to loose, dry. 95% fine subangular sand, 5% non-plastic fines. No odor or staining.	
5–6	TDA-2(5-6) 10:27	48/48			SM	Silty SAND (SM): Grayish orange pink 5 YR (7/2), medium-dense, dry. 75% fine sub-angular sand, 25% non-plastic fines. No odor or staining.	
7–10		48/48			SP	Poorly graded SAND (SP): Very pale orange 10 YR (8/2), very loose to loose, dry to damp. 5% fine subangular gravel to 1/2", 96% subangular sand (25% fine, 50% medium, 25% coarse sand), 2% non-plastic fines. No odor or staining.	
11–12						T.D. = 12.0' @ 10:35; 12/06/08	
13–20							

APPENDIX D
LABORATORY RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
17461 Derian Avenue, Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

LABORATORY REPORT

Prepared For: Northgate Environmental Management
1100 Quail Street Suite 102
Newport Beach, CA 92660
Attention: Derrick Willis

Project: Solar Energy Generating System
2024.01.01S-01

Sampled: 12/02/08
Received: 12/02/08
Issued: 12/05/08 08:57

NELAP #01108CA California ELAP#2706 CSDLAC #10256 AZ #AZ0671 NV #CA01531

CASE NARRATIVE

SAMPLE RECEIPT: Samples were received intact, at 4°C, on ice and with chain of custody documentation. Any tests that had not been analyzed for samples IRK0275-07, -08, -11 and -12 were requested to be set to Hold status per client on 12/03/08. All TPH and Therminol tests had been extracted, but were then put on Hold. The BTEX tests had been done for samples IRK0275-07 and -08, but the other two samples were put on Hold. Additional EPA 8270C-SVOC tests were requested by client on 12/03/08 for samples IRK0275-05, -06, -09 and -10.

HOLDING TIMES: All samples were analyzed within prescribed holding times and/or in accordance with the TestAmerica Sample Acceptance Policy unless otherwise noted in the report.

PRESERVATION: Samples requiring preservation were verified prior to sample analysis.

QA/QC CRITERIA: All analyses met method criteria, except as noted in the report with data qualifiers. Selected surrogate concentrations were diluted below detection limits due to sample dilution for target analyte or matrix interference. The affected surrogate concentrations were flagged with Z3 qualifiers.

COMMENTS: Therminol target compounds were reported as 1,1'-Biphenyl (CAS # 92-52-4) and 1,1'-Oxybisbenzene (CAS # 101-84-8, aka Diphenyl oxide).

SUBCONTRACTED: No analyses were subcontracted to an outside laboratory.

LABORATORY ID	CLIENT ID	MATRIX
IRL0275-01	I_FRA-1 (4-5)	Soil
IRL0275-02	I_FRA-1 (9-10)	Soil

TestAmerica Irvine
Patty Mata
Project Manager

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Northgate Environmental Management
1100 Quail Street Suite 102
Newport Beach, CA 92660
Attention: Derrick Willis

Project ID: Solar Energy Generating System
2024.01.01S-01
Report Number: IRL0275

Sampled: 12/02/08
Received: 12/02/08

LABORATORY ID	CLIENT ID	MATRIX
IRL0275-03	I_FRA-1 (14-15)	Soil
IRL0275-04	I_FRA-1 (19-20)	Soil
IRL0275-05	I_FRA-2 (4-5)	Soil
IRL0275-06	I_FRA-2 (9-10)	Soil
IRL0275-07	I_FRA-2 (14-15)	Soil
IRL0275-08	I_FRA-2 (19-20)	Soil
IRL0275-09	I_FRA-3 (4-5)	Soil
IRL0275-10	I_FRA-3 (9-10)	Soil
IRL0275-13	I_ET (4-5)	Soil
IRL0275-14	I_ET (10-11)	Soil
IRL0275-15	I_ET (0-1)	Soil
IRL0275-16	I_24F-1 (0-1)	Soil
IRL0275-17	I_24F-1 (5-6)	Soil
IRL0275-18	I_24F-1 (10-11)	Soil
IRL0275-19	I_24F-2 (0-1)	Soil
IRL0275-20	I_24F-2 (5-6)	Soil
IRL0275-21	I_24F-2 (10-11)	Soil
IRL0275-22	I_20G (0-1)	Soil
IRL0275-23	I_20G (5-6)	Soil
IRL0275-24	I_20G (10-11)	Soil
IRL0275-25	I_19E-1 (0-1)	Soil
IRL0275-26	I_19E-1 (5-6)	Soil
IRL0275-27	I_19E-1 (10-11)	Soil
IRL0275-28	I_19E-2 (0-1)	Soil
IRL0275-29	I_19E-2 (5-6)	Soil
IRL0275-30	I_19E-2 (10-11)	Soil
IRL0275-31	I_23C (0-1)	Soil
IRL0275-32	I_23C (5-6)	Soil
IRL0275-33	I_23C (10-11)	Soil
IRL0275-34	TB-120208	Soil

Reviewed By:

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2024.01.01S-01
Report Number: IRL0275

Sampled: 12/02/08
Received: 12/02/08

THERMINOL (CADHS LUFT/8015B MOD)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IRL0275-01 (I_FRA-1 (4-5) - Soil)								**RL2**
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/4/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/4/2008	
Surrogate: n-Octacosane (40-125%)				*				*Z3*
Sample ID: IRL0275-02 (I_FRA-1 (9-10) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*92 %*				
Sample ID: IRL0275-05 (I_FRA-2 (4-5) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*86 %*				
Sample ID: IRL0275-06 (I_FRA-2 (9-10) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*86 %*				
Sample ID: IRL0275-09 (I_FRA-3 (4-5) - Soil)								**RL2**
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/4/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/4/2008	
Surrogate: n-Octacosane (40-125%)				*				*Z3*
Sample ID: IRL0275-10 (I_FRA-3 (9-10) - Soil)								**RL2**
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	10	ND	5	12/3/2008	12/4/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	10	ND	5	12/3/2008	12/4/2008	
Surrogate: n-Octacosane (40-125%)				*40 %*				*Z3*
Sample ID: IRL0275-13 (I_ET (4-5) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*92 %*				

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Project ID: Solar Energy Generating System
2024.01.01S-01
Report Number: IRL0275

Sampled: 12/02/08
Received: 12/02/08

THERMINOL (CADHS LUFT/8015B MOD)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IRL0275-14 (I_ET (10-11) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*83 %*				
Sample ID: IRL0275-15 (I_ET (0-1) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*				*Z9*
Sample ID: IRL0275-16 (I_24F-1 (0-1) - Soil)								**RL2**
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*				*Z3*
Sample ID: IRL0275-17 (I_24F-1 (5-6) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*78 %*				
Sample ID: IRL0275-18 (I_24F-1 (10-11) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*84 %*				
Sample ID: IRL0275-19 (I_24F-2 (0-1) - Soil)								**RL2**
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	20	ND	10	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*				*Z3*
Sample ID: IRL0275-20 (I_24F-2 (5-6) - Soil)								
Reporting Units: mg/kg								
1,1'-Biphenyl	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
1,1'-Oxybisbenzene	EPA 8015 MOD.	8L02154	2.0	ND	1	12/3/2008	12/3/2008	
Surrogate: n-Octacosane (40-125%)				*88 %*				

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