

1.0 Executive Summary

1.1 Project Overview

CE Obsidian Energy, LLC (Applicant/CE Obsidian) currently possesses a license to construct a geothermal generating plant on an 80-acre site in Imperial County, California. The project was designated as “Salton Sea Unit 6” and was originally granted a license by the California Energy Commission (CEC) in December 2003 for a 185 MW plant. The original 2003 license was amended in May 2005 to enable the plant to increase its capacity to 215 MW (referred to herein as the “original project”). The Applicant petitioned, and the CEC subsequently granted, an extension to the Salton Sea Unit 6 license, making it effective until December 18, 2011.

The Applicant is proposing to amend the currently effective license to allow for the construction of three smaller geothermal plants that will produce a combined total of 159 MW net (nominal) of clean, renewable energy (referred to herein as the “Amended Project”). Both the 185 MW and 215 MW projects proposed using multiple flash geothermal power generating technology, while the Amended Project proposes single flash technology. The single flash technology is simpler, requires considerably less facility infrastructure, and produces a small fraction of the waste compared to multiple flash technology. A more thorough discussion of the design evolution of the Amended Project can be found in Section 4.0. The Amended Project also reduces impacts on wetlands and wildlife.

The Amended Project consists of three geothermal electric power plants (Black Rock Units 1, 2 and 3), each 53 MW net), which will produce a combined 159 MW net of clean, renewable geothermal power. As before, these plants will be operated as “base load” plants. That is, the plants will be in continuous (i.e., 24 hours per day; 7 days per week; 50 plus weeks per year) operation. This is a distinct advantage of geothermal as a renewable source of energy compared to solar and wind. An ancillary benefit is that this type of operation greatly facilitates grid stability and makes dispatching easier for the grid operator. The three units will be co-located on the same site as the original SSU6 project and will share various common auxiliary facilities (see Figure 1-1). The site is currently used for agriculture (see Figure 1-2). Land uses in the surrounding area include existing geothermal power facilities, agriculture, wildlife management (the Sonny Bono Salton Sea National Wildlife Refuge [Wildlife Refuge]).

The original project site was comprised of an 80-acre site bounded on the north by McKendry Road, on the east by Boyle Road, on the west by Severe Road, and on the south by Peterson Road; construction support areas (e.g. laydown and parking) were adjacent to the south. The Amended Project includes the original 80-acre site plus an additional 80 acres adjacent to the south, part of which was used for construction support in the original project. The three power plants will be situated generally in the middle of the site with production well pads on the northern, western, and southern perimeters of the site (see Figure 2-6 in Section 2.0, Project Description).

Each power plant in the Amended Project consists of two major components:

1.0 Executive Summary

- A Resource Production Facility (RPF), consisting of brine production and injection wells and associated pipelines and ancillary facilities, and
- A Power Generating Facility (PGF), consisting of a steam turbine generator, condensers, cooling towers, noncondensable gas handling equipment, and ancillary equipment.

The original SSU6 project facility included 11 production wells on five well pads, three of which were located outside the plant site and eight injection wells on three well pads located south of the plant site. In addition, the original SSU6 project included two plant wells (shallow injection wells dedicated to steam condensate and certain aerated brine) located on the original project site. In contrast, the Amended Project facility will include nine production wells on three well pads on the plant site, nine injection wells on three offsite well pads, and four plant wells located on the plant site.

As with the original project, the Amended Project will require two new transmission lines - the "Midway" and "L" interconnection lines. The configuration of these lines is unchanged from the original SSU6 project. Because the transmission lines are already licensed and will not be modified by the Amended Project, they are only minimally discussed in the Amendment Petition (AP).

The AP relies substantially on the material contained in the original SSU6 project AFC, but also builds upon it. For the convenience of the reader, the AP environmental sections sufficiently incorporates material from the original AFC, particularly in the Affected Environment portions, to enable the reader to develop a full understanding of the context for the Amendment Petition and for the Amended Project itself.

The Amended SSU6 Project will supply energy to California's electric market. A Power Sales Agreement and Interconnection Agreement with the Imperial Irrigation District (IID) for the original SSU6 project were previously cancelled due to construction delay, and a new interconnection process is underway with the IID, that includes a System Impact Study (SIS) to be provided to CEC Staff when it is completed. As of the date of this AP, the Applicant is engaged in active negotiations with potential off takers in the southern California region for the three plants. For Black Rock-1, the Applicant and the off taker have agreed to basic terms. It is expected that a Power Purchasing Agreement (PPA) will be concluded by the second quarter of 2009. Negotiations for Black Rock-2 and -3 are ongoing.

The project will initially be owned by CE Obsidian and operated by CalEnergy Operating Corporation, an affiliate of CEOE, except for the transmission lines. The transmission lines will be constructed, owned, maintained, and operated by IID. It is contemplated that there will ultimately (pre- or post-construction) be three different owners of the three power plants and their associated production and injection wells. Each of those Project owners will likely have their own, separate lenders who will insist that permit compliance conditions be limited to the Project it has lent to. As such, Conditions of Certification should be tailored to provide clear rights and obligations for the three plants with certain overall conditions of compliance remaining the obligation of CE Obsidian.

1.2 Comparison of the Amended Project and the Original SSU6 Project

Figure 1-3 shows and compares the original SSU6 project and the Amended Project. Table 1-1 summarizes major physical and operational differences between the original and Amended Project facilities. In addition to the differences in technology and size mentioned above, primary differences in the layout and configuration are:

- Change in plant size from 80 acres to 160 acres. Including relocation to the plant site of the production well pads and pipelines and differences in injection pipeline lengths, the overall permanent footprint of the Amended Project increases by 27.5 acres;
- Removal of a production well pad located on Obsidian Butte (OB-3);
- Cancellation of the widening of McKendry Road (to serve OB-3);
- Temporary impacts to 34 acres east of the plant site that will be used as a borrow site;
- Change of location and number of production and injection well pads. As discussed below, the original SSU6 project included all production wells and injection wells offsite. In contrast, the Amended Project will locate all production wells onsite. This change from the SSU6 configuration will eliminate approximately one mile of cross-country piping. In addition, while injection wells associated with the Amended Project also will be located off site, they will be located closer to the plant site. This change will eliminate approximately three miles of cross-country piping.

Increasing the main plant site from 80 to 160 acres allows for more compact construction of the Amended Project as a whole. This allows for reducing certain direct and indirect impacts that might have potentially been encountered by the original project. Examples of this include:

- Relocation of all of the production wells (OB-1, 2, and 3) and their associated pipelines to the main plant site. This reduces impacts to proximate wetlands and wildlife refuge areas associated with construction and operations and avoids impacts to a culturally sensitive area..
- Allowing for certain operating infrastructure to be shared by all three plants. This reduces impacts associated with construction by eliminating redundant facilities.
- Using the plant site proper for laydown and construction parking. This mitigates temporary impacts from these activities, as these areas were previously not slated for location on the main plant site.
- Allowing for the construction of a single, shared stormwater detention basin.

The Amended Project will necessitate the creation of a "borrow" site from which earth will be excavated for construction of the site perimeter berm. As discussed elsewhere, this site will be restored to its original condition with topsoil stripped from the main plant site during site initial site grading operations.

The changes from the original project described above, combined with the physical and operational changes discussed in Table 1-1 below resulted in an Amended Project that has important advantages compared to the original project. The Amended Project involves multiple smaller units using simpler single flash technology compared to one much larger unit with more complex multiple flash technology; these differences reduce financial risk and enhance operational flexibility. There are environmental advantages as well, as discussed in Section 1.5 below. For example, the different generating technology combined with different air pollution control technology substantially reduce solid waste volumes and also reduce emissions of various pollutants compared to the original project. Also, relocating production well pads and their pipelines from Obsidian Butte to the plant site reduces impacts to wetlands and sensitive wildlife species habitat and avoids impacts to the culturally sensitive Obsidian Butte area.

Table 1-1 Summary of Major Physical and Operational Changes

Original SSU6 Project	Amended Project
One geothermal power plant with 215-MW (gross) capacity. The power block was located in the northern portion of the plant site.	Three 59-MW (gross), geothermal power plants; 159-MW (net) total capacity. The power blocks are located in the center of the site.
Multiple flash technology	Single flash technology
Eleven production wells on five well pads and eight injection wells on three well pads all of which would be located offsite. Two of the production well pads were planned to be located contiguous to the Wildlife Refuge; the pipeline from the third well pad would have affected culturally-sensitive materials associated with Obsidian Butte.	Nine production wells on three well pads all within the plant site. Nine offsite injection wells on three well pads, but at different locations than the original Project. No wells proximate to the Wildlife Refuge. Production or Injection Butte and injection well pipelines are shorter than the original proposal.
Plant operations required that brine be diluted prior to reinjection. Dilution consumed water and dilution water heaters consumed fuel and produced air emissions.	Brine injected immediately following steam flash with no or minimal dilution, and thus minimal dilution water use, and no dilution water heaters or associated air emissions.
Plant operations would have generated 142 tons per day of silica filter cake, which would have required landfill disposal off site (material handling on site and truck transport, both generating air emissions).	Single flash process will generate no silica waste during normal operation, thus no water consumed for dilution, no dilution water heaters or associated emissions, no truck transport of waste, and minimal landfill use.
Project would have used LO-CAT and Sulfurite technology for hydrogen sulfide control. It would have generated three tons per day of sulfur requiring landfill disposal (i.e., onsite waste handling and offsite transport, both generating air emissions). LO-CAT-Sulfurite does not control volatile organic compound (VOC), benzene or ammonia emissions and requires additional complicated processes to control these pollutants.	The Amended Project proposes Recuperative Thermal Oxidizer (RTO) for Noncondensable Gases (NCG) control. The RTO avoids the sulfur waste. RTO reduces emissions of hydrogen sulfide, VOC, benzene, methane, and ammonia by 95 percent.

1.3 Project Location and Description

The Amended Project plant site is located in the Imperial Valley on a 160-acre parcel (APN 020-110-08) within an unincorporated area of Imperial County, California, southeast of the Salton Sea. The Imperial Valley is the southwest part of the Colorado Desert that merges northwestward into the Coachella Valley near the northern shore of the Salton Sea. The plant site is bounded by McKendry Road to the north, Severe Road to the west, Peterson Road to the south, and Boyle Road to the east.

The town of Calipatria is approximately six miles to the southeast and the town of Niland is approximately 7.5 miles northeast of the plant site. The Wildlife Refuge headquarters is approximately 0.8 mile from the plant site. The Alamo River and New River are approximately 4.8 miles southwest and 2.7 miles east of the plant site, respectively. Nine geothermal power plants owned and operated by CE Generation (an affiliate of the Applicant) are within a two-mile radius of the Amended Project plant site (see Figure 2-2 in Section 2.0, Project Description). Geothermal Power Plant Units 1, 2, 3, 4 and 5 (referred to by CE Generation as

Region 1) are to the southwest of the plant site, the Vulcan and Hoch (Region 2) geothermal plants lie to the southeast, and the J.J. Elmore and Leathers geothermal plants are to the northeast.

Each of the three proposed geothermal power plants consists of two major components, the RPF and the PGF, and various support facilities and equipment. The RPF includes all the brine and steam handling facilities from the production wellheads to the injection wellheads. It also includes a brine injection system, a brine pond, steam polishing equipment designed to provide turbine-quality steam to the PGFs, and appropriate steam-venting vessels to support operations during startup/shutdown and emergency conditions. The PGF includes a condensing turbine/generator set, the NCG removal and abatement systems, and the heat rejection system. The PGF also includes a 230-kilovolt (kV) switchyard and several power distributions centers. Facilities common to the three PGFs include a control building, a service water pond, and other ancillary facilities.

There are three different types of wells associated with the RPF: 1) production wells to extract geothermal fluids; 2) injection wells that receive geothermal brine after heat and steam have been extracted; and 3) plant wells, which are injection wells dedicated to disposal of cooling tower blowdown and reinjection of aerated brine.

There will be nine production wells on three pads (average pad size 6.6 acres, three wells each) on the plant site, and nine injection wells on three pads (average size 4.7 acres, three wells each) off the plant site. The plant site also will include four new plant wells, three dedicated to injection of cooling tower blowdown and one dedicated to injection of aerated brine that accumulates in the brine ponds. Wells will be directionally drilled to minimize the well pad size. The production wells will be drilled to an average depth of approximately 7,400 feet, while the injection wells are expected to be drilled to an average depth of 8,725 feet. A system of aboveground pipelines will be constructed to connect the power generating units with the production and injection wells.

The overall geothermal process is summarized in the following paragraphs. Hot, high-pressure geothermal fluid (brine) is extracted from the geothermal reservoir through the production wells located on the power plant site. The brine flows to a steam handling system consisting of a flash vessel, scrubbers and demisters. At the steam handling system, the steam is separated from the geothermal brine (flashed) to produce high-pressure steam that is sent to the PGF for use in the steam turbine. The depleted brine is chemically conditioned as needed with hydrochloric acid to prevent scale formation in the process piping or injection wells, and injected into the formation through a series of injection wells.

Steam from the RPF is sent to the steam turbine for power generation. The turbine drives a generator. Steam leaving the turbine enters a shell-and-tube heat exchanger that condenses the steam. Cooling water for the heat exchanger is provided by cooling towers. Each PGF will have a dedicated five-cell, mechanical-draft wet cooling tower. Each cooling tower will be equipped with a high efficiency mist eliminator to minimize drift and fine particulate matter (PM10) emissions. Water condensed in the heat exchanger is the source of approximately 95 percent of the cooling water make-up in the cooling tower. The remaining five percent of the total facility water needs will be drawn from the nearby IID canal.

NCGs are evacuated from the heat exchanger using a vacuum pump and sent to a RTO and scrubber system for control of hydrogen sulfide, ammonia, methane, benzene, and other trace gas emissions.

1.4 Construction Schedule

From the "Notice to Proceed" (NTP) from CE Obsidian management for the Amended Project, it is anticipated that Amended Project unit BR-1 will complete construction and go into operation in approximately 32 months (see Figure 2-14). Amended Project BR-2 and BR-3 will become operational in approximately 9-10 month intervals following completion of BR-1. From NTP, the full construction period for the three generation units is anticipated to be approximately 53 months. Construction of the production and injection wells will commence approximately seven months after NTP and will proceed concurrently with construction of BR-1, BR-2, and BR-3. The construction of wells and associated piping is expected to take approximately 24 to 30 months.

1.5 Overview of Changes to Environmental Impacts

This Amendment Petition has been prepared in accordance with current CEC power plant siting regulations and addresses each of 17 specified environmental topical areas. The following paragraphs briefly summarize, in alphabetical order, the environmental discussions in Section 5.0, focusing on the differences between the Amended Project and the original SSU6 project.

1.5.1 Air Quality

As was the case for the original SSU6 project, the Amended Project's air quality impacts would be less than significant with the implementation of mitigation measures contained in the CEC's existing Conditions of Certification, as adopted and modified to make them appropriate for the Amended Project. However, overall air quality impacts would be reduced compared to the original project. As discussed in the following paragraphs, compared to the original SSU6 project, the net result of the Amended Project's changes with respect to air emissions from normal operation will be: 1) H₂S emissions similar to the original project; 2) insignificant changes to combustion emissions; 3) minor reduction in PM₁₀ emissions; 4) significant reductions of VOC, benzene methane, and ammonia emissions; and 5) significant reductions in emissions associated with the activities such as transport of waste and regeneration of spent carbon. No significant changes are expected for construction phase emissions or impacts compared to the original project.

The original SSU6 project emissions were produced by multiple vent tanks, dilution water heaters, and handling and disposal of silica and sulfur filter cake. The Amended Project will not require dilution water heaters or the handling or disposal of significant amounts of filter cake. This is because the Amended Project's single flash technology maintains the heat energy of the brine at a sufficiently high level such that the silica stays in solution. Therefore, fugitive emissions associated with filter cake management will no longer occur. The inherent simplicity of single flash technology compared to multiple flash technology eliminates the need for equipment such as crystallizers and clarifiers which, in turn, greatly reduces the number of tank vents and other fugitive sources.

The original Project proposed LO-CAT plus Sulfurite technology to control Hydrogen Sulfide (H₂S) in NCG. The LO-CAT plus Sulfurite system would have generated three tons per day of sulfur that would have required offsite disposal. LO-CAT Sulfurite would not have controlled VOCs, benzene (a hazardous air pollutant), or methane (a potent greenhouse gas). The Applicant proposed an activated carbon adsorption system to augment the LO-CAT/Sulfurite system, which would have controlled benzene and ROC

emissions. Regeneration and/or replacement of the activated carbon would have resulted in air emissions from indirect sources associated with the regeneration process and transportation of waste offsite.

The Amended Project will use a recuperative thermal oxidizer (RTO) to control H₂S and other constituents of the NCG instead of the LO-CAT plus Sulfurite plus air treatment plus activated carbon technology. The RTO uses an efficient combustion technology to oxidize both the H₂S as well as the other VOCs in the NCG stream. This will control benzene, methane, and other volatiles. The H₂S forms sulfur dioxide (SO₂) gas, which is controlled in a wet scrubber downstream of the RTO. The SO₂ gas is neutralized chemically to form water soluble salts, which become dissolved in the scrubber water. In periods where the plants will produce excess condensate for the power generation process, this water will be injected into the geothermal brine source, helping to preserve the resource.

The original SSU6 project also proposed a biological oxidation process operated in one cell of the cooling tower to control H₂S emissions in the condensate makeup water. In contrast, the Amended Project will install a chemical oxidation process (referred to as "ChemOx") with a substantially higher control efficiency and operational reliability to control H₂S emissions. The RTO/ChemOx system substantially reduces H₂S emissions and associated ambient air quality impacts compared to the original project. Under normal operations, the Amended Project will not cause an exceedance of the 42 microgram per cubic meter ambient standard for H₂S as established by the California Clean Air Act.

The Applicant is predicting a 70 percent reduction in ammonia emissions from the Amended Project compared to the original project. The reduction in emissions is attributed to the caustic scrubber following the RTO; ammonia in the NCG will be absorbed in the caustic scrubbing solution and will be injected into the formation with the scrubber blowdown. The Amended Project will install Tier 4 diesel-fired engines to drive the emergency fire water pump and emergency generators. Tier 4 engines have substantially lower emission rates of criteria pollutants than the Tier 2 engines proposed for the original project.

Modeling for the original SSU6 project indicated significant unavoidable impacts to ambient air quality during Project construction. The Amended Project will have similar significant, unavoidable impacts, as the construction activities required for the Amended Project are similar to the original project. As was the case with the original project, plant commissioning H₂S emissions for the Amended Project have the potential to cause an exceedance of the California Ambient Air Quality Standards. Modeling of normal operating emissions for the Amended Project do not show exceedances of ambient air quality standards for criteria pollutants; no significant adverse impact would occur.

1.5.2 Biological Resources

Two federally listed wildlife species were identified as potentially impacted by the original SSU6 project—the Yuma clapper rail and the California brown pelican. The construction of production well pad OB-3 and an associated pipeline would have directly impacted Yuma clapper rail habitat. The OB-3 pipeline and the McKendry Road widening (to serve OB-3) would have impacted 0.4 acre of wetlands. Also, a production well pad would have been constructed and located in close proximity to the Wildlife Refuge. These impacts will no longer occur with the Amended Project because all production wells have been relocated to the plant site and, as a result, McKendry Road will not be widened. Brown Pelican are known to use the islands west of Obsidian Butte in the summer (approximately 0.7 mile from the plant site). The relocation of the production wells to the plant site has increased the distance of Project facilities from the islands and thus reduced the potential for impacts to the California brown pelican compared to the original project.

Biological surveys for the Project site, including the new injection well pads and pipeline alignments, were conducted in the fall of 2008. The surveys associated with the injection infrastructure and borrow site disclosed that there was no potential habitat for State or federally listed species, including the Yuma clapper rail and the California brown pelican. However, the new injection well pads and pipeline alignments will be located in areas with scattered western burrowing owl (BUOW) occurrences. The BUOW is listed as a species of special concern in the State of California as well as by the Federal government. Current land uses at the new injection well pads and pipelines are roadways and agricultural fields. Phase I and Phase II BUOW surveys were conducted in fall 2008 in accordance with the California Burrowing Owl Consortium's approved survey protocol and several owls and burrows were observed. Phase III (nesting season) surveys will be conducted in spring 2009. It is anticipated that the BUOW impacts of the Amended Project will be no greater than the impacts of the original SSU6 project.

Thus, the Amended Project will result in reduced biological and wetlands impacts compared to the original Project. The primary changes from previous impact conclusions or mitigation requirements are no wetlands impacts, removal of facilities (production well pad and pipeline) from Obsidian Butte (which reduces the direct impact on Yuma clapper rail habitat and the potential for indirect impacts on the California brown pelican), and the modified layout of facilities on the plant site such that pile driving during construction will occur further from Yuma clapper rail habitat (reducing indirect impacts on the Yuma clapper rail). Impacts to the BUOW will be mitigated as in the original SSU6 project, but the mitigation will be adjusted to reflect any changes in the number of burrowing owls potentially affected by the Amended Project based on the latest surveys. Moreover, even though the SSU6 wetland impacts will no longer occur, CE Obsidian has committed to implement the mitigation agreed upon for the original project of creating new wetlands to compensate for the wetland acreage that would have been affected.

1.5.3 Cultural Resources

As the Project was originally proposed, a direct impact to the "Obsidian Butte Lithic Scatter" would occur as a result of the construction of a pipeline from production well pad OB-3 to the power plant. This impact will not occur with the Amended Project because the production wells have been relocated to the plant site. Surveys conducted in fall 2008 did not identify cultural resources at the new locations of the injection well pads and pipelines or at the new borrow site.

It was concluded that the original SSU6 project had the potential to adversely affect previously unknown cultural resources, as it is possible that previously undiscovered archaeological resources will be exposed during construction activities. However, cultural resources monitoring will ensure identification of previously unknown resources during construction. The Amended Project would not affect the impact conclusions or mitigation requirements for the original project.

1.5.4 Geologic Resources and Hazards

The Amended Project will result in no substantial changes to the affected environment and no significant changes in the geological hazards and resources impacts compared to the original SSU6 project. As originally proposed, seismic shaking, liquefaction, and seiches potential represented the main geologic hazards at the site. No geologic or mineral resources were known to exist in the area with the exception of Obsidian Butte. A geotechnical investigation of the Project plant site was conducted in 2008 to cover the entire 160 acres of the plant site (see Amendment Petition Appendix B). This investigation augments the original site investigation work from 2002 and will serve as the basis for design of major plant infrastructure.

The 2008 investigation has not disclosed previously unknown geological hazard issues. The Amended Project would not affect the original SSU6 project conclusions or mitigation requirements with respect to geologic resources and hazards.

1.5.5 Hazardous Materials Handling

For the original SSU6 Project, the types, quantities of hazardous materials, and proposed mitigation measures would result in no significant impacts. The proposed modifications to the Project will modify somewhat the list and quantities of chemicals that will be used and stored on site compared to the original project. However, Amended Project hazardous materials impacts would be less than significant.

1.5.6 Land Use

A comparison of the land disturbance between the original SSU6 project and the Amended Project is summarized in Table 1-2. As shown, the Amended Project will permanently disturb approximately the same acreage. Therefore, any mitigation measures required would essentially mirror those of the original SSU6 project. The Amended Project will impact approximately the same number of agricultural lands as the original project (181 acres versus 167 acres [excluding 4.4 acres impacted by transmission lines]). However, due to the relocation of project components, the Amended Project will impact fewer acres of prime farmland (81 acres versus 95 acres [excluding two acres impacted by transmission lines]). As was the case for the original SSU6 project, the Amended Project is consistent with County zoning and land use planning requirements, and impacts would be less than significant.

Table 1-2 Land Disturbance

Project Component	Disturbance Area (Acres)			
	SSU6 Original		SSU6 Amended	
	Temp	Perm	Temp	Perm
Energy Facility	80.0	80.0	160.0	160.0
Substation ¹	11.0	11.0	N/A	N/A
Production Well Pads ¹	26.2	26.2	N/A	N/A
Injection Well Pads	15.4	15.4	14.1	14.1
Production Pipeline ¹	13.3	13.3	N/A	N/A
Injection Pipeline	40.0	40.0	39.3	39.3
Construction Laydown ¹	20.0	0.0	N/A	N/A
Construction Parking ¹	4.4	0.0	N/A	N/A
Borrow Site ¹	0.0	0.0	34.0	0.0
Totals:	210.3	185.9	242.8²	213.4²
N/A = Not Applicable				
¹ Included in SSU6 Amended Energy Facility Footprint				
² Accounts for 4.6 acres of overlap between the OB-2 injection pipeline and the borrow site				

1.5.7 Noise

For the original SSU6 project, noise and vibration issues involved steam blows, pile driving near wildlife habitat areas during mating and nesting seasons, and other noise emitting construction activities (heavy equipment). With the implementation of mitigation measures, these temporary (during construction) effects would be reduced to less than significant. There is only one residence potentially affected, as with the original project (the ranger residence at the Wildlife Refuge), which is approximately 4,000 feet from the site boundary. There is the potential for indirect noise and vibration related impacts on a special-status bird species (Yuma clapper rail) during plant site construction activities because there is Yuma clapper rail habitat adjacent to the northwestern corner of the plant site. Amended Project noise impact conclusions (less-than-significant) and mitigation requirements would be unchanged from the original project.

1.5.8 Paleontological Resources

There were no known paleontological resources at the original SSU6 project site, but underlying geologic formations have a “high” paleontological sensitivity rating. Based on an updated museum record search and a site survey conducted in 2008, the relocated injection well pads, associated pipelines, and borrow site will result in similar potential impacts as the original Project (no known fossils affected). The Amended Project site will have the same paleontologically sensitive underlying geologic formations, and thus the same potential to contain significant fossil resources. The proposed modifications to the Project will not affect previous impact conclusions or mitigation requirements; no significant impacts to paleontological resources would occur.

1.5.9 Public Health

A multipathway Health Risk Assessment for the original Project led to the conclusion that the incremental impact of the additional risk posed by the Project would not be significant. As discussed previously (see Air Quality), due to the substitution for the LO-CAT/Sulfurite/Carbon Adsorption system by an RTO in the Amended Project, emissions of benzene and ammonia, both toxic air contaminants, will be reduced substantially. The original project proposed a biological oxidation process to control H₂S emissions in the condensate makeup water. The Amended Project plans to install a chemical oxidation process (referred to as “ChemOx”) with a substantially higher control efficiency to control H₂S emissions, reducing H₂S emissions and associated public health risks. In contrast to the large amounts of filter cake that might have contained metals such as arsenic (a listed Toxic Air Contaminant [TAC]) produced by the multiple flash technology of the original project, the Amended Project will not require the handling or disposal of large amounts of filter cake, because of the use of single flash technology. Thus, the potential for fugitive H₂S emissions associated with filter cake management will no longer occur.

Health risk assessments consider cancer risk, acute health effects, and chronic health effects. The Imperial County APCD’s cancer significance criteria are 10 in one million (10 excess cancer cases in an exposed population of one million), while a hazard index rating of 1.0 is the threshold of significance for both acute and chronic health effects. The HRA showed that maximum health risk impacts from the Amended Project would be well below these thresholds of significance. Thus, the predicted health risks from Project emissions would be both less than the original SSU6 project and would be less than significant.

1.5.10 Socioeconomics

The original SSU6 project would not result in significant adverse socioeconomic impacts. Although construction will occur during a different time period and with a different schedule, modifications to the Project will not affect those conclusions. The Amended Project will contribute to Imperial County's economic base by providing increased employment and additional revenue sources from commercial geothermal development. Because of its larger construction workforce and higher capital cost, the Amended Project would have somewhat greater positive economic impacts during construction than the original project. Socioeconomic impacts during Amended Project operation would be similar to the original project.

1.5.11 Traffic and Transportation

The original SSU6 project would not have resulted in significant impacts on vehicular traffic (or other transportation modes such as rail). With the Amended Project, plant construction is expected to occur over a longer period of time and the peak construction work force and resulting traffic volumes will be higher than the original project. However, affected roadways will still operate at acceptable Levels of Service at peak Project construction. Project operations phase traffic volumes will not change substantially. The Amended Project would not change previous impact conclusions or mitigation requirements; impacts would be less than significant

1.5.12 Soils

As was the case for the original SSU6 project, impacts of the Amended Project to soil resources would be less than significant. The affected environment for the Amended Project has remained the same - the majority of the site is in irrigated agricultural use. Site soils have a moderate-to-high hazard for water erosion and moderate hazard for wind erosion. The site will be surrounded by an earthen berm with a top elevation of minus 220 feet to meet Imperial County flood control requirements and will have a detention basin on site to manage storm water runoff. The Amended Project will require moderately greater quantities of cut and fill than the original project.

1.5.13 Transmission System Safety and Nuisance

The transmission lines associated with the original SSU6 project have already been licensed by the CEC. The Amended Project proposes no changes to the transmission lines. Impacts would be as described for the original proposed project and the Amendment Petition does not provide additional discussion.

1.5.14 Visual Resources

As with the original project, the Amended Project facilities will be constructed in an area where the visual environment has already been modified substantially by the presence of nine existing geothermal facilities within two miles of the plant site. The Amended Project will add one more geothermal facility in a visual context where similar facilities already exist. The Project facilities themselves will be visually similar to those of the original SSU6. Visible plumes will be somewhat less than the original SSU6 project or the other existing plants. The Amended Project will have three smaller visible plumes from cooling towers rather than one larger plume. Although all of the facilities will occasionally emit visible plumes from their cooling towers,

a source of larger plumes (atmospheric flash tanks reducing pressure of brine flows to clarifiers) that is associated with some of the existing geothermal plants will not occur; the initially proposed 185 MW plant would have had such plumes, but the amended 215 MW plant would not. This is because of differences in geothermal technology used by the Amended Project compared to some of the existing plants and the initial 185 MW proposal. The Amended Project would not affect previous impact conclusions or mitigation requirements.

1.5.15 Waste Management

For the original Project, non-hazardous drilling wastes, sulfur byproducts, and filter cake would have been disposed of in a Class II monofill facility. It was concluded that the additional quantities of non-hazardous and hazardous waste generated during construction and operation would not result in significant impacts on waste management facilities. Geothermal drilling wastes are statutorily exempt from hazardous waste regulation under California Health and Safety Code (HSC) Section 25143.1. Although the Amended Project is expected to generate substantially less solids than the original project during operation, a small amount of solids are expected precipitate out of the brine in the brine ponds due to the low temperature (relative to reservoir temperatures) and the fact that some steam will flash off the produced brine, thus concentrating the dissolved salts. The rate of accumulation is not known, but is expected to be only a few tons per year. The brine pond solids will be removed annually, then dewatered in a filter press and transported by a licensed transporter to an appropriately permitted offsite facility. The Amended Project would result in reduced impacts compared to the original project and would not change previous impact conclusions (less than significant) or mitigation requirements.

1.5.16 Water Resources

Over 95 percent of the water required by the operating facilities associated with the Amended Project will be created from steam condensed from geothermal brine. The Amended Project will not require dilution water for brine processing. The emission control system will utilize a small amount of make-up water for a wet scrubber for air emissions control. Under expected conditions, water use for the Amended Project configuration will be somewhat higher (483 afy) than for the original SSU6 project (290 afy). Under conservative conditions, the three generation facilities in the Amended Project will use a total of approximately 953 afy, which is slightly less than the original SSU6 project conservative scenario of 987 afy. Under likely conditions, Project will use approximately 161 afy for each of the three units, for a total of 483 afy.

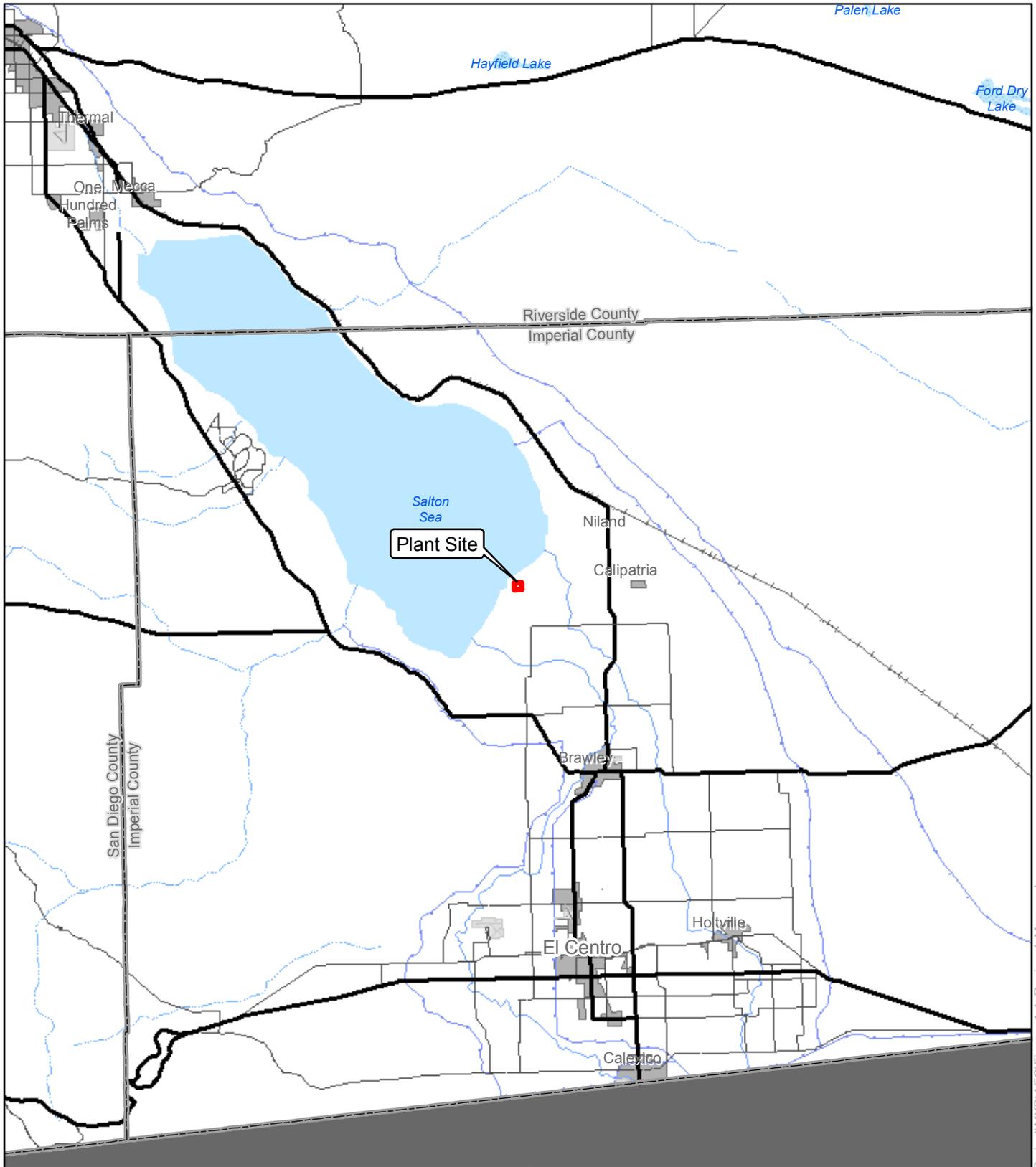
According to the CEC Final Decision for the original SSU6 project, the project would have removed approximately 173 acres out of agricultural production, thus avoiding agricultural water use of approximately 759 afy. The Amended Project will remove approximately 181 acres from production. If the same historical CEC water-use factor (approximately 4.3 afy/acre) is applied, the reduced agricultural water use would be expected to be approximately 779 afy. Thus, the Amended Project actually will result in water savings of approximately 296 afy under typical conditions. Under conservative conditions, the Project will use approximately 174 afy over pre-Project levels. Because these estimates are conservative and unlikely, Project's actual water use likely will be lower, and impacts to water supply would be less than significant.

The Project will be surrounded by a flood control berm and will have an onsite detention basin for site storm water management. Thus, there would be no storm water discharges from the site. Onsite brine ponds and mud sumps will be designed, constructed, operated, and maintained to meet Waste Discharge

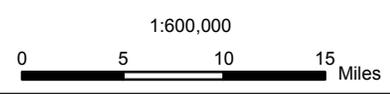
Requirements (WDR) of the Colorado River Basin Regional Water Quality Control Board (RWQCB), thereby protecting groundwater resources. As was the case for the original project, Amended Project water quality impacts would be less than significant.

1.5.17 Worker Safety

CEOE committed to preparing a Safety and Health Program to minimize worker hazards during construction and operation of the original SSU6 Project. The program will be based on the well established health and safety program and procedures used at the existing geothermal plants in the area. The contents of this program will not change as a result of the modified Project. Amended Project worker safety impacts would be less than significant.



**Amended SSU6 Project
Figure 1-1
Regional Map**

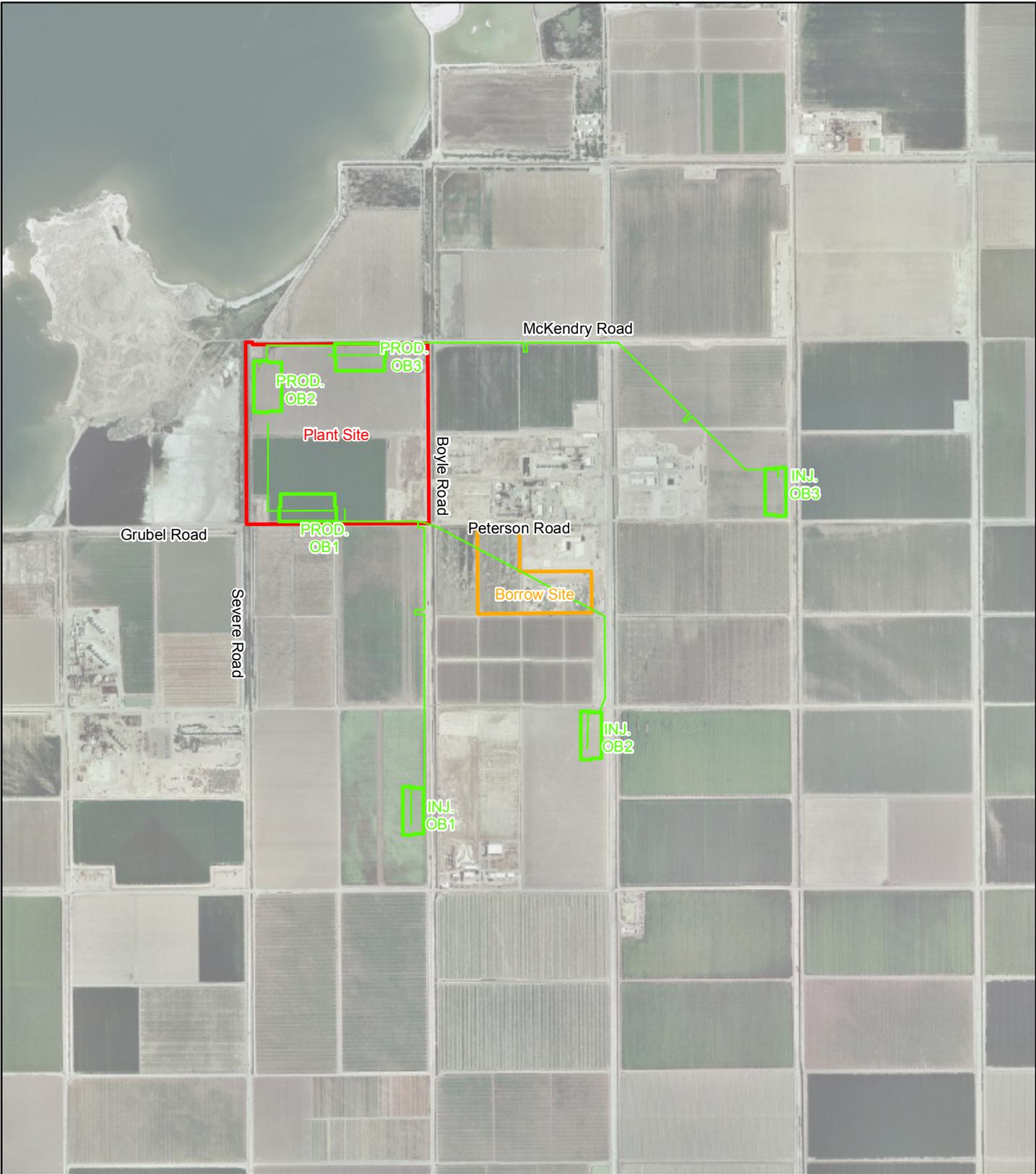


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A MIDAMERICAN ENERGY HOLDINGS COMPANY AFFILIATE

AECOM

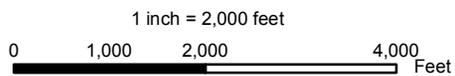
Project: 12676-001
Date: February 2009

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Legend

- Proposed Pipeline
- Proposed Well Pad
- Borrow Site
- Plant Site

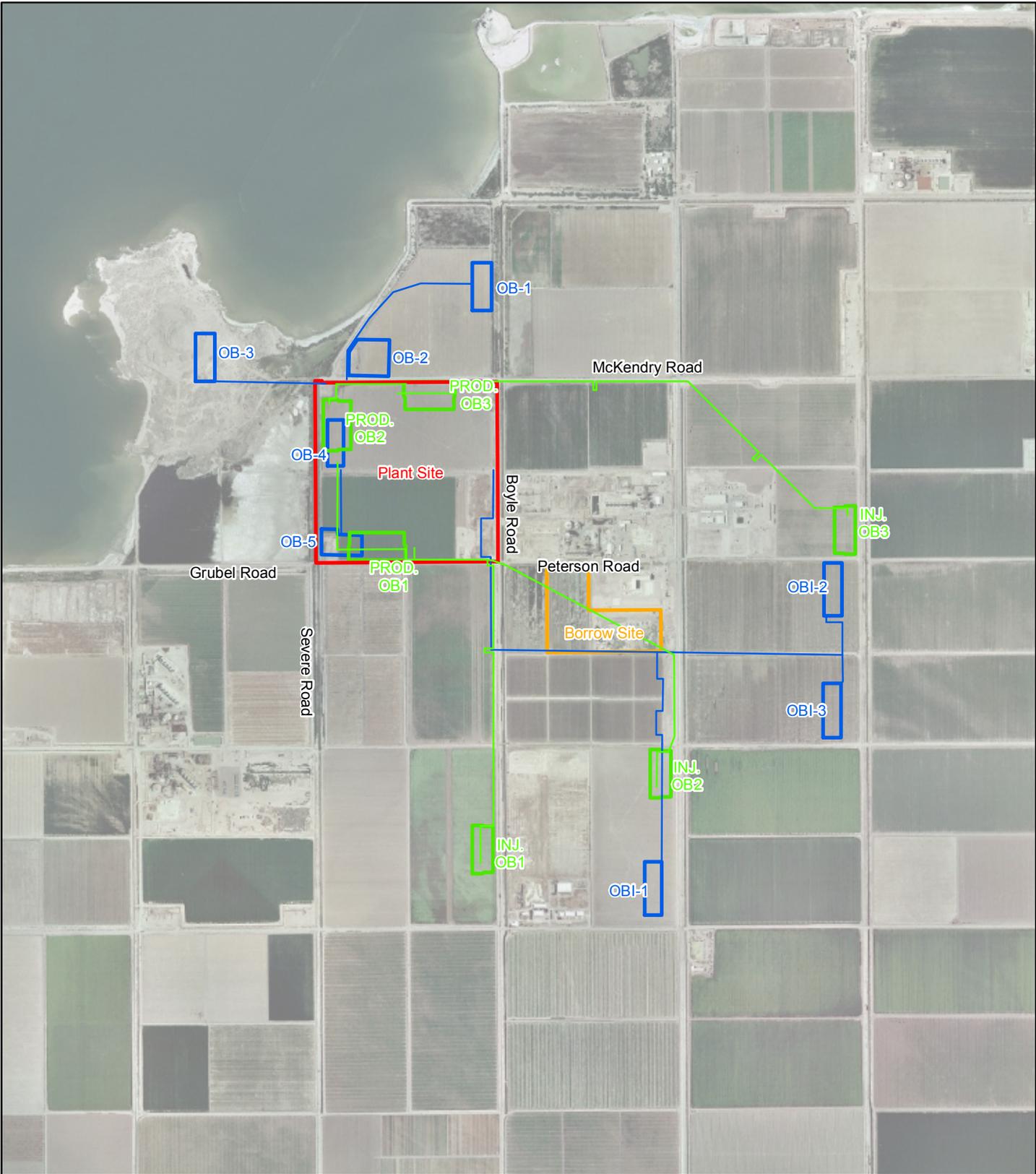


**Amended SSU6 Project
Figure 1-2
Plant Site and
Surrounding Areas**



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Legend

- Plant Site
- Original Well Pad Configuration
- Amended Well Pad Configuration
- Borrow Site
- Original Pipeline Configuration
- Amended Pipeline Configuration



1 inch = 2,000 feet

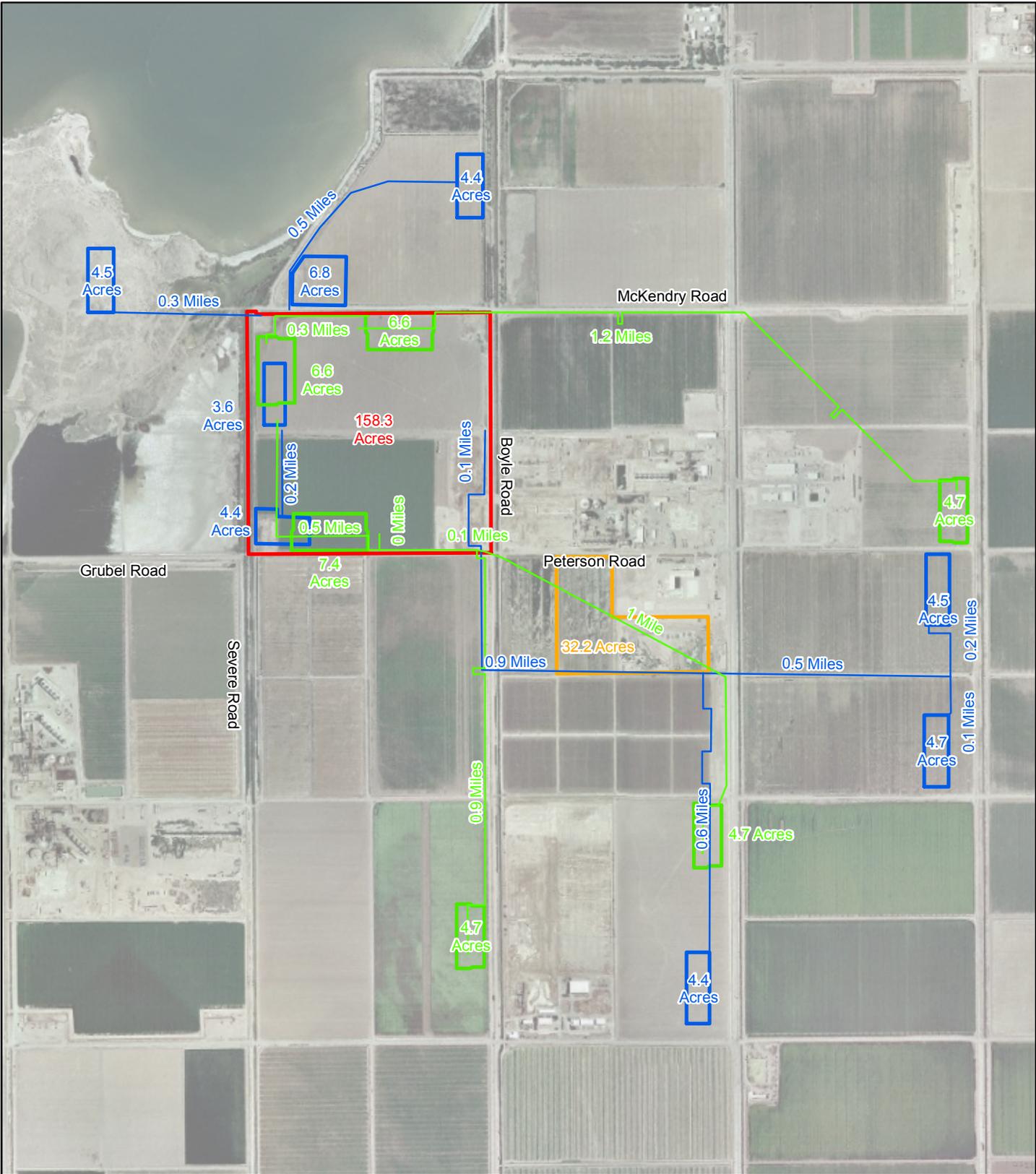


Amended SSU6 Project

**Figure 1-3
Original and Amended
SSU6 Project
Facilities Configuration**

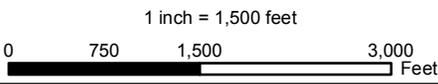


Project: 12676-001
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Legend

- Plant Site
- Original Well Pad Configuration
- Amended Well Pad Configuration
- Borrow Site
- Original Pipeline Configuration
- Amended Pipeline Configuration



Amended SSU6 Project

**Figure 1-4
Area and Length
Comparison of the
Amended and Original
Proposed Project**



Project: 12676-001
Date: February 2009