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February 11, 2008
357891

DOCKET
07-AFC-5
DATE FEB 11 2008
RECD. FEB 11 2008

Mr. Jack Caswell
California Energy Commission
Systems Assessment and Facilities Siting Division
1516 9th Street, MS 15
Sacramento, CA 95814-5504

RE: Data Response, Set 1B
Ivanpah Solar Electric Generating System (07-AFC-5)

Dear Mr. Caswell:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, Solar Partners IV, LLC, and Solar Partners VIII, LLC, please find attached one original and 12 hard copies of Data Response, Set 1B, which provide supplemental responses to Staff's data requests dated December 12, 2007.

Included in this submittal are the following oversize documents. The number of copies provided is shown in parenthesis. Please let us know if you need more hard copies. Electronic copies of these documents will be provided to the parties upon request.

- Attachment DR19-1, Delineation of Waters of the United States for the Ivanpah Solar Energy Project (13 copies)
- Attachment DR57-1, Preliminary Draft Drainage, Erosion, and Sediment Control Plan (7 copies)
- Attachment DR93-1B, Final Interconnection System Impact Study for DPT 1 (i.e., Ivanpah 2) (5 copies)

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier

John L. Carrier, J.D.
Program Manager

Enclosure
c: POS List
Project File

*Attachment DR19-1*
*Draft*

# Delineation of Waters of the United States for the Ivanpah Solar Energy Project: Eastern San Bernardino County, California

Prepared for

**Solar Partners I, LLC**
**Solar Partners II, LLC**
**Solar Partners IV, LLC**
**Solar Partners VIII, LLC**

February 2008

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2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833-2937

*Attachment DR19-1*
*Draft*

# Delineation of Waters of the United States for the Ivanpah Solar Energy Project: Eastern San Bernardino County, California

Submitted to

**Solar Partners I, LLC**
**Solar Partners II, LLC**
**Solar Partners IV, LLC**
**Solar Partners VIII, LLC**

February 2008

CH2MHILL

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# Acronyms and Abbreviations

| | |
|---|---|
| ˚F | degree(s) Fahrenheit |
| CDFG | California Department of Fish and Game |
| ft | feet |
| GIS | geographic information system |
| kV | kilovolt |
| MW | megawatt |
| NRCS | Natural Resource Conservation Service |
| SEGS | Solar Electric Generating System |
| TNW | traditional navigable waters |
| U.S. | United States |
| USACE | United States Army Corps of Engineers |
| USGS | United States Geological Survey |
| YR | yellow-red Munsell® color designation |

SECTION 1

# Introduction

This report presents the findings of a Waters and Wetland Delineation for Bright Source Energy's proposed Ivanpah Solar Electric Generating System (Ivanpah SEGS). The proposed project includes two 100-MW phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). Each 100-MW site requires about 850 acres (or 1.3 square miles); the 200-MW site is about 1,660 acres (or about 2.6 square miles). The total area required for all three phases, including the Administration/Operations and Maintenance Building and substation, is approximately 3,400 acres.

The information provided in this report is intended to assist the U.S. Army Corps of Engineers (USACE) with a determination of the extent of jurisdictional waters of the U.S. within the project study area. In addition, this report may also provide information that may be of use to the California Department of Fish and Game (CDFG), and the State Water Quality Control Board in determining the extent of state jurisdiction in the project area.

## 1.1 Project Location

The proposed site is located in the Mojave Desert in eastern San Bernardino County, 4.5 miles southwest of Primm, Nevada, 3.1 miles southwest of the California-Nevada border (Figure 1-1). The site is located in Township 17N, Range 14E, and Township 16N, Range 14E, on land administered by the Bureau of Land Management. The center of the project is located between Sections 33 and 34 of Township 17N, Range 14E. Figure 1-2 shows the proposed project within the corresponding Township, Range, and Sections.

The site can be accessed from the Yates Well Road Exit off Highway 15 (I-15), continuing along Colosseum Road for approximately 2 miles, past the Southern California Edison 115-kilovolt (kV) transmission corridor line that bisects the southeastern part of Ivanpah 2. As the total area required for all three phases is approximately 3,400 acres, the majority of the site is accessible via pedestrian surveys.

## 1.2 Environmental Setting

The project area is located within the Ivanpah Valley, an elongated north-south trending topographic basin that crosses the California-Nevada border. The project area is northwest of I-15, which runs through the northern part of the Ivanpah Valley. In the valley bottom are Ivanpah Dry Lake, in California, and Roach Lake to the north, in Nevada. These dry lakes are at an elevation of about 2,400 feet. Several mountain ranges surround the Ivanpah Valley. The Spring Mountains lie to the northwest, mainly in Nevada. To the northwest in California, north of I-15, is the Clark Mountain Range, including Clark Mountain, which, at 7,929 feet in elevation, is the highest peak of those surrounding the Ivanpah Valley. To the southwest, south of I-15, are the Mescal Range and the Ivanpah Mountains. To the northeast, east of I-15 in Nevada, are Sheep Mountain and the Lucy Gray Mountains. The

Mid Hills lie to the southeast in California, south of I-15. In California, much of the area surrounding the Ivanpah Valley, especially south of I-15, is included in the East Mojave National Scenic Area.

The project area is located within the Mojave Desert, and its biogeography and climate are typical of that region. In terms of surface water hydrology, the Ivanpah Valley has no surface outlet to the ocean, therefore, hydrologically, it is a part of the southwestern hydrographic Great Basin. The project area is located on an alluvial fan, or bajada, that extends eastward from the base of the Clark Mountain Range toward Ivanpah Dry Lake. The alluvial fan topography slopes very gradually (3 to 5 percent) to the east and southeast from a high elevation of about 3,150 feet in the northwest corner to about 2,850 feet in the southeast corner. The alluvial fan is dissected by many ephemeral wash drainage features. Most are small (active channels 1 to 3 feet wide), but some are much larger, with bank-to-bank widths of more than 50 feet and active channels 5 to 15 or more feet wide.

Two distinct small hills arise within the alluvial fan. To the east is a hill composed mainly of reddish metamorphic rocks that, in this report, will be referred to as Metamorphic Hill. To the west is a much smaller gray limestone hill. To the north are the northeastern foothills of the Clark Mountain Range, composed mainly of limestone. The following sections summarize the vegetation, climate, hydrology, and soils of the project area.

### 1.2.1 Vegetation

Mojave Creosote Bush Scrub is the predominant vegetation type within the project area. Mojave Yucca–Nevada Ephedra Scrub is located at the northern boundary of the 1-mile buffer and very small inclusions of Mojave Wash Scrub were observed (not mapped) within the project boundaries (Figure 1-3). Mojave Creosote Bush Scrub corresponds to the Holland type of the same name (Holland 1986) and may correspond to one or more of the Creosote Bush, Creosote Bush-White Bursage, or Black Bush series of *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). Mojave Creosote Bush Scrub is composed of widely spaced evergreen and drought-deciduous shrubs, cacti, and yucca, from 1 to 9 feet in height. Creosote bush (*Larrea tridentata*) is the dominant species with Burrobush (*Ambrosia dumosa*), cheesebush (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevadensis*), and Mojave yucca (*Yucca schidigera*) common associates throughout the project site. Several species of cacti including California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*), clustered barrel cactus (*Echinocactus polycephalus* var. *polycephalus*), Engelmann's hedgehog cactus (*Echinocereus engelmannii*), silver cholla (*Opuntia echinocarpa*), buckhorn cholla (*Opuntia acanthocarpa* var. *coloradensis*), pencil cactus (*Opuntia ramosissima*), and beavertail cactus (*Opuntia basilaris* var. *basilaris*) are also common in parts of this community.

Mojave Yucca–Nevada Ephedra Scrub is restricted to a small area of limestone-dominated pavement plain on the northern edge of the 1-mile buffer area (see Figure 1-3). This vegetation type may correspond to the Mojave Yucca Scrub and Steppe type, which is named but not described by Holland (1986). It also may correspond to the Mojave Yucca series of Sawyer and Keeler-Wolf (1995). The dominant plants are Mojave yucca and Nevada ephedra, which form a moderately dense plant cover from 3 to 6 feet in height. Creosote bush and burrobush are almost entirely lacking. Spiny menodora and Engelmann's hedgehog cactus are also relatively common.

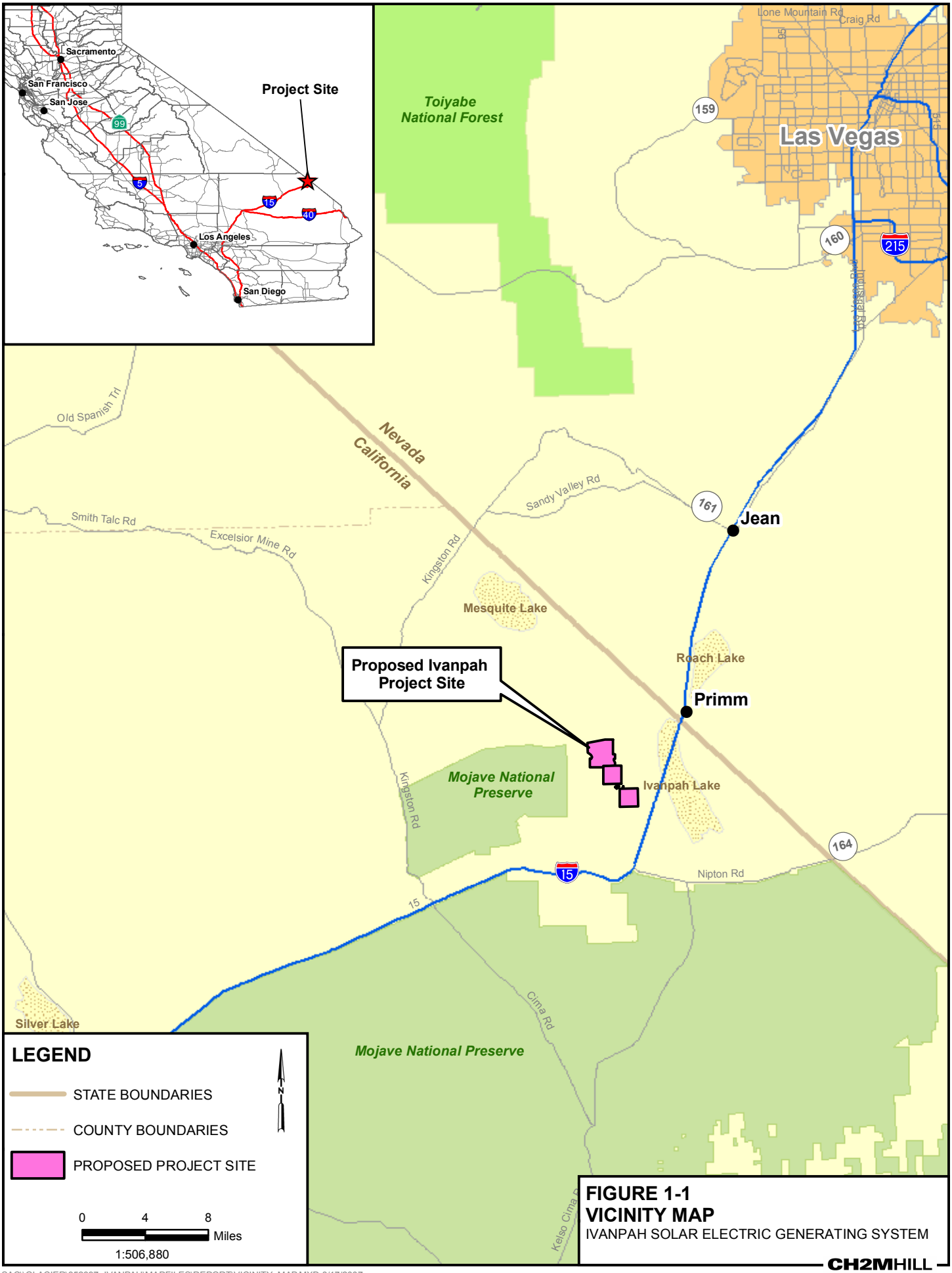


**FIGURE 1-1**
**VICINITY MAP**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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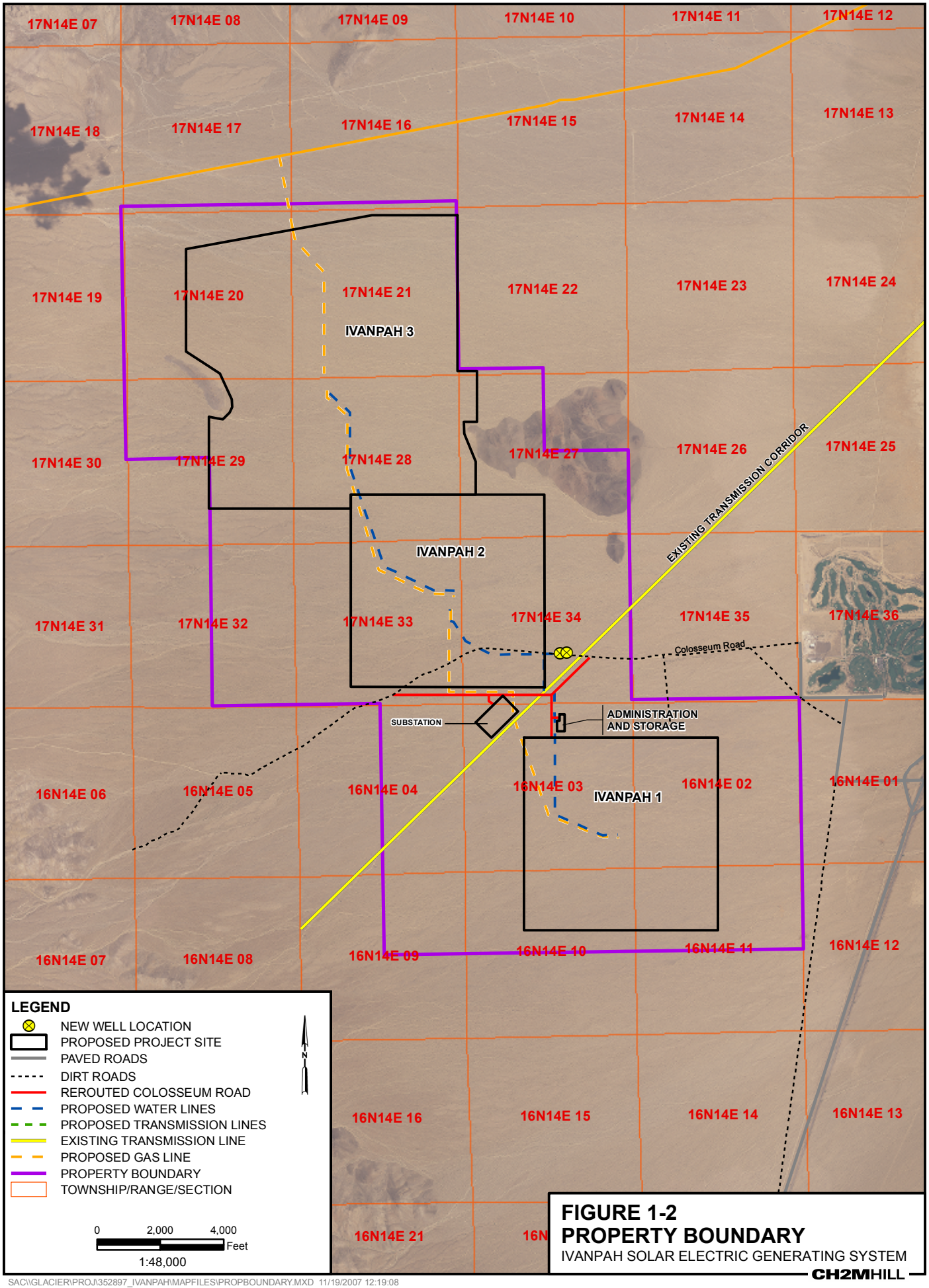


**FIGURE 1-2**
**PROPERTY BOUNDARY**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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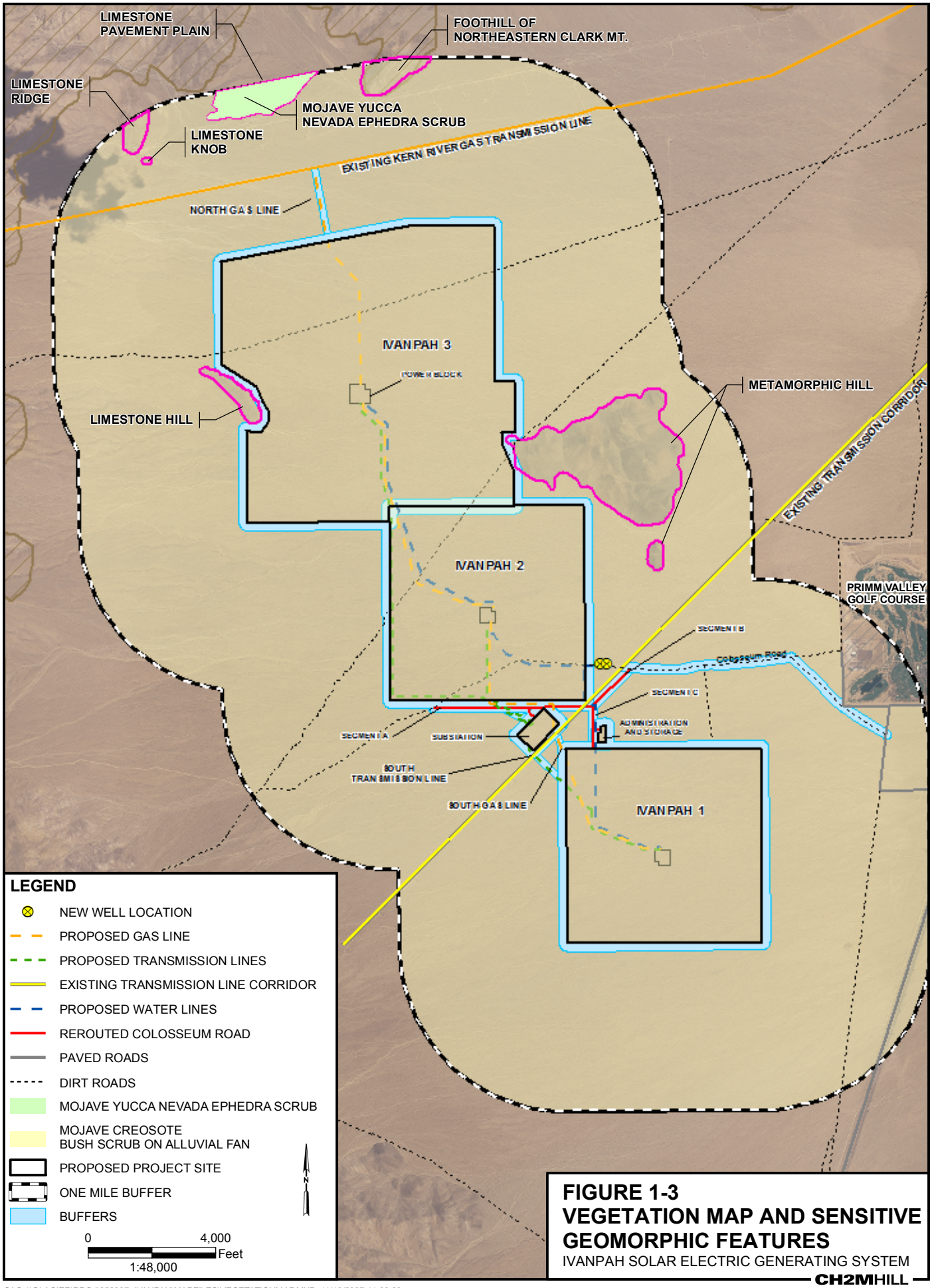


**FIGURE 1-3**
**VEGETATION MAP AND SENSITIVE GEOMORPHIC FEATURES**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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Mojave Wash Scrub is a shrub-dominated vegetation type found in larger washes, arroyos, and canyons throughout the Mojave Desert. This type corresponds to the Holland vegetation type of the same name (Holland 1986) and may correspond to the Catclaw Acacia series in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). The dominant shrubs are mainly drought-deciduous and range from 1 to 12 feet in height. Dominant species include: catclaw acacia (*Acacia greggii*), desert willow (*Chilopsis linearis*), cheesebush, pygmy-cedar (*Peucephyllum schottii*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), mesquite (*Prosopis* species), desert almond (*Prunus fasciculata*), bladder-sage (*Salazaria mexicana*), and blue sage. Perennial herbs are regular components of this vegetation type. Annual herbs may be present in high density and diversity during wet years and after localized flood events.

### 1.2.2 Climate and Hydrology

The Ivanpah Valley climate is hot and arid, with extreme fluctuations in daily temperatures. Average temperatures range from 70˚F in the winter to summer temperatures exceeding 100˚F. Strong, dry winds are characteristic of late winter and early spring, particularly in the late afternoon to early evening. In the rain shadow created by the Sierra Nevada Mountains, the Mohave Desert generally has low humidity and precipitation. May and June are the driest months, with seasonal thunderstorms from July to September, and the majority of the precipitation falling from October to April. The average annual rainfall is 4.5 inches, but the 2006 -2007 season was unusually dry with only 1.7 inches of precipitation (National Weather Service 2007).

The project area is located in the Ivanpah hydrologic unit of the South Lahontan Watershed, which includes approximately 278,486 acres in the Ivanpah and Pahrump Valleys of California and Nevada (CDFG-BIOS 2007). In this area, all drainage is internal with the rapid runoff from mountains and alluvial fans collecting in closed basins in the Ivanpah Valley. Streams, washes, and playas are dry most of the year, with surface water only present in response to storm events. Ivanpah Lake is located approximately 2 miles east and downslope of the project area. The extensive dry lake bed covers approximately 35 square miles and is located in California adjacent to the California/Nevada border. There are two mapped springs, Whisky Spring and Ivanpah Spring, located approximately 1.6 miles west of the proposed project site in the foothills of the Clark Mountains.

## 1.3 Soils

The *Soil Survey of the Mojave Desert Area, Northeast Part, California* (NRCS 2007a) includes five soil units mapped within the project site and 1-mile buffer (Figure 1-4). Arizo loamy sand, 2 to 8 percent slopes, comprises the majority of the project study areas with limited areas of Copperworld soils along the western edge of the Ivanpah 3 site. Other soil units in the vicinity included the Umberci rock outcrop association and Colosseum association mapped at the extreme northern edge of the 1-mile buffer, and Popups sandy loam in the southwestern part of the buffer. These soils types are briefly described in the following sections based on the official soil series descriptions from the NRCS (2007b). All soil colors are for moist soils unless otherwise stated.

#### 1.3.1.1 Arizo Loamy Sand, 2 to 8 Percent Slopes

The Arizo series are the most common and widespread mapped soil unit in the project study area. This very deep soil formed in mixed alluvium, and is found on recent alluvial fans, stream terraces, and floodplains of intermittent streams and channels. The uppermost horizon (0 to 8 inches), typically consists of dark grayish-brown (10YR 4/2) very gravelly fine sand. Below 8 inches the soils are a dark grayish-brown (10YR 4/2) extremely gravelly sand. Soil in the upper horizons are moderately alkaline (pH 8.2). This soil is excessively drained with negligible to medium runoff, and rapid to very rapid permeability.

#### 1.3.1.2 Copperworld Association, 30 to 60 Percent Slopes

The Copperworld series consists of very shallow or shallow to bedrock that formed in residuum and colluvium from metamorphic rocks. This soil occurs on the hills to the east and southwest of the project study area with slopes ranging from 30 to 60 percent. This soil is generally covered with 15 percent fine gravel, 55 percent medium and coarse gravel, 10 percent cobbles, 3 percent stones, and 3 percent boulders. The surface layer is typically a dark yellowish-brown (10YR 3/4) to dark brown (10YR 3/3) gravelly sandy loam with pH ranging from 7.2 to 7.4. Indurated metamorphic bedrock is often present within the top 6 inches with root fractures greater than 2.5 inches apart. This soil is somewhat excessively drained with medium to high runoff and moderately rapid permeability above the bedrock.

#### 1.3.1.3 Popups Sandy Loam, 2 to 30 Percent Slopes

The Popups series formed in mixed alluvium and consists of moderately deep soils over a duripan. Slopes generally range from 2 to 30 percent. The upper 2 inches of the soil is typically a dark brown (10YR 3/3), very gravelly sandy loam. From 2 to 12 inches, the soil is a dark yellowish-brown (10YR 5/3) gravelly sandy loam. Surface soils are slightly alkaline (pH 7.6). Below 12 inches, the soil is a moderately alkaline (pH 8.0), brown (7.5YR 4/4) gravelly sandy loam. A weakly cemented duripan is present at a depth of approximately 33 inches. Popups soils are well drained with low to medium runoff.

#### 1.3.1.4 Umberci-Rock Outcrop Association, 30 to 75 Percent Slopes

The Umberci soils formed in residuum and colluvium from limestone and dolomite and are very shallow to bedrock. These soils and are found on mountains and hills with slopes ranging from 30 to 75 percent. Typically there is a moderately alkaline (pH 8.2) shallow surface horizon (5 inches) that is a yellowish brown (10YR 4/4) gravelly sandy loam to very gravelly fine sandy loam. The surface is covered by 74 percent gravel, 15 percent cobbles, 5 percent stones, and 1 percent boulders. Umberci soils are well drained with very high runoff.

#### 1.3.1.5 Colosseum Association, 2 to 15 percent slopes

The Colosseum series includes very deep soils that formed in alluvium derived from limestone and dolomite. These soils are on fan aprons and drainageways with slopes ranging from 2 to 15 percent. The shallow surface horizon (4 inches) is a moderately alkaline (pH 8.2), brown (10YR 5/3) fine sandy loam to gravelly loamy sand that is covered by 80 percent gravel and 5 percent cobbles. Below 4 inches, the soil is a moderately alkaline (pH 8.4), brown (10YR 5/3) extremely gravelly loamy sand. Colosseum soils are somewhat excessively drained with negligible to very low runoff and moderately rapid permeability.

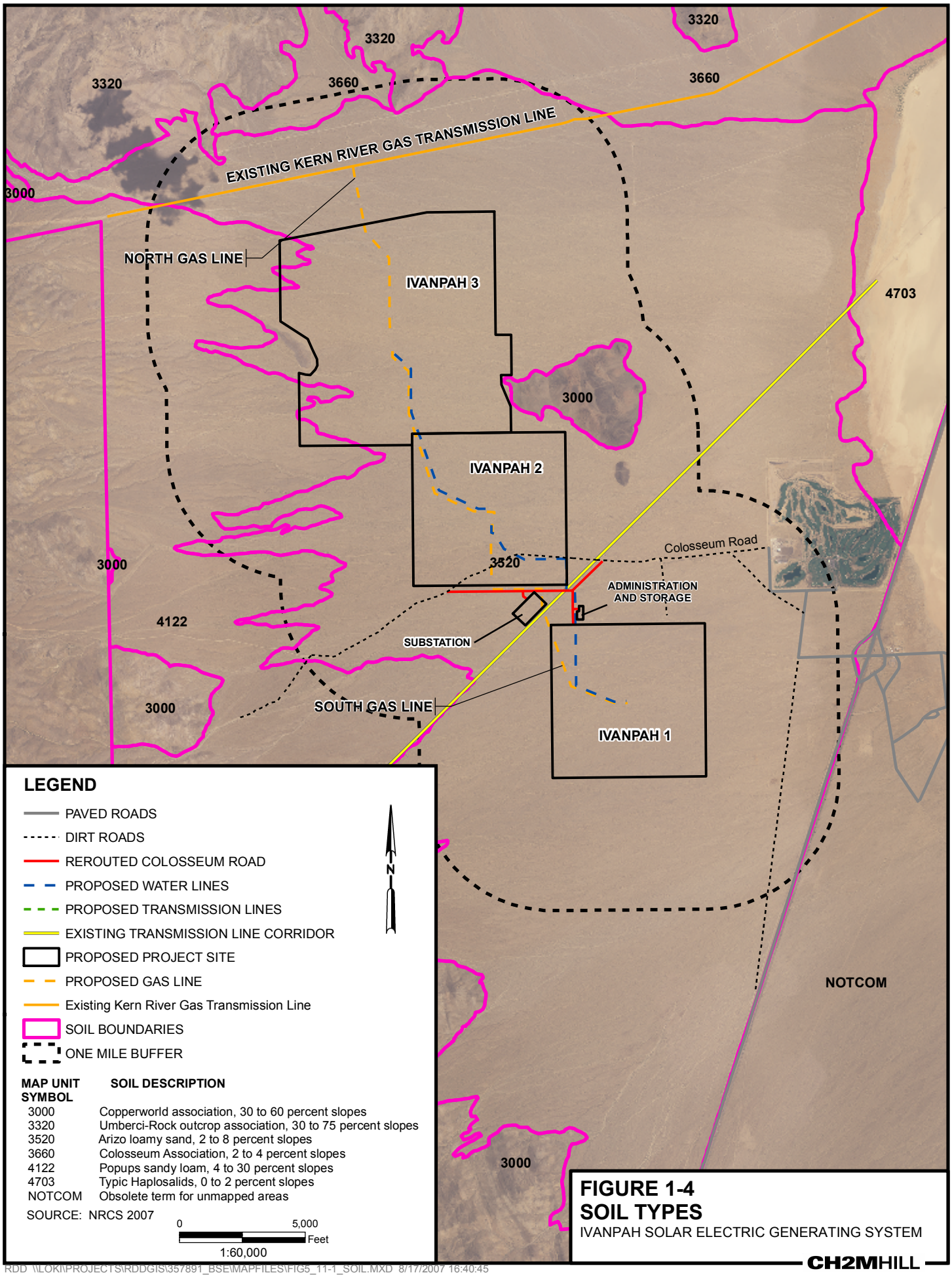


**FIGURE 1-4**
**SOIL TYPES**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

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### 1.3.2 Hydric Soils

The soil types on the site were not identified on the California State hydric soils list (NRCS 2007c).

SECTION 2

# Methods

Aerial photographs and the Ivanpah Lake United States Geological Survey (USGS) 7.5-Minute Quadrangle Map were used to identify potential wetland and water resources in the project area. A site reconnaissance survey and preliminary assessment of water features was conducted on March 29 and 30, 2007. The preliminary data review and site reconnaissance survey identified numerous west to east trending ephemeral washes throughout the project area. Given the size of the study area and the myriad of features present, the characterization and mapping of these drainages was accomplished by a combination of field surveys and mapping using high-resolution aerial photographs. Prior to field surveys, this proposed methodology was discussed with USACE regulatory staff from the Los Angeles District (Pers. Comm. Shannon Pankratz 2007).

The formal wetland delineation field surveys were conduced from April 16 through 20, and May 21 through 24, 2007. The total survey area delineated was approximately 4,272 acres, and included the proposed disturbance areas as well as a 1,000-foot buffer area for each of the three project sites, access roads, and linear utility corridors. Linear transects perpendicular to the ephemeral drainages (north-south orientation) were established approximately every 1,000 feet. Pedestrian surveys were then conducted along each transect and data were recorded at each point where an ephemeral wash intersected the transect line.

The location of each crossing was recorded using a Trimble® Geo-XT global positioning device and general characteristics of the wash, including average channel width, evidence of flow, and general vegetation were noted. Field data were then incorporated into a geographic information system (GIS). Data points collected along the transect lines were then plotted on recent aerial photographs, with 2-foot resolution, and the drainage features within the survey area were manually digitized using the field data as reference locations.

Based on the field data, each wash was then assigned a size category of 1, 2, or 3. Category 1 washes are relatively large ephemeral drainages over 10 feet wide. These features include single, large channels with well-defined bed and banks, as well as broad, but weakly expressed, assemblages of braided erosional channels that collectively cover an area of at least 10 feet of active flow area. Category 2 includes ephemeral washes between 4- and 10-feet wide. As with category 1 washes, these features range from well defined single channels to shallow erosional braided channels. Category 3 includes weakly expressed erosional/ flow channels that generally lack defined cut banks and are no more than 4 feet wide.

SECTION 3

# Results

## 3.1 Ephemeral Washes

The entire study area is dissected by numerous ephemeral washes ranging in size from small (1 to 4 feet wide), weakly expressed erosional features to broad (over 10 feet wide), drainages. The active flow channels are generally devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contained cobble and scattered larger rocks. Throughout the study area, the majority of the washes are associated with Mojave Creosote Bush Scrub habitat. Species such as cheesebush, are common in some medium- to large-sized washes; especially in braided channels that contain slightly elevated areas intermixed with the active flow channels. Mojave Wash Scrub is limited to the larger washes (typically over 15 feet) with sandy gravel substrate and well-defined banks. Vegetation associated with these features included catclaw (*Acacia greggii*), cheesebush, Mojave Desert California Buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), desert willow (*Chilopsis linearus*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), bladder-sage (*Salazaria mexicana*), desert almond (*Prunus fasciculate*), Virgin River encelia (*Encelia virginensis*), Anderson's boxthorn (*Lycium andersonii*), Cooper's boxthorn (*Lycium cooperi*), sand-wash groundsel (*Senecio flaccidus* var. *monoensis*), wire lettuce (*Stephanomeria pauciflora*), and blue sage (*Salvia dorrii*) (Table 3.1-1).

A total of 1,689 ephemeral washes were identified and mapped in the project study area, including 87 category 1 washes, 365 category 2 washes, and 1,237 category 3 washes (Table 3.1-2). Small- to medium-sized washes are common and widespread throughout the entire project area, while the larger washes are most abundant in the northern section of Ivanpah 3 as well as the eastern side of Ivanpah 2 (Figures 3-1 through 3-3; and Appendix A). The larger washes tend to dissipate into smaller, more braided channels as they progress downslope. The majority of the drainages terminate prior to reaching Ivanpah Dry Lake with defined erosion features diminishing and becoming broad surface flow only. All of the ephemeral washes identified in the study area typically flow only in response to storm events. Representative photographs of the drainage features are provided in Appendix B.

TABLE 3.1-1
Plant Species Associated with the Ephemeral Washes in the Study Area

| Scientific Name | Common Name | Wetland Indicator[a] | Distribution |
|---|---|---|---|
| *Acacia greggii* | catclaw | FACU | Sparse |
| *Ambrosia dumosa* | burrobush | NOL | Common |
| *Ambrosia eriocentra* | woolly bursage | NOL | Scattered |
| *Amsonia tomentosa* | woolly amsonia | NOL | Sparse |
| *Bebbia juncea* | sweetbush | NOL | Sparse |
| *Chamaesyce albomarginata* | rattlesnake weed | NOL | Sparse |
| *Chilopsis linearus* | desert willow | FACW* | Sparse |

TABLE 3.1-1
Plant Species Associated with the Ephemeral Washes in the Study Area

| Scientific Name | Common Name | Wetland Indicator[a] | Distribution |
|---|---|---|---|
| *Chrysothamnus paniculatus* | black-banded rabbitbrush | NOL | Common |
| *Encelia virginensis* | Virgin River encelia | NOL | Scattered |
| *Ephedra nevadensis* | Nevada ephedra | NOL | Common |
| *Eriogonum fasciculatum* | California buckwheat | NOL | Common |
| *Hymenoclea salsola* | cheesebush | NOL | Common |
| *Larrea tridentata* | creosote bush | NOL | Abundant |
| *Lepidium fremontii* | desert alyssum | NOL | Sparse |
| *Lycium andersonii* | Anderson box-thorn | NOL | Sparse |
| *Opuntia acanthocarpa* | buckhorn cholla | NOL | Common |
| *Opuntia ramosissima* | pencil cholla | NOL | Common |
| *Penstemon* (*palmeri* or *bicolor*) | Penstemon | NOL | Sparse |
| *Petalonyx thurberi* | Thurber sandpaper plant | NOL | Sparse |
| *Porophyllum gracile* | slender poreleaf | NOL | Sparse |
| *Prunus fascuculata* | desert almond | NOL | Sparse |
| *Salazaria mexicana* | Mexican bladder sage | NOL | Common |
| *Salvia dorrii* | blue sage | NOL | Sparse |
| *Senecio flaccidus* | sand-wash groundsel | NOL | Sparse |
| *Stephanomeria pauciflora* | wire-lettuce | NOL | Sparse |
| *Yucca schidigera* | Mojave yucca | NOL | Common |

[a] = National List of Plant Species that Occur in Wetlands, Region 0 [California] (Reed 1988).
FACW – = Facultative Wetland Status; Estimated probability of 67% to 99% chance of occurring in wetlands.
FACU – = Facultative Upland Status; Estimated probability of 1% to 33% chance of occurring in wetlands.
NOL – = Plant species is not included in the 1988 list and is considered to be an upland species = Not on 1988 List.
+, -, * = Indicates a tentative indicator status= Modifiers developed by the National Plant List Panel.

Abundant = plants are widespread along the channel and with relatively high cover where present
Common = plants are widespread along the channel with moderate to low cover; occasional locally high cover
Scattered = plants have a patchy distribution throughout along the channel, cover ranges from sparse to locally high
Sparse = plants observed in a few locations with generally sparse cover, not common throughout along the channel

TABLE 3.1-2
Summary of Ephemeral Washes Identified in the Project Study Area

| | Number of Washes | Total Length (feet) |
|---|---|---|
| **Type 1 Washes (≥ 10 feet wide)** | | |
| Ivanpah 1 | 7 | 6,195 |
| Ivanpah 2 | 27 | 28,859 |
| Ivanpah 3 | 41 | 58,228 |
| Natural Gas Pipeline Corridor* | 7 | 8,349 |
| Colosseum Road* | 2 | 858 |
| Substation | 0 | 0 |
| Facilities and Storage Building | 3 | 1,857 |
| **Total All Sites** | **87** | **104,346** |
| **Type 2 Washes (5 to 10 feet wide)** | | |
| Ivanpah 1 | 77 | 100,006 |
| Ivanpah 2 | 134 | 101,538 |
| Ivanpah 3 | 140 | 137,820 |
| Natural Gas Pipeline Corridor* | 4 | 3,332 |
| Colosseum Road* | 5 | 3,400 |
| Substation | 5 | 1,766 |
| Facilities and Storage Building | 0 | 0 |
| **Total All Sites** | **365** | **347,862** |
| **Type 3 Washes (1 to 4 feet wide)** | | |
| Ivanpah 1 | 398 | 248,750 |
| Ivanpah 2 | 342 | 233,012 |
| Ivanpah 3 | 395 | 368,551 |
| Natural Gas Pipeline Corridor* | 23 | 24,895 |
| Colosseum Road* | 25 | 8,975 |
| Substation | 44 | 18,013 |
| Facilities and Storage Building | 10 | 4,537 |
| **Total All Sites** | **1237** | **906,733** |

Note:

* Survey area included 1,000 foot buffer around these project features.

No wetlands were observed within the entire project area.

## 3.2 Summary of Potential Jurisdictional and Non-Jurisdictional Features Identified in the Analysis Area

Waters of the U.S. are defined as all navigable waters, including: (1) all tidal waters; (2) all interstate waters and wetlands; (3) all other waters such as lakes, rivers, streams (perennial or intermittent), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds; the use, degradation, or destruction of which could affect interstate commerce; (4) all impoundments of water mentioned above; (5) all tributaries to waters mentioned above; (6) territorial seas; and (7) all wetlands adjacent to waters mentioned above. Waste treatment systems, including treatment ponds, are not Waters of the U.S. (33 CFR Section 328.3). Based on the recent guidance issued from USACE Headquarters, jurisdictional waters of the U.S. include traditional navigable waters (TNWs), all wetlands adjacent to TNWs, non-navigable tributaries of TNWs that are relatively permanent (i.e., tributaries that typically flow year-round or have continuous flow at least seasonally), and wetlands that directly abut such tributaries (USACE 2007). Additionally, jurisdiction is asserted over water bodies that are not relatively permanent if that body is determined to have a significant nexus with a TNW (USACE 2007).

Under the recent guidance, desert swales defined as “shallow features in the landscape that may convey water across upland areas during and following storm events,” and erosional gullies are generally considered non-jurisdictional features because they are not tributaries nor do they have a significant nexus to a TNW (USACE 2007). Based on this guidance, the ephemeral washes identified in the project area may be considered non-jurisdictional under the Clean Water Act. However, the USACE is ultimately responsible for jurisdictional determinations and this report has been prepared to provide the necessary information to assist the USACE with that determination. In addition, the Washes identified in the project area may also be regulated under state laws and regulations administered by the Regional Water Quality Control Board and the California Department of Fish and Game.

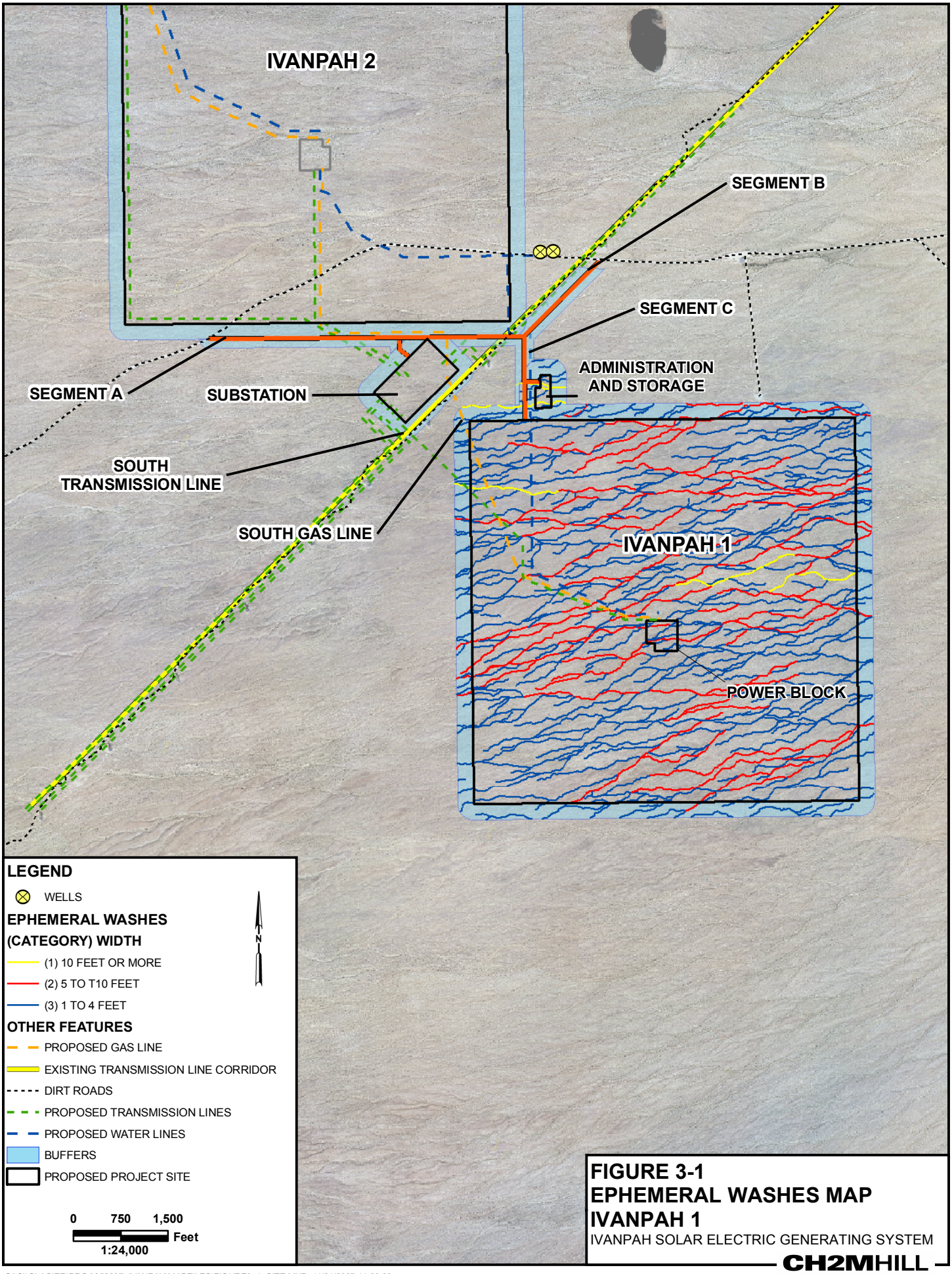


**FIGURE 3-1**
**EPHEMERAL WASHES MAP**
**IVANPAH 1**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

SAC\\GLACIER\PROJ\352897_IVANPAH\MAPFILES\FIGURE3_1_SITE.MXD 11/21/2007 14:23:33

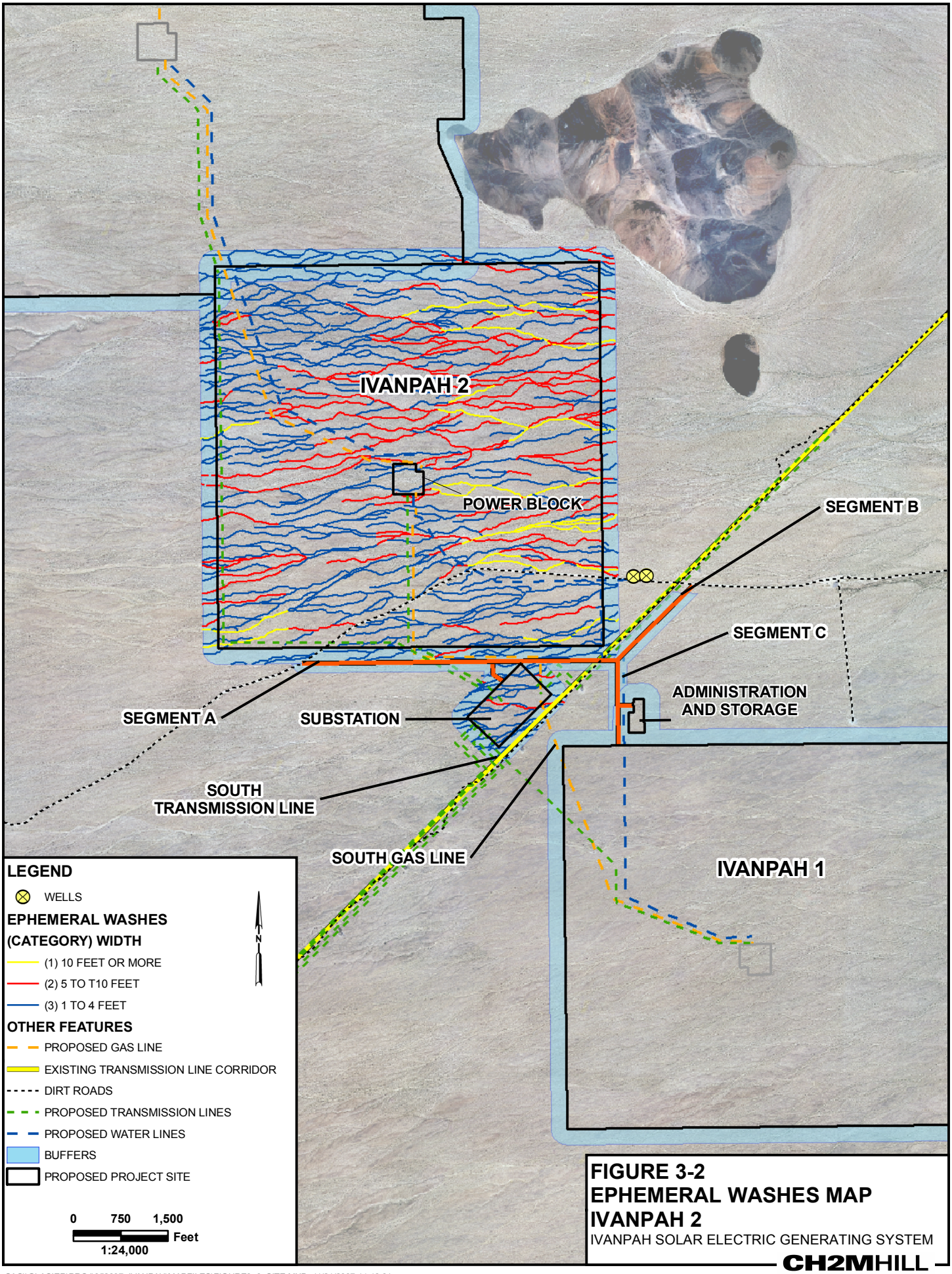


**FIGURE 3-2**
**EPHEMERAL WASHES MAP**
**IVANPAH 2**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

SAC\\GLACIER\PROJ\352897_IVANPAH\MAPFILES\FIGURE3_3_SITE.MXD 11/21/2007 14:18:31

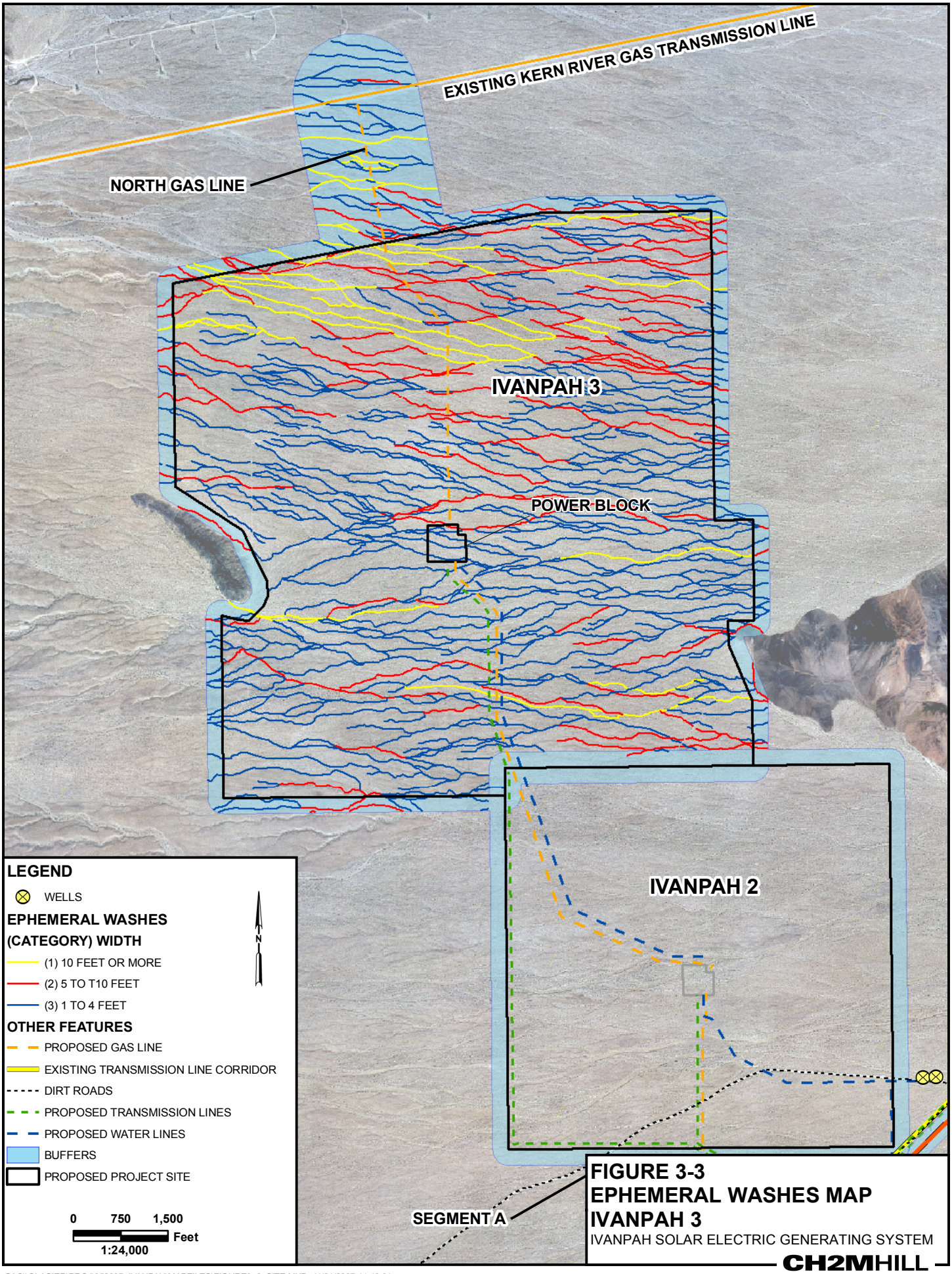


**FIGURE 3-3**
**EPHEMERAL WASHES MAP**
**IVANPAH 3**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

SAC\\GLACIER\PROJ\352897_IVANPAH\MAPFILES\FIGURE3_3_SITE.MXD 11/21/2007 14:18:31

SECTION 4

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APPENDIX A

# 1”=500’ Maps of Study Area

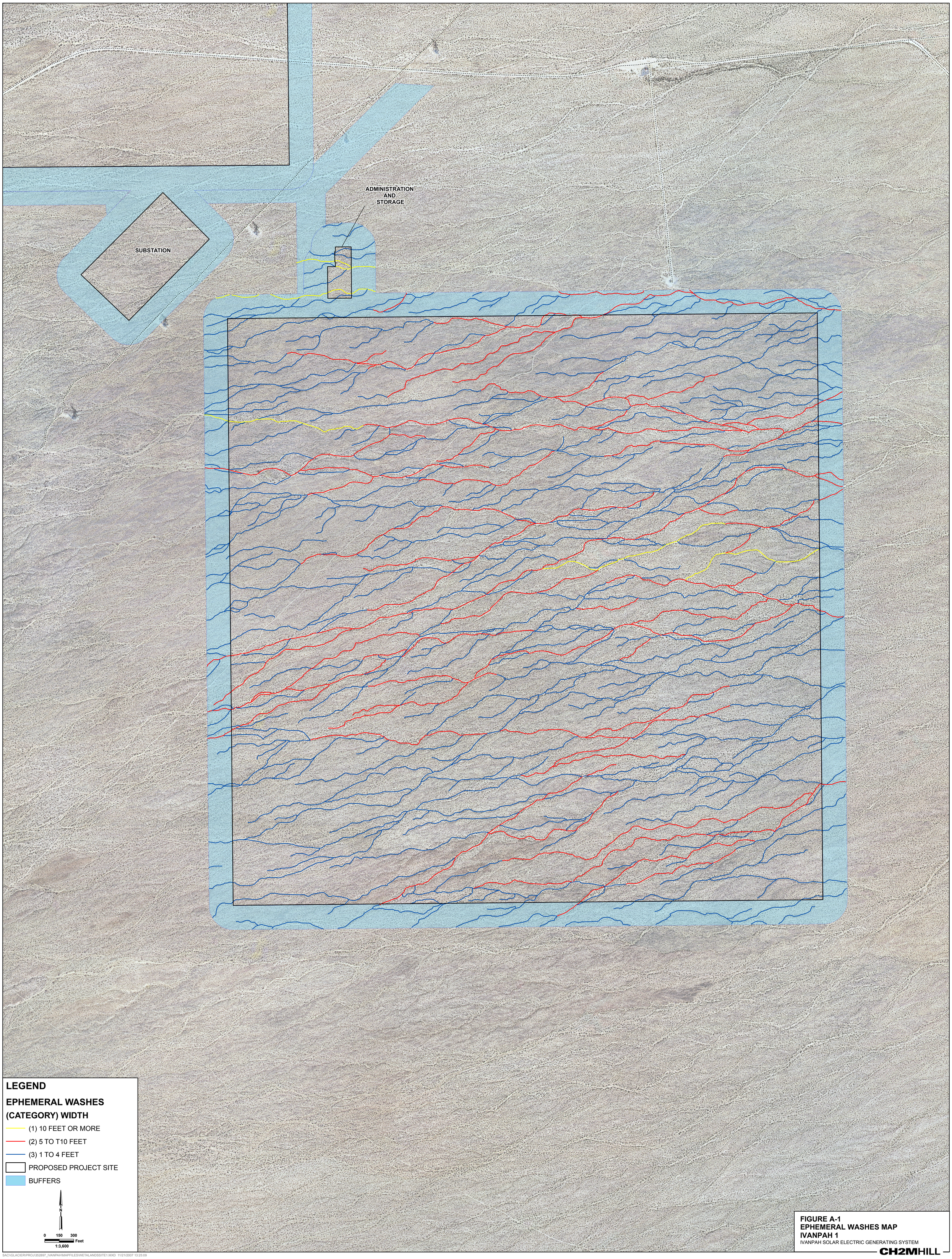


**FIGURE A-1**
**EPHEMERAL WASHES MAP**
**IVANPAH 1**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

**CH2MHILL**

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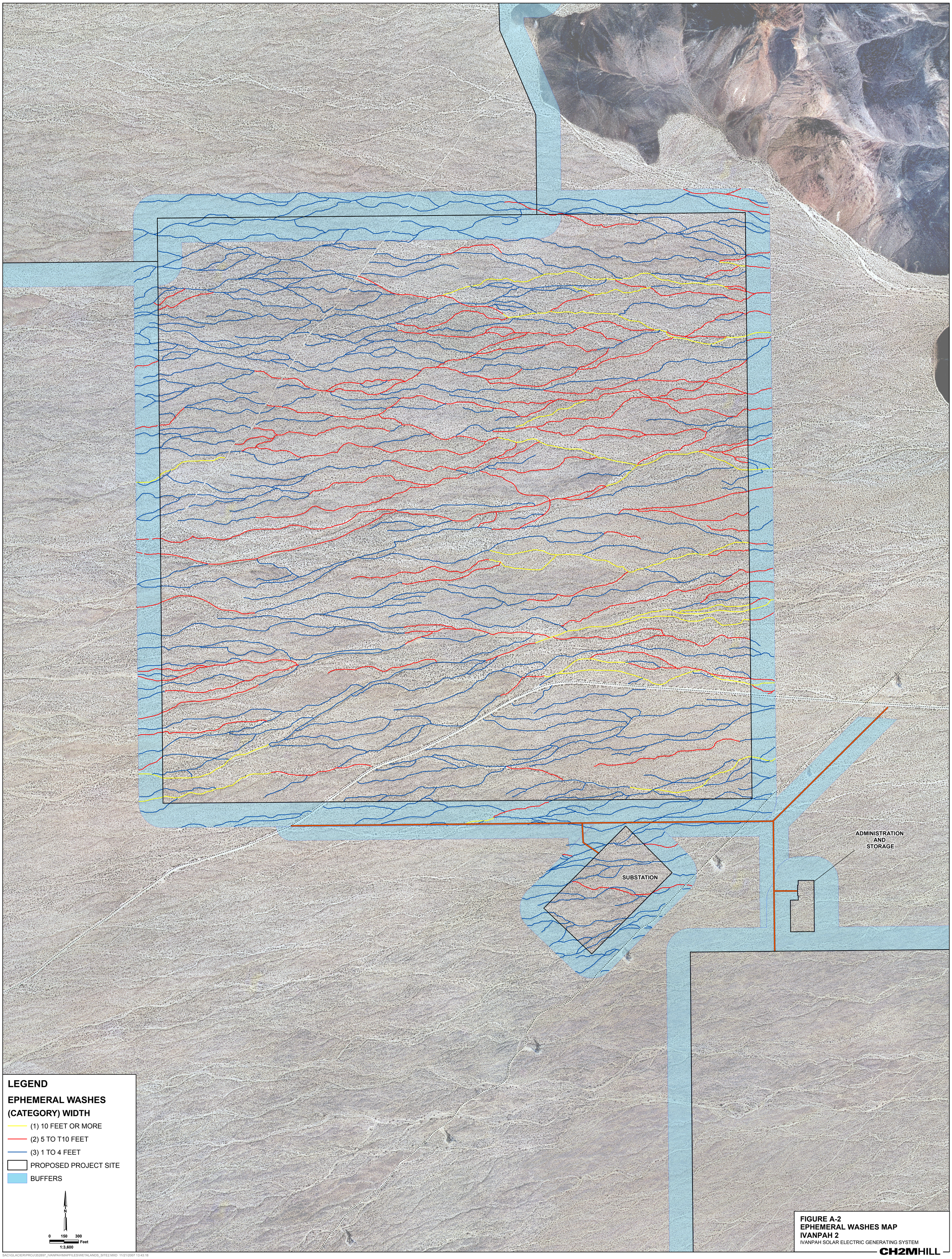


**FIGURE A-2**
**EPHEMERAL WASHES MAP**
**IVANPAH 2**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

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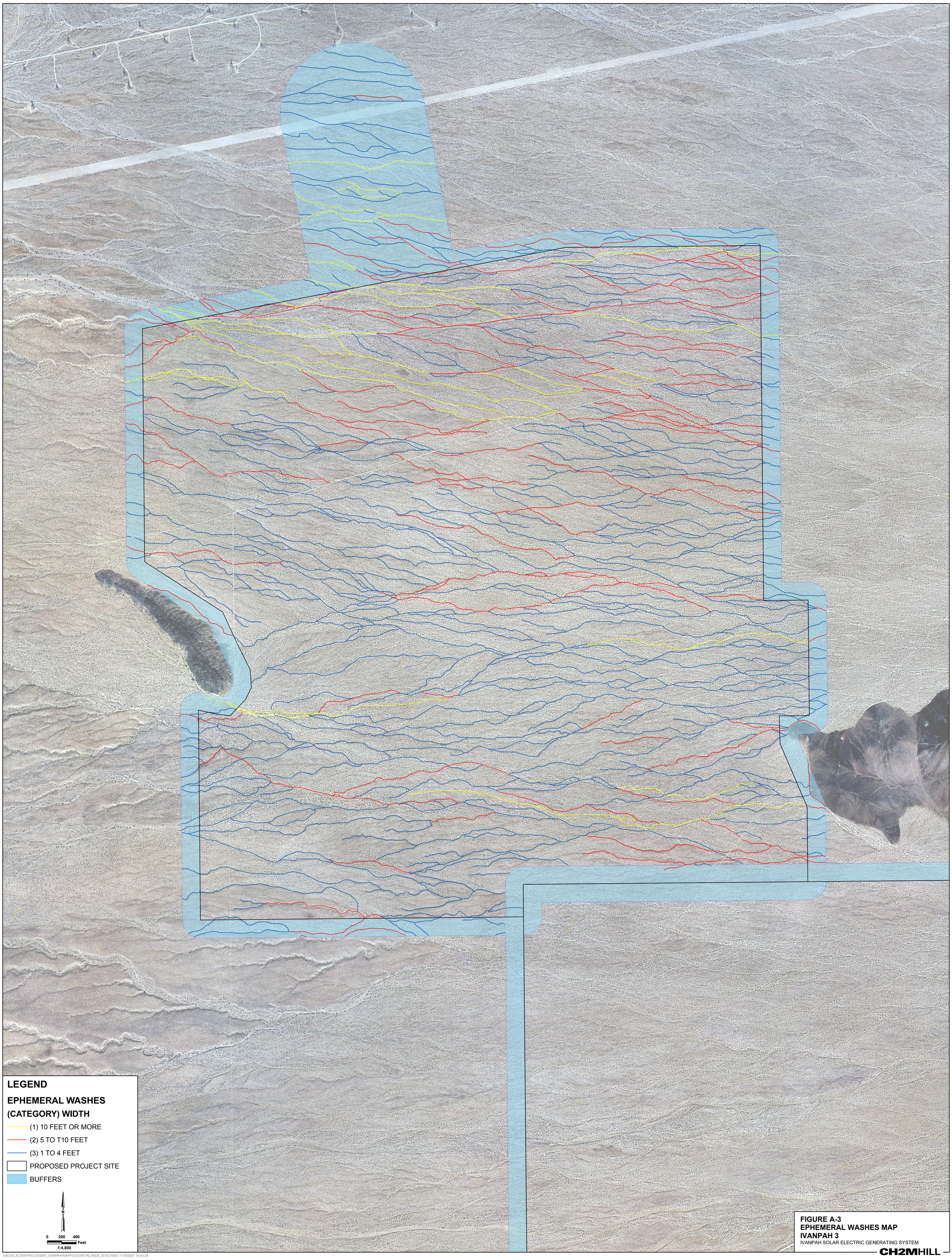


**FIGURE A-3**
**EPHEMERAL WASHES MAP**
**IVANPAH 3**
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM

CH2MHILL

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APPENDIX B

# Representative Photographs

Overview of the project area – looking southeast towards the Ivanpah Dry Lake

Overview of the project area – looking west towards the Clark Mountains

Characteristic creosote brush scrub habitat found throughout the project area

Characteristic creosote brush scrub habitat found throughout the project area

Representative Category 1 (large) Wash

Representative Category 1 (large) Wash

Representative Category 1 (large) Wash

Representative Category 2 (medium) Wash

Representative Category 2 (medium) Wash

Representative Category 2 (medium) Wash

Representative Category 3 (small) Wash

Representative Category 3 (small) Wash

Representative Category 3 (small) Wash

Representative Category 3 (small) Wash