DOCKETED

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Document Title:	OEHI Jurisdictional Delineation
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URS

July 31, 2013

Mr. Jason Deters
Project Manager, California South Branch
U.S. Army Corps of Engineers
Sacramento District, Regulatory Division
1325 J Street, Room 1350

Re: Hydrogen Energy California Wetland Delineation Data Requests

Dear Mr. Deters:

Please find enclosed two items that you requested during our site visit on June 19, 2013:

1) Descriptions of isolated features found within two areas of the modified Hydrogen Energy California, LLC (HECA) footprint; and
2) The Occidental of Elk Hills, Inc. (OEHI) Jurisdictional Delineation.

During the site visit on June 19, 2013 you identified two areas of isolated features along the proposed natural gas pipeline alignment that required additional clarification. The first area includes the depressions between State Route 58 and the railroad tracks near Interstate 5, and the second area is located on the eastern side of Magnolia Avenue, north of Seventh Standard Road.

The enclosed OEHI Jurisdictional Delineation provides additional information that you requested for each of the delineated features along the carbon dioxide pipeline south of the California Aqueduct. The OEHI submittal also includes GIS data for the delineated features.

If you have any further questions, please contact me at 510-874-1733 or Steve Leach at 510-874-3205.

Sincerely,

URS Corporation

Jan Novak
Senior Biologist

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OCCIDENTAL OF ELK HILLS, INC.

CARBON DIOXIDE ENHANCED OIL RECOVERY PROJECT

CO_2 SUPPLY LINE AND PROCESSING FACILITY

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES

Prepared for:

Occidental of Elk Hills, Inc.
10800 Stockdale Highway
Bakersfield, California 93311

Prepared by:

Stantec Consulting Services, Inc.
290 Conejo Ridge Avenue
Thousand Oaks, California 91361

July 9, 2013

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EXECUTIVE SUMMARY

Stantec Consulting Services Inc. (Stantec), on behalf of Occidental of Elk Hills, Inc. (OEHI), conducted a preliminary jurisdictional field delineation of potential Waters of the United States (Waters of the U.S.) on May 29, 30, and 31, 2013. The survey covered lands within the corridor of the proposed Carbon Dioxide (CO_2) Supply Pipeline Alignment and CO_2 Processing Facility location associated with the OEHI CO_2 Enhanced Oil recovery (EOR) Project. With the exception of the northern half of the proposed pipeline alignment, the majority of the Project area was highly disturbed by extensive oil field infrastructure such as active pipelines and access roads through the oil fields. A portion of the California Aqueduct forms the northern boundary of the Project area. The northern portion of the proposed pipeline alignment occurs on gently rolling terrain, while the topography in the southern portion of the Project area occurs in steeply undulating Elk Hills terrain.

Information on vegetation, soils and hydrology was collected in the Project area for evidence of wetlands or other jurisdictional waters and three areas that appeared to meet the three technical criteria of wetlands were found. These areas were artificial wetlands created in uplands by leaking water delivery pipelines, collectively occupying an area of 0.008 acres within the Project area. Other water features mapped across the Project area consisted of non-wetland drainages categorized as ephemeral drainages and gullies. These features were generally very narrow, appearing to only occasionally support surface flows associated with heavy precipitation events. None of these areas contained wetland vegetation or hydric soils. These features were identified by a sometimes small, but perceptible bed and bank. The outer edge of the bed defined the boundaries of these features and was mapped using a Trimble GPS unit with sub-meter accuracy. The majority of these mapped drainages did not exhibit continuous hydrologic connectivity. Mapped gully features were small in extent and associated with recent cut and fill activities around well pads. Ephemeral drainage features occupied 0.49 acres of the Project area and gullies occupied 0.23 acres.

A review of existing site conditions, and recent case law lead Stantec to conclude that the artificial wetlands and non-wetland drainage features mapped during the May 2013 field delineation would not likely be considered jurisdictional, as these features are essentially isolated and do not exhibit hydrologic connectivity to greater “waters of the U.S.” within the region. It is unlikely that any locations within the project area are subject to federal regulation. However, only the USACE can make the final determination as to whether or not wetlands or “other waters” features are subject to federal regulation.

1.0 INTRODUCTION

The Stantec field survey covered lands within a 50 foot corridor of the proposed CO_2 Supply Pipeline, as well as lands surrounding the proposed processing and facility location for the purposes of delineating any potential "Waters of the U.S." Stantec also investigated a number of potential "blue lines" and dark signature features on aerial imagery considered to be potentially jurisdictional and could potentially be impacted by the Project.

The Project area extends approximately 2.5 miles; the California Aqueduct forms the northern boundary and continues south to the proposed CO_2 processing facility. The Project area is located along the southwestern end of the San Joaquin Valley (Figure 1). It can be found on the East Elk Hills U.S.G.S. 7.5 minute quadrangle, Sections 15S, 22S and 27S of Township 30 South, Range 24 East, Mount Diablo Base Meridian (Figure 1). The project area is approximately three miles northwest of the city of Tupman.

The Elk Hills Oil Field is an active oil field containing a network of pipelines, electrical lines, roads, oil well pads, oil derricks and petroleum processing facilities. The Elk Hills is a steep to moderately steep isolated hill formation ending at the Temblor Range to the west and San Joaquin Valley to the north, south, and east. The Elk Hills are in the rain-shadow of the mountains to the west and, therefore, receive little annual rainfall amounting to an average of about 5.75 inches per year. Cut and fill grading of the steep topography associated with oil field infrastructure has disrupted the natural topography and hydrology of the local Elk Hills watersheds; the construction of the California Aqueduct has essentially truncated any hydrologic connectivity of the Elk Hills drainages with the San Joaquin Valley floor.

Waters of the U.S. occurring within the Project area typically include natural and in some cases man-made drainages as well as areas meeting the United States Army Corps of Engineers (USACE's) definition of a wetland. More broadly, Waters of the U.S. as interpreted by the United States Supreme Court in *Solid Waste Agency of Northern Cook County v. Corps of Engineers* (also referred to as the SWANCC decision, see *Memorandum Supreme Court Ruling Concerning CWA Jurisdiction over Isolated Waters* from Gary S. Guzy, General Counsel, U.S.

Environmental Protection Agency) and the U.S Supreme Court decisions *Rapanos v. United States* and *Carabell v. Army Corps of Engineers* in June 19, 2006, include the following:

- All Waters which are currently used, or were used in the past, or may be susceptible to use in intrastate or foreign commerce, including all waters that are subject to the ebb and flow of the tide.
- All interstate waters including interstate wetlands.
- All impoundments of waters otherwise defined as Waters of the United States under the definition.

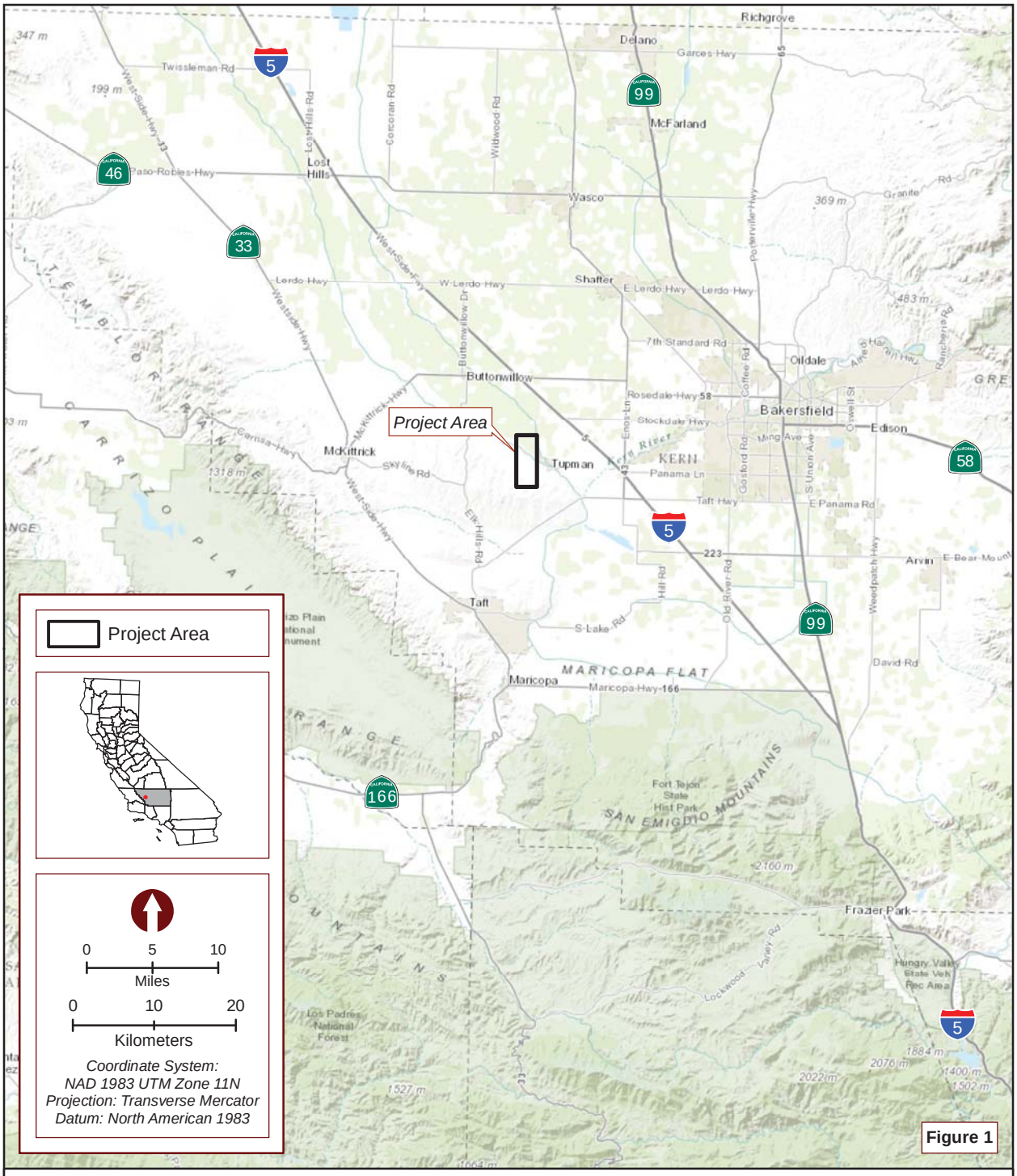
- Tributaries to waters identified above (i.e. first three bullets).
- The territorial seas.
- Wetlands adjacent to waters (other than waters which are themselves wetlands) identified above (i.e. first three bullets), in which a significant hydrologic or biologic nexus occurs.

These waters are subject to the jurisdiction of the USACE according to provisions of Section 404 of the Clean Water Act. Tributary Waters include incised channels that may carry a permanent, intermittent, or ephemeral flow of water. Wetlands are characterized by the presence of wetland hydrology (i.e. surface inundation or saturated soils), hydric soils (soils that have developed under the anoxic conditions imposed by soil saturation), and hydrophytic vegetation (an association of plants adapted to saturated soils). The filling or grading of jurisdictional waters requires a Department of the Army Permit from the USACE per provisions of Section 404 of the federal Clean Water Act.

According to the provisions of Section 401 of the Clean Water Act, no permits can be issued until the state within which the permitted action is to occur has issued a certification that the work will meet state water quality standards. In California, this certification must be obtained from the California Regional Water Quality Control Board that permits the filling or grading of jurisdictional waters.

The California Department of Fish and Wildlife (CDFW) has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1602 of the California Fish and Wildlife Code (CDFW 2010). Activities that would disturb these drainages are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that the applicant will protect the habitat values of the natural drainages by implementing certain measures.

Provisions of the California State Water Code also provide drainages, seasonal pools, and wetlands protection from unregulated development or degradation from construction by identifying such features as waters of the state of California subject to the jurisdiction of the State Water Resources Control Board and its various regional boards. Development within such waters that have not already been identified as Waters of the U.S. is subject to the permit authority of the State of California.



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OCCIDENTAL OF ELK HILLS (OEHI)

Date: July 8, 2013

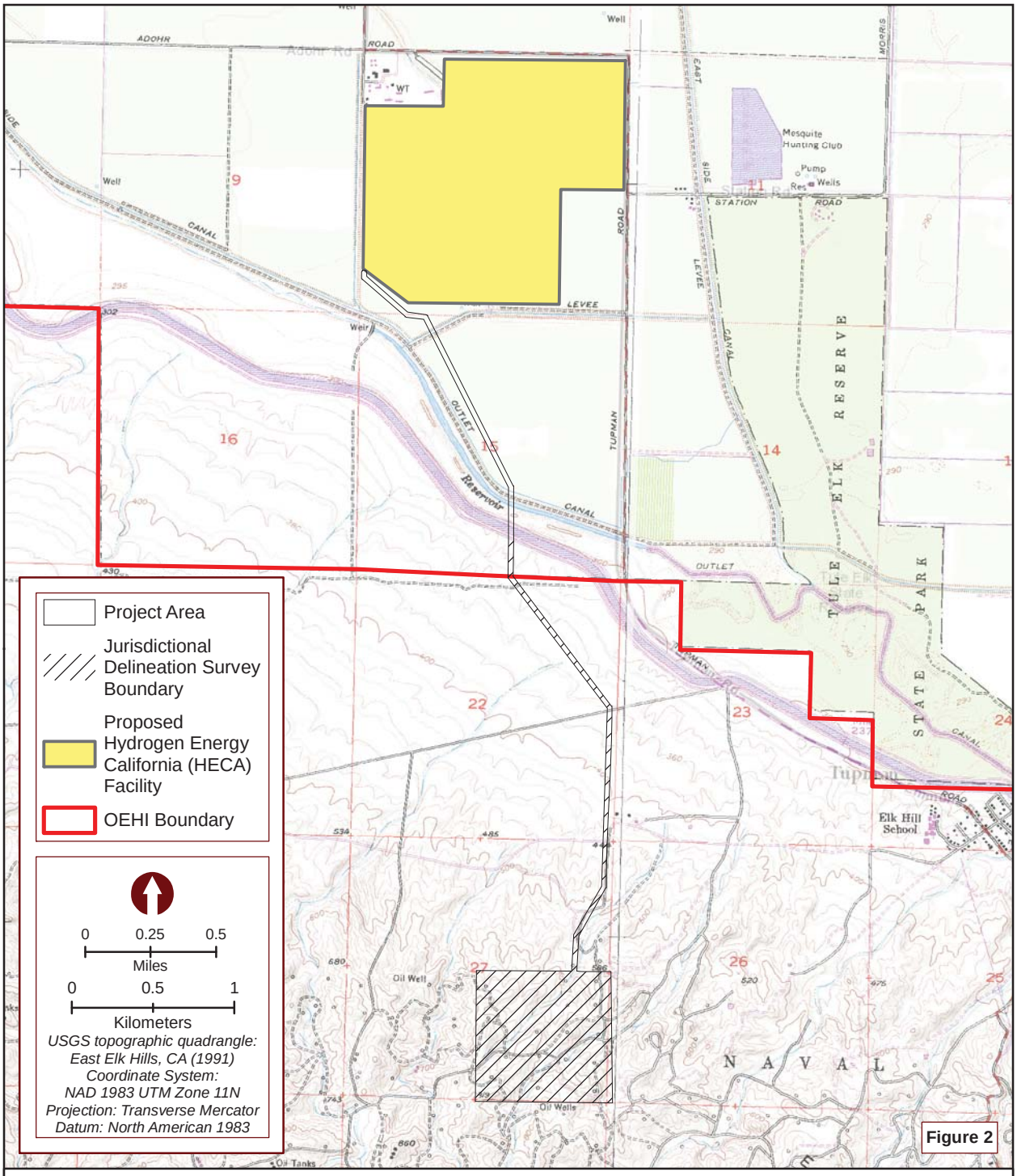
CO_2 ENHANCED OIL RECOVERY PROJECT
JURISDICTIONAL DELINEATION SURVEY
PROJECT VICINITY MAP

1.1 PROJECT BACKGROUND

Hydrogen Energy California (HECA) Project is pursuing coverage under a USACE Nationwide Permit and preliminary delineation results were submitted to the USACE in early March 2013 as part of the Clean Water Act Section 404 permitting process for the HECA Project. HECA provided an information request to OEHI for delineation information for the OEHI Supply Pipeline route and CO_2 Processing site because the (2) projects will share coverage under the same permit.

On June 29, 30 and 31, 2013, Stantec conducted a preliminary jurisdictional delineation to determine the extent of any potentially jurisdictional wetlands or “other waters” features that may occur along the proposed CO_2 Supply Line alignment and proposed CO_2 Processing Facility in support of the proposed Project.

This effort included the analysis of potential ordinary high water mark indicators in eight areas specified on a map provided by HECA. The features surveyed are shown in figures 4.1 through 4.6. A description of each feature along with its source of hydrology and the presence/absence of a “Significant Nexus” can be found in Appendix A.



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CO_2 ENHANCED OIL RECOVERY PROJECT
JURISDICTIONAL DELINEATION SURVEY
PROJECT LOCATION MAP

2.0 METHODS

Stantec wetland ecologists Mr. Christopher Bronny and Mr. Tom Fardig conducted a preliminary jurisdictional delineation of the Project area on May 29, 30, and 31, 2013. The field delineation was conducted by walking the proposed CO_2 Supply Line alignment within a 50 foot buffer, as well as driving and walking the area around the proposed CO_2 Processing Facility at the southern end of the Project area. The field delineation was consistent with guidelines found in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), *Minimum Standards for Acceptance of Preliminary Wetland Delineations* (USACE 2001), *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manuel: Arid West Region* (Environmental Laboratory 2006), and *A field Guide to the Identification of the Ordinary High Water Mark in the Arid west Region of the Western United States (2008).*

Data was collected on vegetation, soils, and hydrology using wetland determination protocol as described in the 1987 and 2006 *Arid West* Manuals. Both upland and wetland data were collected to distinguish wetland boundaries from the adjacent upland; in some cases, single descriptive waypoints were taken to characterize the existing vegetation, soils, and hydrology of an area. On paired data points, a sample point was sited in an area exhibiting wetland characteristics, while a second sample point was sited up slope of the first point in an upland position that defined the transitional break between wetland and upland. No soil test pits were taken within potential aquatic features that were confined to channels, thus conforming to the definition of “other waters” of the U.S. (i.e., exhibits a distinct bed and bank, with an ordinary high water mark (OHWM). GPS coordinates of each sample location were recorded in the field using a Trimble GEO XT. A shape file of the project area downloaded onto the Trimble GEO XT GPS unit as well as aerial photos with the project area overlaid on top of them were used to aid the survey effort.

A total of four sample points were established on two paired transect lines within the Project area to delineate the boundaries of three mapped artificial wetlands; the upland positions are distinguished by “A” and the wetland positions “B.” A total of six single “descriptive waypoints” were taken in areas to characterize portions of the Project area that suggested marginal wetland habitat, but do appear to meet all three parameters to be considered a potentially jurisdictional “waters of U.S.” Information recorded on *Arid West* data forms are provided in Appendix E and Appendix F. Delineation digital data files are provided in Appendix G.

The terms “ephemeral drainage” or “gully” as used in this report refers to a drainage feature with a defined bed and bank. Drainage channels observed within the Project area were visually inspected for wetland characteristics and physical characteristics associated with an ordinary high water mark (OHWM) in order to determine the extent of possible jurisdiction. The boundaries of each feature within the Project area were mapped using a Trimble GPS unit with sub-meter accuracy. The Project area was examined for natural and engineered drainages. The limits of likely federal jurisdiction (OHWM) were guided by the use of the *Arid*

West Ephemeral and Intermittent Streams OHWM Datasheet and a Trimble GPS unit. Water features within the Project area were generally very narrow (often only a few feet in width) and very intermittent; therefore, delineating the boundaries of these features was based on the presence and extent of a noticeable bed and bank. A total of five OHWM data form sets were recorded for representative ephemeral drainages found throughout the Project area; information recorded on these forms can be found in Appendix E.

The approximate location and extent of jurisdictional wetlands/waters as well as other relevant data, were transferred on to a 1"= 200' scale topographical map of the Project area in the field. Representative photographs of the Property can be found in Appendix C.

Precipitation amounts during the 2012-2013 rainy season were below-average. Weather conditions at the time of the May 2013 field delineation were sunny and clear, with mid-day temperatures approximately 90 degrees Fahrenheit. Winds were generally calm, with occasional light gusts.

2.1 USACE DEFINITION OF WETLANDS/WATERS

Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are:

(a) The presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by ground water or surface water; and

(b) A prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytic vegetation).

Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Positive wetland indicators of all three parameters are normally present in wetlands. The assessment of all three parameters enhances the technical accuracy, consistency, and credibility of wetland determination and is required per the 1987 Corps Manual.

Aquatic habitats, other than wetlands, that are considered to be waters of the United States were also investigated as part of this study. Their landward extent was defined following the definitions provided in the Corps of Engineers regulations [33 CFR §328.4(a) (b) and (c)]:

(a) Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles.

(b) Tidal Waters of the United States. The landward limits of jurisdiction in tidal waters:

(1) Extends to the high tide line, or

(2) When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in (c) below.

(c) Non-Tidal Waters of the United States. The limits of jurisdiction in non-tidal waters:

(1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark,

(2) When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands, or

(3) When the water of the United States consists only of wetlands, the jurisdiction extends to the limit of the wetlands.

Tributary waters and their impoundments are under the regulatory jurisdiction of the Corps and extend to the OHWM on opposing channel banks. Tributary waters include rivers, streams and seasonal drainage channels. The OHWM is typically indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in character of soil, destruction of vegetation, exposed roots on the bank, deposition of leaf litter and other debris materials or lower limit of moss growth on channel banks.

Areas meeting the regulatory definition of “Waters of the United States” (jurisdictional waters) are subject to the jurisdiction of the Corps. The Corps under provisions of Section 404 of the Clean Water Act (1972) has jurisdiction over “Waters of the U.S.” These waters may include all waters used or potentially used for interstate commerce. This includes all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sand flats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as “Waters of the U. S.,” tributaries of waters otherwise defined as “Waters of the U. S.,” the territorial seas, and wetlands adjacent to “Waters of the U.S.” (33 CFR, Part 328, Section 328.3).

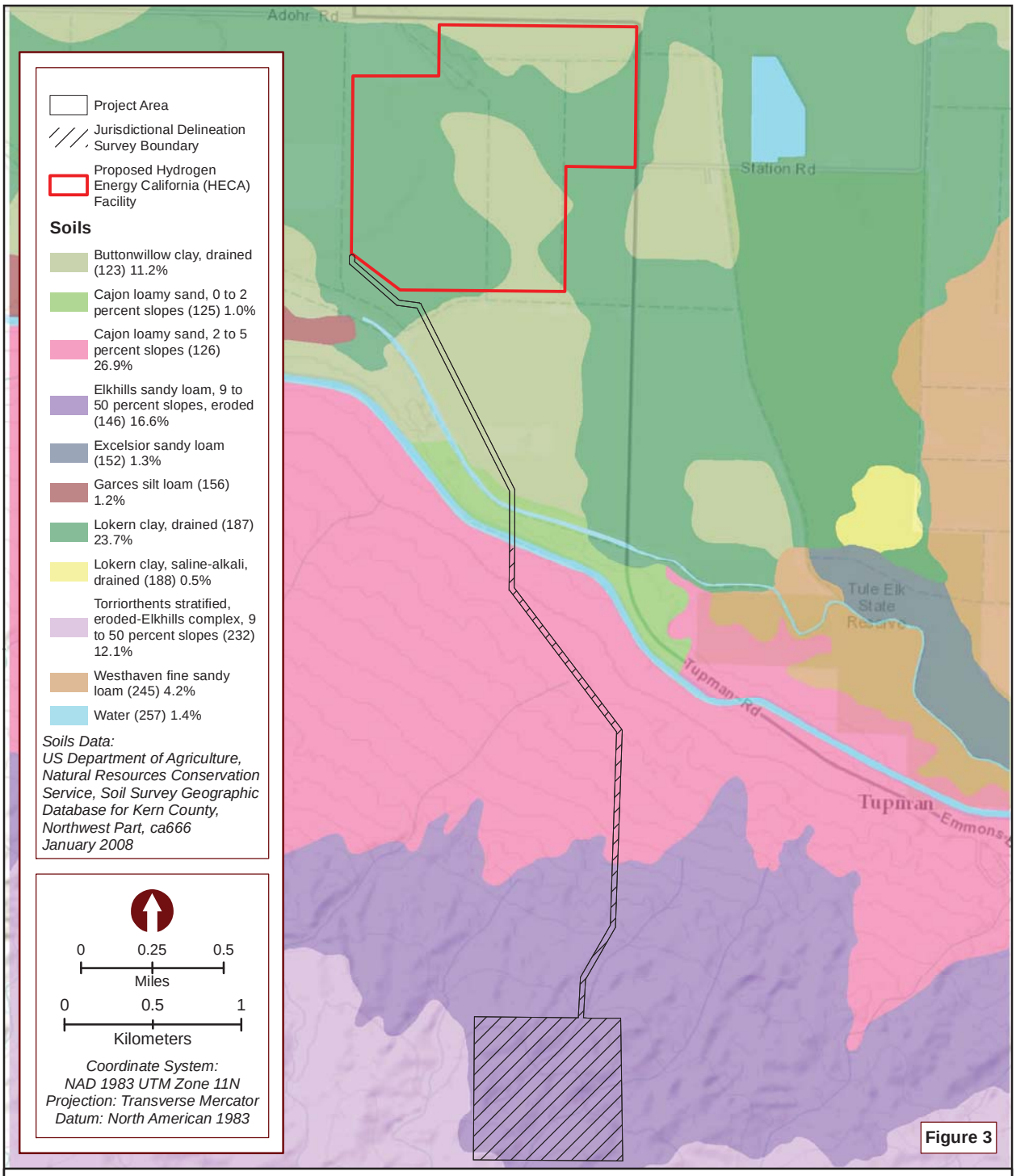
Areas not considered to be jurisdictional waters include non-tidal drainage and irrigation ditches excavated on dry land, artificially-irrigated areas, artificial lakes or ponds used for irrigation or stock watering, small artificial water bodies such as swimming pools, and water-filled depressions with no outlet for drainage (33 CFR, Part 328).

3.0 RESULTS

The Project area is located in Kern County along the southwestern end of the San Joaquin Valley. The Project area investigated lies within a section of deeply dissected low hills along the southern half; the topography is gently rolling in the northern half. Elevations range from approximately 765 feet above mean sea level (msl) along the south-central boundary of the Project area to approximately 316 feet above msl at the northern terminus. When significant storm events occur, runoff is intercepted by the various swales and drainages which drain to the north and northeast into the larger system of drainages which exit the Elk Hills. Surface waters conveyed by these drainages either naturally terminate and dissipate in the flat terrain of the valley floor or artificially terminate on the south side of the California Aqueduct, which forms a barrier between the Elk Hills Watershed and the San Joaquin Valley floor.

The Project area occurs within the Tulare-Buena Vista Lakes Watershed (HUC#18030012). Potential "Waters of the U.S." occurring within the Project area included non-wetland ephemeral drainages and gullies, as well as three artificial wetland features resulting from a leaky utility water delivery pipeline. Nearly all of these areas are small fragments of a once larger natural drainage network which is now regularly interrupted by numerous road crossings and/or cut and fill grading associated with oil production infrastructure. The remainder of the Project area consisted of a network of non-jurisdictional swales and upland terrain that contained existing pipelines, parallel and cross roads, well pads, and cut and fill grading which lacked any evidence of a bed and bank.

Three soil mapping units have been identified within the project area (NRCS 2013). Table 1 provides a list and physical characteristics of the three soil mapping units, additional soils information is presented in Appendix D. The majority of the Project area consists of Cajon loamy sand, 2 to 5 percent slopes and Elkhills sandy loam, 9 to 50 percent slopes, eroded.



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CO_2 ENHANCED OIL RECOVERY PROJECT
JURISDICTIONAL DELINEATION SURVEY
SOILS MAP

TABLE 1. SOILS OF THE PROJECT AREA					
Soil Mapping Unit	**Map Symbol**	**Parent Material**	**Drainage Class**	**Hardpan/ Duripan**	**Hydric**
Cajon loamy sand, 0 to 2 percent slopes	126	Alluvium derived from mixed and/or lacustrine deposits	Well Drained	No	No
Elkhills sandy loam, 9 to 50 percent slopes, eroded	146	Igneous and sedimentary rock	Well Drained	No	No
Torriorthents stratified, eroded-Elkhills complex, 9 to 50 percent slopes	232	Alluvium derived from igneous and sedimentary rock	Well Drained	No	No

3.1 POTENTIAL WATERS OF THE U.S.

Non-wetland ephemeral drainages and gullies, as well as three man-made wetland features occur within the Project area. These features, although unlikely, have the potential to fall under the jurisdiction of the USACE. The location of these features on orthorectified aerial photos is presented on Figure 4. Representative photographs of mapped water features are presented in Appendix B.

3.1.1 Areas meeting the Technical Criteria of Jurisdictional Wetlands

While there are numerous swales occurring throughout the Project area, no features met the definition of a "wetland swale," as they lacked a prevalence of hydrophytic vegetation, absence of hydric soil indicators, and exhibited only one secondary hydrologic indicator (i.e., "drainage pattern"). Of all the potential wetland features assessed during the May 2013 field delineation, three locations within the Project area appeared to meet all three technical criteria of wetlands. Information on two of these mapped features was recorded on Arid West data forms and corresponds with USACE data point locations DP150 (see DP150a, -150b, -150c, and -150d; (Appendix F). The following conditions were observed: Surface water was present within these areas and thus soils were saturated. Additionally, hydric soil indicators were observed in the soil test pits (e.g., hydrogen sulfide; gleyed soils) and wetland indicator plants were dominant in the sample areas.

DP150b – Artificially induced wetland created by leaky water pipes. This feature is located in upland and occurs as a small basin beneath the pipes. Hydrologic inputs appear year-round/continuous, creating a suitable moisture regime to support a prevalence of hydrophytic species including black willow (*Salix gooddingii*; FACW), narrow-leaved cattail (*Typha angustifolia*; OBL), Coulter's horseweed (*Laennecia coulteri;* FAC), and rabbit's-foot grass (*Polypogon monspeliensis*; FACW). Mapped wetland boundaries were based on the limits of soil saturation. This feature occupied 0.008 acres of the Project area.

DP150d - Artificially induced wetland created by leaky water pipes. This feature is located downslope from DP150b and occurs as a linear feature confined to a narrow saturation zone. Hydrologic inputs appear year-round/continuous, creating a suitable moisture regime to support a prevalence of hydrophytic species including black willow (FACW), narrow-leaved cattail (OBL), Coulter's horseweed (FAC), rabbit's-foot grass (FACW), and Jersey cudweed (*Pseudognaphalium luteoalbum*; FAC). Mapped wetland boundaries were based on the limits of soil saturation. This feature occupied 0.008 acres of the Project area.

3.1.2 Other Waters

Due to the lack of hydrological conductivity, all the ephemeral drainages and gullies mapped during the May 2013 field delineation are non-jurisdictional and would not be considered tributary waters.

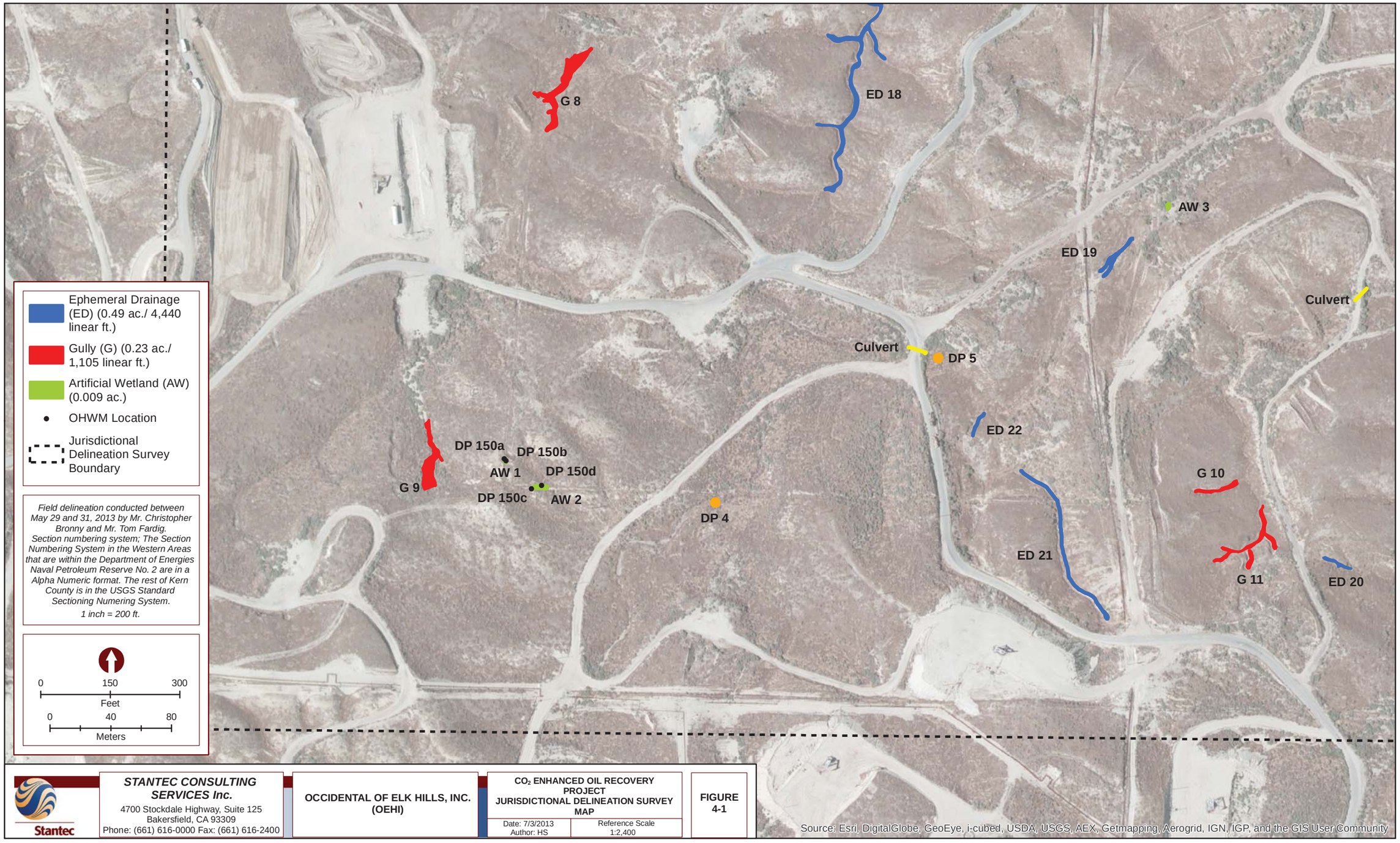
Depending on the slope, mapped ephemeral drainages in the northern portion of the Project area are low-gradient features that exhibit intermittent scour within a defined bed and bank; the majority of ephemeral drainages located in the southern portion occur at the head of natural drainages and occupy the thalweg between moderately steep hillslopes. While all mapped features exhibited a drainage pattern, nearly all contained a prevalence of upland vegetation (or in some cases sparsely vegetated). Formal soil test pits in some of these features revealed an absence of hydric soil indicators. Typical herbaceous and woody vegetation observed in these features included red brome (*Bromus madrietensis* ssp. *rubens*; UPL), schismus grass (*Schismus barbatus*; UPL), valley lessingia (*Lessingia glandulifera* var. *glandulifera*; UPL), fiddleneck (*Amsinckia* sp.; UPL), California matchweed (*Gutierrezia california*; UPL) and allscale saltbush (*Atriplex polycarpa*; FACU). These areas occupied a total of 0.49 acres of the Project area. Gully features often occurred on the steep fill slope of an existing oil well pad. Due to heavy scour associated with significant precipitation events, vegetation was often sparse. These areas occupied 0.23 acres of the Project area.

3.2 OTHER AREAS

The remainder of the Project area consisted of pipeline infrastructure, roadways, and a mosaic of annual grassland and chenopod scrub.

Chenopod scrub habitat is characterized by scattered woody shrub cover consisting of various species of saltbush shrubs (Family *Chenopodiaceae*) and other subshrubs on mostly highly saline-alkaline soil substrates. Chenopod scrub habitat in the Project area is largely dominated by allscale saltbush, although California matchweed, spiny saltbush (*Atriplex spinifera*), cheesebush (*Ambrosia salsola*), alkali goldenbush (*Isocoma acradenia*), and bladder pod (*Isomeris arborea*) can occur as sub-dominants in the shrub layer. Prior to Euro-American settlement of the region, the herbaceous groundlayer consisted of native annual grasses and forbs (i.e., wildflowers); this component has now been largely replaced by invasive non-native grasses of Eurasian origin. Dominant non-native annual grasses observed within the Project area included red brome, schismus grass, ripgut brome (*Bromus diandrus*), and wild oat (*Avena*

spp.); non-native broad-leaved plants were generally sparse in their overall percent cover in the herbaceous groundlayer and included red-stemmed filaree (*Erodium cicutarium*). With the exception of a few hillslope remnants which included scattered stands of bluegrass (*Poa* sp.), native grasses were largely absent. In terms of their overall frequency, density, and distribution, native forbs were moderately abundant within the herbaceous groundlayer and included fiddleneck, valley lessingia, freckled milkvetch (*Astragalus lentiginosus* var. *nigricalycis*), shining pepperweed (*Lepidium nitidum*), California sand-aster (*Corethrogyne filaginifolia*), rattlesnake weed (*Chamaesyce albomarginata*), jimson weed (*Datura wrightii*), wire-lettuce (*Stephanomeria pauciflora*), phacelia (*Phacelia* sp.), and popcorn flower (*Plagiobothrys* sp.).



Stantec	**STANTEC CONSULTING SERVICES Inc.** 4700 Stockdale Highway, Suite 125 Bakersfield, CA 93309 Phone: (661) 616-0000 Fax: (661) 616-2400	**OCCIDENTAL OF ELK HILLS, INC. (OEHI)**	**CO_2 ENHANCED OIL RECOVERY PROJECT** **JURISDICTIONAL DELINEATION SURVEY MAP** Date: 7/3/2013 Author: HS Reference Scale 1:2,400	**FIGURE 4-1**

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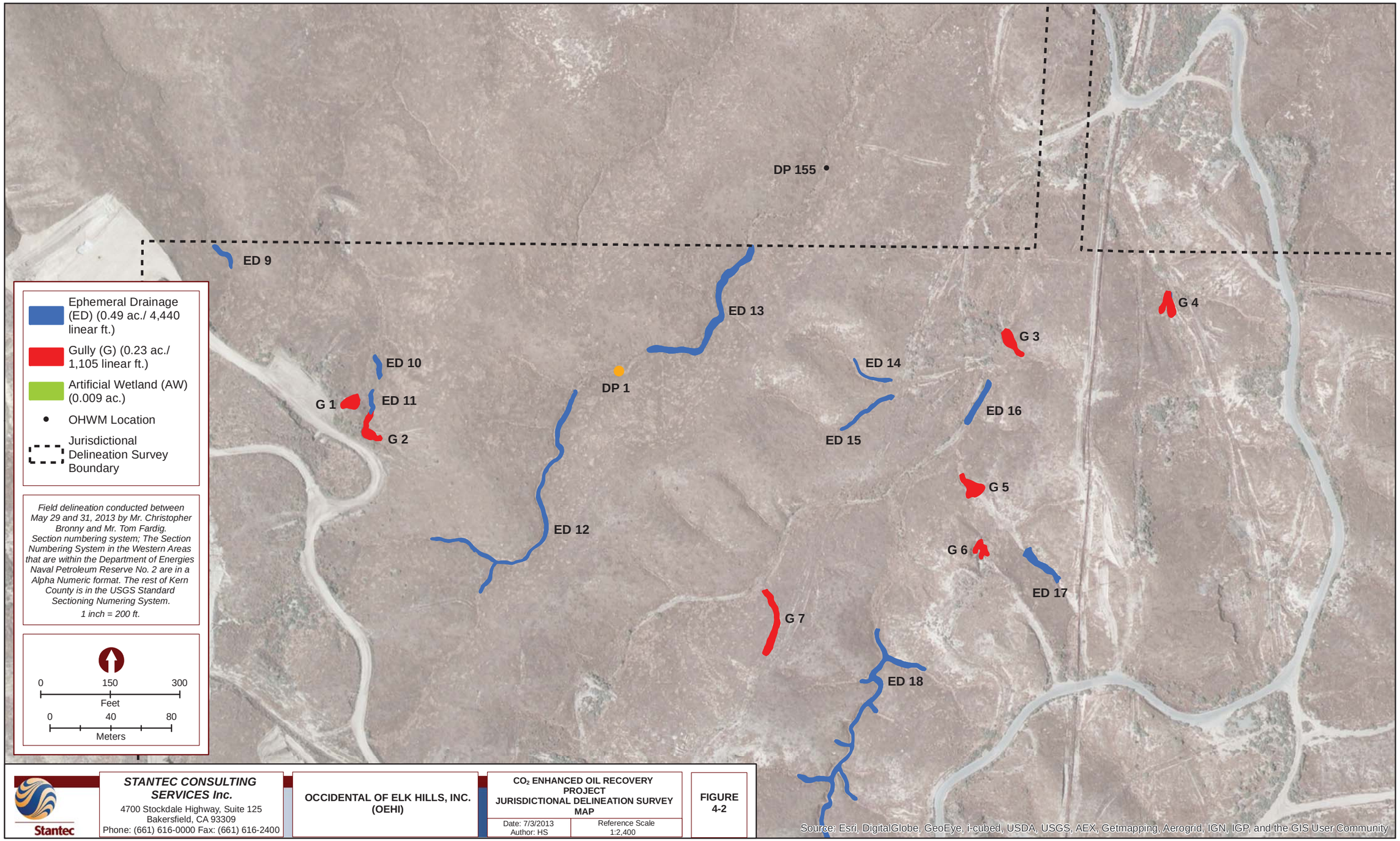

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Date: 7/3/2013
Author: HS

Reference Scale
1:2,400

FIGURE 4-2

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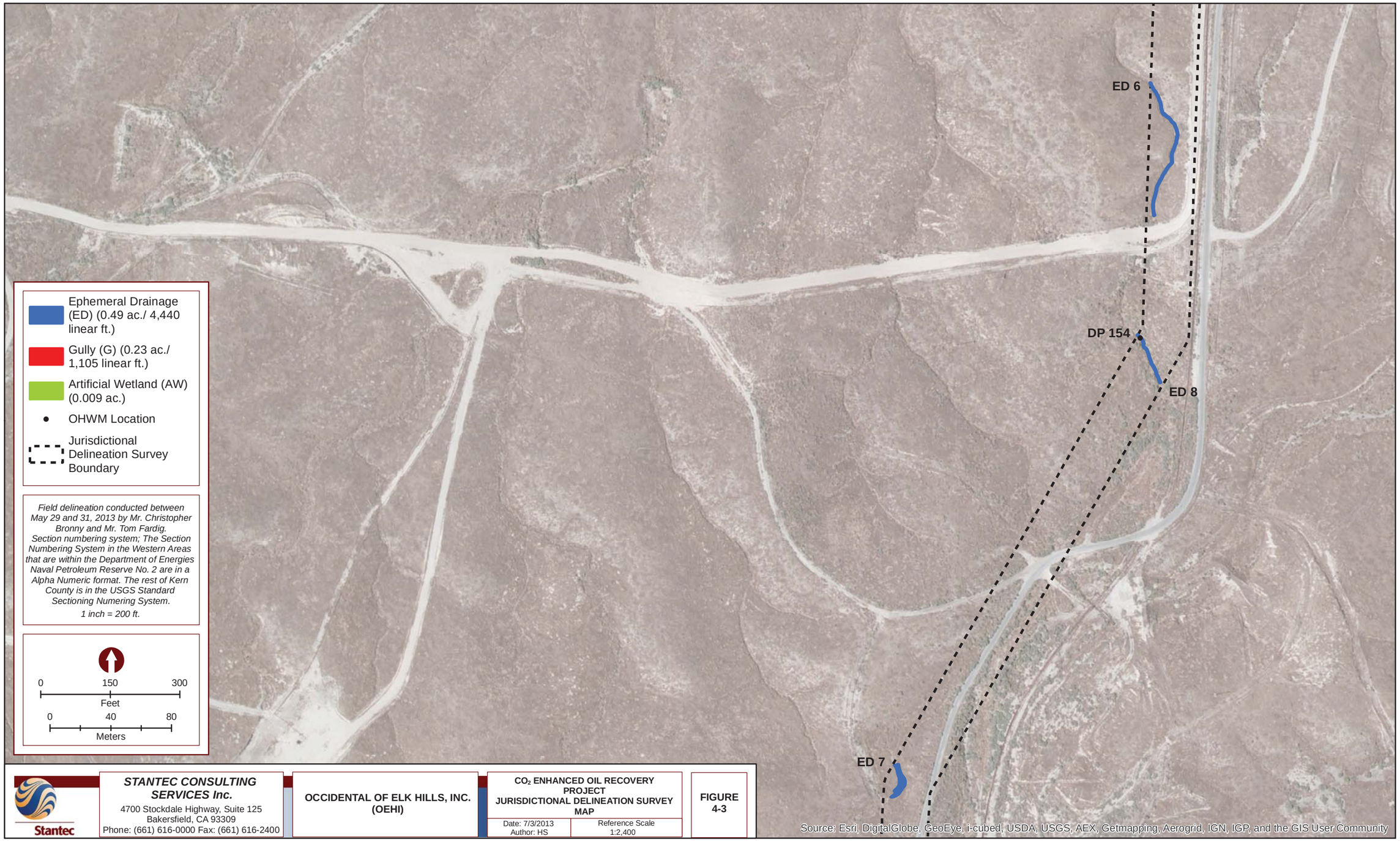

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Date: 7/3/2013
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Reference Scale
1:2,400

FIGURE 4-3

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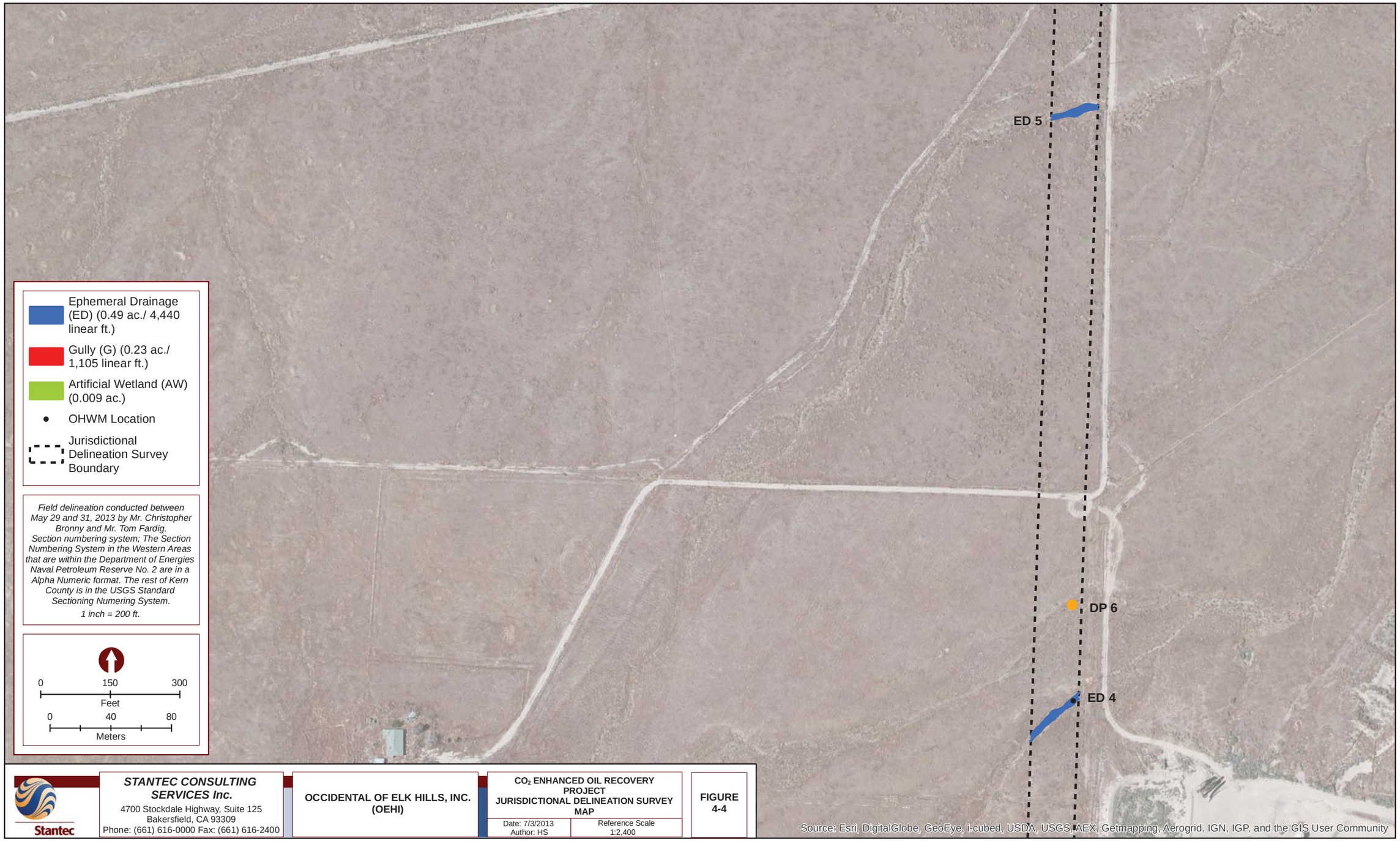

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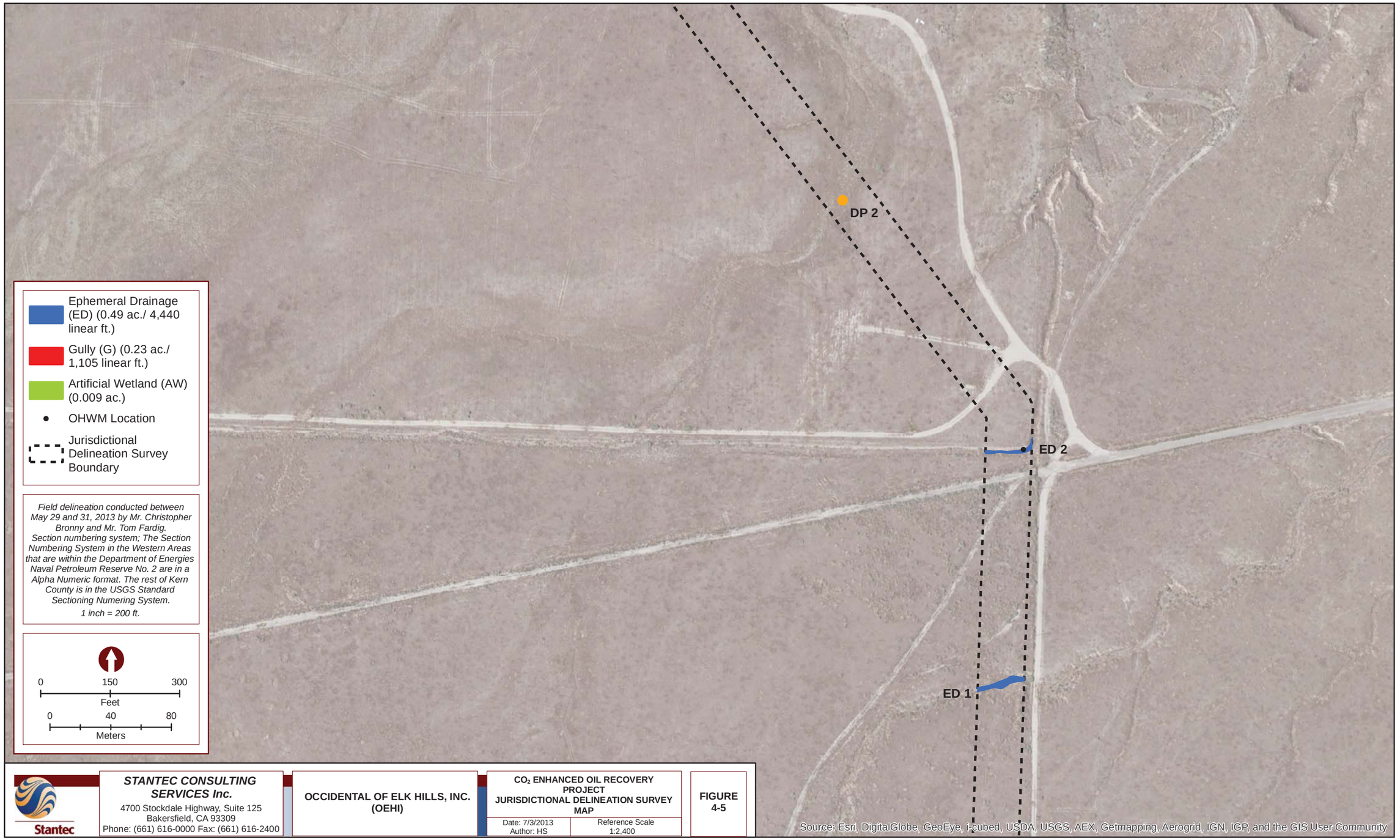
CO_2 ENHANCED OIL RECOVERY PROJECT
JURISDICTIONAL DELINEATION SURVEY MAP

Date: 7/3/2013
Author: HS

Reference Scale
1:2,400

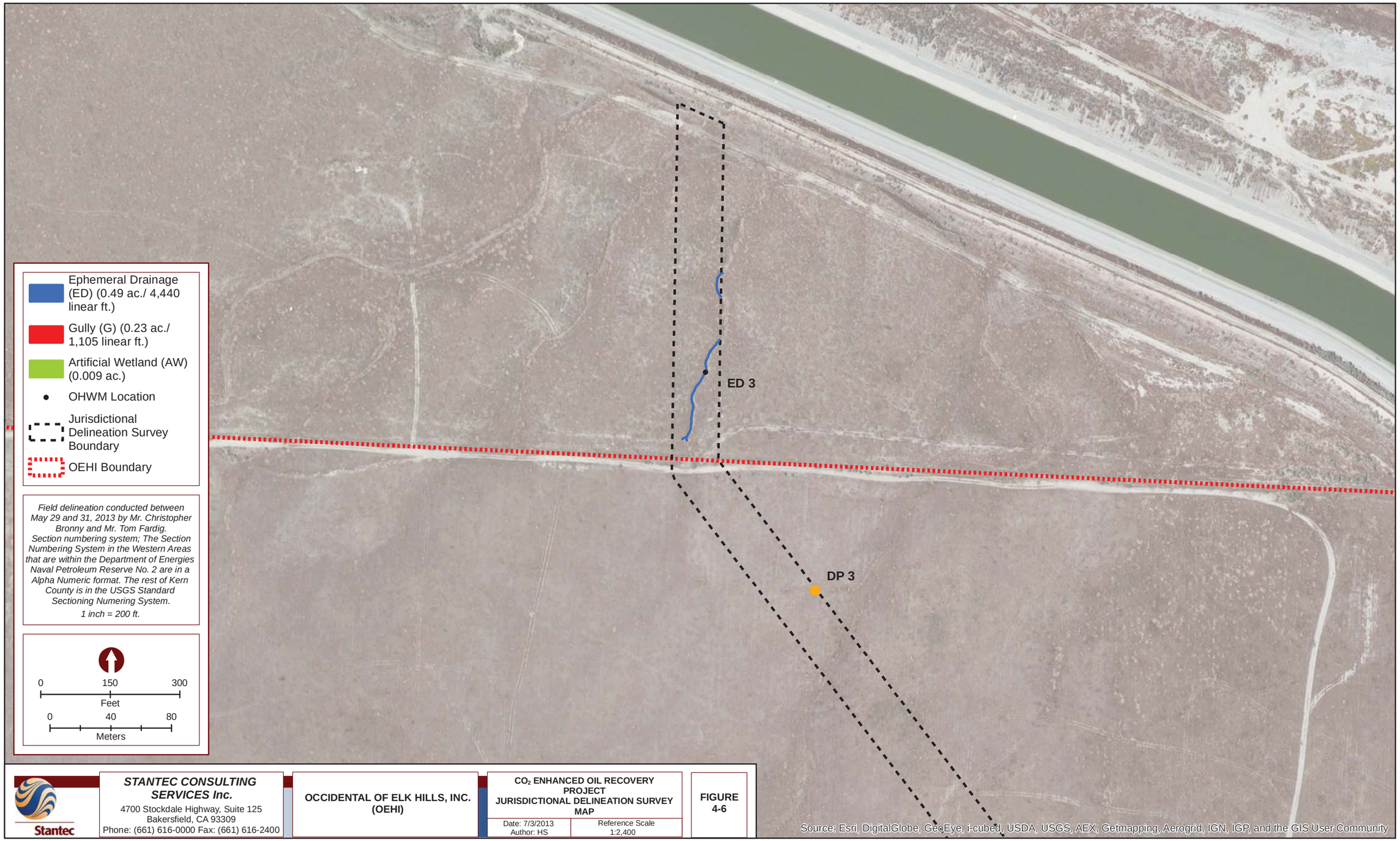
FIGURE 4-4

Document Path: Z:_mxds\HECA_jurisdictional delineation_figure 4-4_.mxd



STANTEC CONSULTING SERVICES Inc. 4700 Stockdale Highway, Suite 125 Bakersfield, CA 93309 Phone: (661) 616-0000 Fax: (661) 616-2400	**OCCIDENTAL OF ELK HILLS, INC. (OEHI)**	**CO_2 ENHANCED OIL RECOVERY PROJECT** **JURISDICTIONAL DELINEATION SURVEY MAP** Date: 7/3/2013 Author: HS Reference Scale 1:2,400	**FIGURE 4-5**

Document Path: Z:_mxds\HECA_jurisdictional delineation_figure 4-5_.mxd



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Document Path: Z:_mxds\HECA_jurisdictional delineation_figure 4-6_.mxd

4.0 DISCUSSION

This discussion outlines the basis for the assertion that features mapped in this investigation would continue to be considered non-jurisdictional by the USACE. Based on the examination of aerial imagery and topographic maps and the findings from our May 2013 field delineation, it appears that the drainages of the Elk Hills naturally terminate in the valley floor below the hills or artificially terminate at the levee of the California Aqueduct, and therefore exhibit no hydrologic connectivity to any Waters of the U.S. Aside from the investigation of the physical characteristics and history of the Elk Hills hydrology, recent case law and its influence on how the USACE may now perceive the jurisdictional status of mapped water features was reviewed. In January of 2001 the U.S. Supreme Court ruled in the SWANCC decision that “non-navigable, isolated, intrastate” waters could not be claimed as jurisdictional by the USACE on the basis of their use by migratory birds (Guzy 2001). Although the Court did not specifically address the meaning of the word “isolated,” it upheld the jurisdictional status of “adjacent” wetlands (and other waters), which are by definition wetlands that are “bordering, contiguous, or neighboring” other jurisdictional waters. Therefore, the term “isolated wetland” has implicitly been defined as ‘wetlands that are not bordering, contiguous, or neighboring’ other jurisdictional waters.

This definition does not, however, address the degree of proximity necessary to establish that one wetland (or other water) is “adjacent” to known jurisdictional waters. As established by the Supreme Court in the *United States v. Riverside Bayview Homes, Inc.* in 1985 “wetlands separated from other waters by man-made dikes or barriers, natural river berms, beach dunes, and the like are ‘adjacent wetlands’” (Guzy 2001). Recently these definitions have been further modified by the U.S Supreme Court decisions *Rapanos v. United States* and *Carabell v. Army Corps of Engineers,* June 19, 2006, which imposes a "significant nexus" test for federal jurisdiction over wetlands. What determines a significant nexus is somewhat unclear; however, the USACE has developed guidance that establishes criteria for assessing a significant nexus that considers hydrologic and biologic factors.

Based on the outcome of these court cases, no change in the interpretation of the federal jurisdiction over non-wetland drainages can be found. However, a change in federal regulation over wetlands has occurred. Based on the SWANCC decision, the artificial wetland features mapped in the Project area would be less likely to be considered jurisdictional. If the non-wetland drainages are not jurisdictional, then according to the SWANCC decision the artificial wetlands, not being adjacent to a Water of the U.S., would be considered isolated and therefore be exempt from USACE jurisdiction. Given the distance between these isolated features and a known Water of the U.S., it is extremely doubtful a significant nexus could be established between these features and a Water of the U.S. However, if the non-wetland drainages of the site are considered jurisdictional by the USACE, then the man-made wetlands would, therefore, likely be considered jurisdictional due to their adjacency to a near-by “other waters” (i.e., exhibit a “significant nexus”).

This discussion of the mapped wetlands leads to another consideration: whether these artificial wetlands are jurisdictional in their own right. Some man-made features such as reflecting ponds, most irrigation ditches, sewage treatment ponds, etc., are not considered jurisdictional by the USACE. Man-made features or, to be more precise, human-induced wetlands are only potentially jurisdictional after five years, in which the USACE considers new normal circumstances to be in place rendering such wetlands potentially jurisdictional. Within the Project area, the three mapped artificial wetlands appear to have been in existence for no more than five years based on the sapling size of the black willow and salt cedar; however, the hydrophytic herbaceous component may have been in place longer than five years. All three of the mapped artificial wetlands were created by leaking utility water delivery pipelines; two were located at the top of a hill and Water from the leaks ran downhill along a ravine and created AW-1 and AW-2, as shown on Figure 4-1. The artificial wetlands created at these sites are small and localized at the point of the leak. If leaks have been occurring for long periods of time they will likely encompass larger areas of land. Therefore, these features are unlikely to have been a wetland five years ago. Upon notification of the leaking water line, repairs were initiated and completed by OEHI and the condition of the sites will return to normal in a few weeks or months. The USACE has determined that artificially irrigated areas are jurisdictional wetlands; these cases have involved large pasture areas, where the USACE was uncertain as to the existence of natural wetlands occurring in the area that may be masked by irrigation practices. In these cases the USACE has taken the position that if the irrigation ceases, the USACE would revisit the site in two years to determine if any previously masked wetlands exist. However, given the otherwise very dry nature of the Project area, a direct link is easy to identify implicating the artificial water source as the cause of the mapped wetlands. Therefore, it would seem that the USACE would likely dismiss these areas as non-jurisdictional.

The lack of any indicators, including hydrophytic vegetation, wetland hydrology, or hydric soils within the proposed Project area, indicates that a USACE jurisdictional wetland is not present. However, the CDFW may choose to require notification and/or preparation of a Lake and Streambed Alteration Agreement pursuant to Section 1602 of the Fish and Wildlife Regulations. CDFW jurisdiction would include the area from bank to bank. Because the CDFW does not discriminate between ephemeral washes or streams, any drainage with a definable bed and bank (such as the ephemeral drainages in question), and presence of fish or wildlife resources can be considered jurisdictional by CDFW. While no aquatic wildlife is believed to occur within the drainages, multiple small mammal burrows were observed within the channel bed and banks which may provide habitat for sensitive terrestrial species. All findings by Stantec personnel are subject to final approval by CDFW personnel.

In conclusion – and recognizing that only the USACE can make a jurisdictional determination – no jurisdictional waters are believed to occur within the Project area, due to the apparent isolation of the Elk Hills drainages from known Waters of the U.S., the absence of hydrologic connectivity of individual fragments of these drainages, the questionable status of the artificial wetlands following the repair of the leaking water delivery pipelines, and the lack of any apparent significant nexus between these wetlands and a distant Waters of the U.S.

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APPENDIX A

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Table of Mapped Waters of the U.S.

CARBON DIOXIDE ENHANCED OIL RECOVERY PROJECT

Mapped Waters of the U.S. Features

Feature/ I.D.	Source of Hydrology	"Significant Nexus" Presence/Absence	Description of the Mapped Feature	Map Sheet Reference
Ephemeral Drainage/ ED-1	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 5
Ephemeral Drainage/ ED-2	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 5

Ephemeral Drainage/ ED-3	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 6
Ephemeral Drainage/ ED-4	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 4
Ephemeral Drainage/ ED-5	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 4
Ephemeral Drainage/ ED-6	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only	Map Sheet 3

			during heavy precipitation events during the rainy season.	
Ephemeral Drainage/ ED-7	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 3
Ephemeral Drainage/ ED-8	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 3
Ephemeral Drainage/ ED-9	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2

Ephemeral Drainage/ ED-10	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-11	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-12	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-13	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only	Map Sheet 2

			during heavy precipitation events during the rainy season.	
Ephemeral Drainage/ ED-14	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-15	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-16	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2

Ephemeral Drainage/ ED-17	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-18	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 2
Ephemeral Drainage/ ED-19	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 1
Ephemeral Drainage/ ED-20	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only	Map Sheet 1

			during heavy precipitation events during the rainy season.	
Ephemeral Drainage/ ED-21	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 1
Ephemeral Drainage/ ED-22	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Low-gradient feature; presence of bed and bank; intermittent scour. Coarse sandy substrates supporting upland vegetation. Supports surface flows only during heavy precipitation events during the rainy season.	Map Sheet 1
Gully/G-1	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2

Gully/G-2	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2
Gully/G-3	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2
Gully/G-4	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2
Gully/G-5	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2

Gully/G-6	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2
Gully/G-7	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 2
Gully/G-8	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 1
Gully/G-9	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 1
Gully/G-10	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour;	Map Sheet 1

			deeply incised channel.	
Gully/G-11	Direct precipitation; sheetflow runoff from surrounding uplands.	**Absent**: "Other Waters" feature does not exhibit continuous hydrologic connectivity and is hydrologically isolated from "Waters of the U.S." within the general region.	Medium to high-gradient erosional feature associated with sheetflow runoff from nearby well pad(s) and surrounding uplands. Pronounced scour; deeply incised channel.	Map Sheet 1
Artificial Wetland/AW-1	Direct precipitation; sheetflow runoff; leaking water delivery pipe.	**Absent**: Wetland feature is hydrologically isolated from "Waters of the U.S." within the general region; does not exhibit a "significant nexus" to a Traditional Navigable Water (TNW).	Prevalence of hydrophytic vegetation; presence of hydric soil indicators; presence of hydrologic indicators.	Map Sheet 1
Artificial Wetland/AW-2	Direct precipitation; sheetflow runoff; leaking water delivery pipe.	**Absent**: Wetland feature is hydrologically isolated from "Waters of the U.S." within the general region; does not exhibit a "significant nexus" to a Traditional Navigable Water (TNW).	Prevalence of hydrophytic vegetation; presence of hydric soil indicators; presence of hydrologic indicators.	Map Sheet 1
Artificial Wetland/AW-3	Direct precipitation; sheetflow runoff; leaking water delivery pipe.	**Absent**: Wetland feature is hydrologically isolated from "Waters of the U.S." within the general region; does not exhibit a "significant nexus" to a Traditional Navigable Water (TNW).	Prevalence of hydrophytic vegetation; presence of hydric soil indicators; presence of hydrologic indicators.	Map Sheet 1

APPENDIX B

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Vascular Plants of the Project Area

Project:	OEHI CO_2 EOR Project
	Kern County, California
Date:	5/29 - 5/31/2013
Field Delineators:	Christopher Bronny; Tommy Fardig

Wetland Indicator Status reflects updated 2012 National Wetland Plant List (NWPL) for Arid West (AW)

Nomenclature follows The Jepson Manual, 2nd Ed., 2012

*denotes naturalized species

Scientific Name	Common Name	Wetland Indicator Status
Section - Eudicots		
Asteraceae		
Ambrosia salsola	Cheesebush	
Aster(*chilensis*)	Aster	
*Centaurea melitensis**	Tocalote	
*Centaurea solstitialis**	Yellow star-thistle	
Corethrogyne (*filaginifolia*)	California sand-aster	
Erigeron canadensis	Common horseweed	**FACU**
Gutierrezia california	California matchweed	
Heterotheca grandiflora	Telegraph-weed	
Isocoma acradenia	Alkali goldenbush	**FACU**
*Lactuca serriola**	Prickly lettuce	**FACU**
Laennecia coulteri	Coulter's horseweed	**FAC**
Lessingia glandulifera var. *glandulifera*	Valley lessingia	
*Pseudognaphalium luteoalbum**	Jersey cudweed	**FAC**
*Sonchus oleraceus**	Common sow-thistle	
Stephanomeria pauciflora	Wire lettuce	
Boraginaceae		
Amsinckia sp.	Fiddleneck	
Phacelia sp.	Phacelia	
Plagiobothrys sp.	Popcornflower	
Brassicaceae		
Caulanthus lasiophyllus	California mustard	
*Hirschfeldia incana**	Short-pod mustard	

Lepidium nitidum	Shining pepperweed	**FAC**
Chenopodiaceae		
Atriplex polycarpa	Allscale saltbush	**FACU**
*Salsola tragus**	Russianthistle	**FACU**
Cleomaceae		
Isomeris arborea	Bladder pod	
Cucurbitaceae		
Cucurbita palmata	Coyote melon	
Crassulaceae		
Crassula connata	Sand pygmyweed	**FAC**
Euphorbiaceae		
Chamaesyce albomarginata	Rattlesnake weed	
Croton setiger	Turkey mullein	
Fabaceae		
Astragalus lentiginosus var. *nigricalycis*	Freckled milkvetch	
Geraniaceae		
*Erodium cicutarium**	Red-stem filaree	
Lamiaceae		
*Marrubium vulgare**	White horehound	**FACU**
Trichostema ovatum	San Joaquin bluecurls	
Loasaceae		
Mentzelia sp.	Mentzelia	
Malvaceae		
*Malva parviflora**	Cheeseweed	
Onagraceae		
Eremothera boothii ssp. *boothii*	Booth's evening-primrose	
Ranunculaceae		

Delphinium (*gypsophilum*)	Larkspur	
Salicaceae		
Salix gooddingii	Black willow	**FACW**
Solanaceae		
Datura wrightii	Jimson weed	
*Nicotiana glauca**	Tree-tobacco	**FAC**
Tamaricaceae		
*Tamarix ramosissima**	Saltcedar	

Section - Monocots

Poaceae		
*Avena fatua**	Wild oat	
*Bromus diandrus**	Rip-gut brome	
Bromus madrietensis ssp. *rubens**	Red brome	**UPL**
*Festuca myuros**	Rattail fescue	**FACU**
Hordeum (*marinum* ssp. *gussoneanum)**	Mediterranean barley	**FAC**
Poa (*secunda*)	Bluegrass	**FACU**
*Polypogon monspeliensis**	Rabbit's-foot grass	**FACW**
*Schismus barbatus**	Schimus grass	
Stipa sp.	Needlegrass	
Typhaceae		
Typha angustifolia	Narrow-leaved cattail	**OBL**

Wetland Plant Indicator Status Categories

Indicator Category	Symbol	Ecological Description
Obligate Wetland Plant	OBL	Almost always occur in wetlands.
Facultative Wetland Plant	FACW	Usually occur in wetlands, but may occur in non-wetlands.
Facultative Plant	FAC	Occur in wetlands and non-wetlands.
Facultative Upland Plant	FACU	Usually occur in non-wetlands, but may occur in wetlands.
Upland Plant	UPL	Almost never occur in wetlands.

*Based upon revised information contained in Army Corps of Engineers 2012 The National Wetland Plant List Indicator Rating Definitions (ERDC/CRREL TR-12-11)

APPENDIX C

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Photographs of the Project Area

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

DP 1

Representative photograph showing the location of DP 1, facing east. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern).

ED 2 (As Designated in Appendix E)

Representative photograph showing the location of ED 2, facing northeast. This ephemeral drainage has a defined bed and bank and a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern). An Arid West Ephemeral and OHWM Datasheet for the feature ED 2 can be found in Appendix E.

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

DP 2

Representative photograph showing the location of DP 2, northeast. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern).

DP 3

Representative photograph showing the location of DP 3, facing northeast. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern).

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

ED 3 (As Designated in Appendix E)

Representative photograph showing the location of ED 3, facing northeast. This ephemeral drainage has a defined bed and bank and a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern). An Arid West Ephemeral and OHWM Datasheet for the feature ED 3 can be found in Appendix E.

DP 4

Representative photograph showing the location of DP 4, facing southwest. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern).

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

DP 5

Representative photograph showing the location of DP 5, facing southwest. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern). Feature intercepts sheetflow run off from surrounding uplands and culvert underneath main access road.

DP 6

Representative photograph showing the location of DP 6, facing north. This low-gradient swale has a complete absence of hydrophytic vegetation, absence of hydric soil indicators, and a single secondary hydrologic indicator (i.e., drainage pattern).

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

ED 4 (As Designated in Appendix E)

Representative photograph showing the location of ED 4, facing southwest. This ephemeral drainage has a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern) and has a narrowly defined bed and bank. An Arid West Ephemeral and OHWM Datasheet for the feature ED 4 can be found in Appendix E.

Representative Gully

Representative photograph showing a shallow gully, facing southwest. This moderately steep gradient gully has a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern). Erosional head cutting at top of feature.

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

Representative Gully

Representative photograph showing a gully representative of the features mapped within the project area, facing east. This moderately steep gradient gully has a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern). Erosional head cutting at top of feature.

Representative Ephemeral Drainage

Representative photograph showing the location of a shallow ephemeral drainage, facing east. This ephemeral drainage has a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern) and has a defined bed and bank.

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

Representative Gully

Representative photograph showing the location of a typical gully, facing south. This moderate gradient gully has a complete absence of hydrophytic vegetation and absence of hydric soil indicators. It contains a single secondary hydrologic indicator (i.e., drainage pattern).

Artificial Wetland

Photograph showing the location of an Artificial wetland, facing northwest. This artificial wetland created by a leaking water pipe has the presence of hydric soil indicators and hydrophytic vegetation.

STANTEC CONSULTING CORPORATION
PHOTOGRAPHIC RECORD

Client: Occidental of Elk Hills, Inc.	**Job Number:** 185802314
Site Name: HECA CO_2 Supply Line Alignment	**Photographer:** T. Fardig

DP 150 (Artificial Wetland)

Representative photograph showing the location of DP 150, facing southeast. This feature is an artificial wetland induced by leaky water pipes. Upland and wetland data points (DP150a and DP150b) were taken to determine existing conditions along the mapped boundary; the orange fieldbook marks the upland position and the shovel (left-center of photograph) marks the location of the wetland test pit.

DP 150 (Artificial Wetland)

Representative photograph showing the location of DP 150, facing east. This feature is an artificial wetland induced by leaky water pipes. Upland and wetland data points (DP150c and DP150d) were taken to determine existing conditions along the mapped boundary; the Munsell field book marks the upland position and the shovel marks the location of the wetland test pit.

APPENDIX D

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Soils of the Project Area

Kern County, California, Northwestern Part

126—Cajon loamy sand, 2 to 5 percent slopes

Map Unit Setting

Elevation: 200 to 4,000 feet
Mean annual precipitation: 4 to 9 inches
Mean annual air temperature: 63 to 70 degrees F
Frost-free period: 250 to 300 days

Map Unit Composition

Cajon and similar soils: 85 percent
Minor components: 15 percent

Description of Cajon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Available water capacity: Moderate (about 6.9 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: SANDY (R017XG030CA)

Typical profile

0 to 9 inches: Loamy sand
9 to 44 inches: Sand, fine sand
44 to 60 inches: Stratified sand to loamy fine sand

Minor Components

Kimberlina

Percent of map unit: 5 percent

Kimberlina gravelly sandy loam

Percent of map unit: 5 percent

Wasco

Percent of map unit: 5 percent

Data Source Information

Soil Survey Area: Kern County, California, Northwestern Part
Survey Area Data: Version 5, Jul 22, 2008

Kern County, California, Northwestern Part

146—Elkhills sandy loam, 9 to 50 percent slopes, eroded

Map Unit Setting

Elevation: 400 to 1,600 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 240 to 300 days

Map Unit Composition

Elkhills and similar soils: 85 percent
Minor components: 15 percent

Description of Elkhills

Setting

Landform: Erosion remnants on terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from igneous and sedimentary rock

Properties and qualities

Slope: 9 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 8.0 mmhos/cm)
Available water capacity: Moderate (about 6.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy 6-8" P.Z. (R017XG043CA)

Typical profile

0 to 29 inches: Gravelly sandy loam
29 to 49 inches: Gravelly sandy loam
49 to 65 inches: Stratified gravelly sand to silt loam

Minor Components

Torriorthents, stratified

Percent of map unit: 5 percent

Very sandy soils
Percent of map unit: 5 percent

Unnamed, finer textured underlying material
Percent of map unit: 5 percent

Data Source Information

Soil Survey Area: Kern County, California, Northwestern Part
Survey Area Data: Version 5, Jul 22, 2008

Kern County, California, Northwestern Part

232—Torriorthents stratified, eroded-Elkhills complex, 9 to 50 percent slopes

Map Unit Setting

Landscape: Valleys
Elevation: 400 to 3,500 feet
Mean annual precipitation: 6 to 8 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 240 to 300 days

Map Unit Composition

Torriorthents, stratified, eroded, and similar soils: 50 percent
Elkhills and similar soils: 30 percent
Minor components: 20 percent

Description of Torriorthents, Stratified, Eroded

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium derived from mixed and/or lacustrine deposits

Properties and qualities

Slope: 9 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 3 percent
Maximum salinity: Slightly saline to moderately saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 50.0
Available water capacity: Low (about 5.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7e
Hydrologic Soil Group: C

Typical profile

0 to 4 inches: Sandy loam
4 to 54 inches: Stratified sand to silty clay loam
54 to 60 inches: Stratified clay loam to clay

Description of Elkhills

Setting

Landform: Fan remnants
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed and/or lacustrine deposits

Properties and qualities

Slope: 9 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (0.0 to 8.0 mmhos/cm)
Available water capacity: Moderate (about 6.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: Loamy 6-8" P.Z. (R017XG043CA)

Typical profile

0 to 29 inches: Gravelly sandy loam
29 to 49 inches: Coarse sandy loam
49 to 65 inches: Stratified sand to gravelly silt loam

Minor Components

Unnamed, severely eroded

Percent of map unit: 12 percent
Landform: Fan remnants, hills

Unnamed, hardpan

Percent of map unit: 4 percent
Landform: Fan remnants, hills

Unnamed, sandy

Percent of map unit: 4 percent
Landform: Fan remnants, drainageways
Landform position (two-dimensional): Summit

Data Source Information

Soil Survey Area: Kern County, California, Northwestern Part
Survey Area Data: Version 5, Jul 22, 2008

APPENDIX E

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Arid West Ephemeral / Intermittent Streams OHWM Datasheet

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Oxy HECA Supply Line
Project Number:
Stream: Unnamed ephemeral drainage
Investigator(s): Chris Bronny; Tom Fardig

Date: 5/30/13 **Time:** 7:45 AM.
Town: Tupman **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: Corresponds with mapped Feature ED-2

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:
Pipeline construction/grading

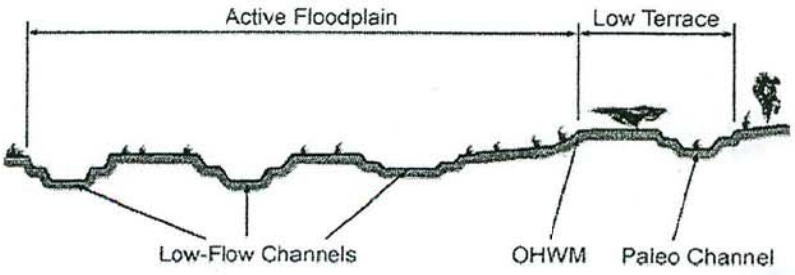
Brief site description:
Low-gradient feature w/ ephemeral drainage that is linear throughout - some portions may have become impacted by past road grading. No hydrophytic veg in channel. Greater Watershed Drainage Pattern towards CA Aqueduct

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [ ] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [ ] Digitized on computer
   - [X] GPS
   - [ ] Other:

Project ID: **Cross section ID:** ED-2 **Date:** 5/30/13 **Time:** 7:55 AM

Cross section drawing:

OHWM

GPS point: Live Feature

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☒ Other: Thalweg
- ☐ Other: _____

Comments:

Thalweg sparsely vegetated; Coarse alluvium in bed

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Oxy HECA Supply Line
Project Number:
Stream: Unnamed Ephemeral Drainage
Investigator(s): Bromm, Fardig

Date: 5/30/13 **Time:** 9:45 AM
Town: Tupman **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details: Corresponds with mapped Feature ED-3

Projection: **Datum:**
Coordinates:

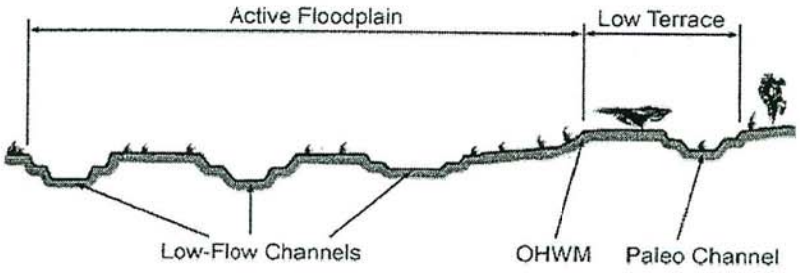
Potential anthropogenic influences on the channel system:
Pipeline alignment / grading / fill

Brief site description:
Ephemeral Feature has a bed/bank + drainage pattern, but historic hydrologic connectivity is now truncated by CA Aqueduct. OHWM + Top of Bank mapped with GPS technology

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [ ] Geologic maps
- [ ] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [ ] Mapping on aerial photograph
   - [X] GPS
   - [ ] Digitized on computer
   - [ ] Other:

Project ID: **Cross section ID:** ED3 **Date:** 5/30/2013 **Time:** 10:50AM

Cross section drawing:

OHWM

GPS point: Polygon

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments: Bromus Madritensis and Avena fatua major dominate within grassy channel – some periodic scour.

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Oxy HECA Supply Line
Project Number:
Stream: Unnamed Ephemeral Drainage
Investigator(s): Brown, Fowler

Date: 5/30/13
Town: Tupman
Photo begin file#:

Time: 1:30 PM
State: CA
Photo end file#:

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Corresponds with Mapped Feature ED4

Projection: **Datum:**
Coordinates:

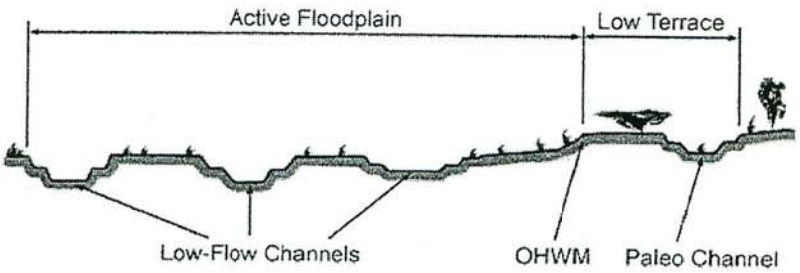
Potential anthropogenic influences on the channel system:
Pipeline Construction, Grading/Fill

Brief site description:
Unnamed Ephemeral Drainage System
Low-gradient – sparsely vegetated sandy gravel bed; Banks somewhat intermittent in some portions

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☐ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

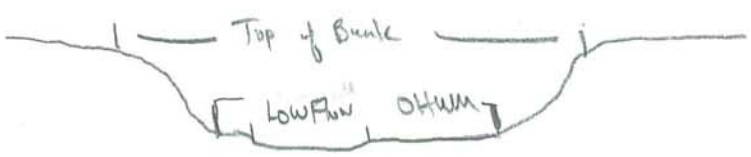


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☐ Digitized on computer
   - ☒ GPS
   - ☐ Other:

Project ID: **Cross section ID:** ED4 **Date:** 5/30/13 **Time:** 1:35PM.

Cross section drawing:



OHWM

GPS point: Line Features

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments: Upland vegetation in Thalweg; some chenopod shrubs present along bank

Floodplain unit: ☒ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: Line Features

Characteristics of the floodplain unit:

Average sediment texture: gravel/sands

Total veg cover: 60 % Tree: Ø % Shrub: 30 % Herb: 30 %

Community successional stage:

- ☐ NA
- ☒ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☒ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: HECA CO_2 Supply Line Alignment
Project Number:
Stream: Unnamed Ephemeral Drainage
Investigator(s): Chris Brown; Tommy Fardig

Date: 5/31/2013 **Time:** 11:45AM
Town: Tupman **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Corresponds with HECA Figure; DP 154

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system:
Proposed Pipeline Alignment Project; normal cut/fill grading activities associated with Oil Production Infrastructure.

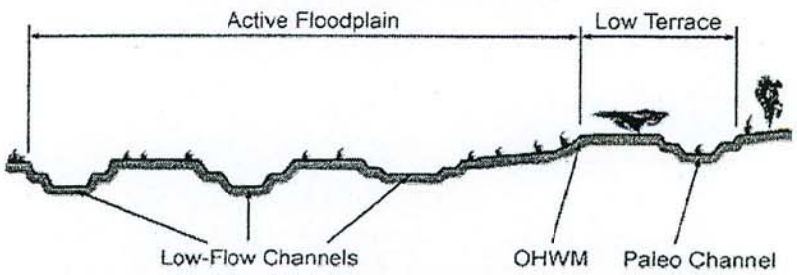
Brief site description:
Sample area located in low-gradient ephemeral drainage that is hydrologically supported by a number of non-jurisdictional swales. Mapped feature is truncated downslope. Intermittent scour along bed; bed and bank fairly well defined in this reach.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ GPS
   - ☐ Digitized on computer
   - ☐ Other:

Project ID: **Cross section ID:** DP154 **Date:** 5/31/2013 **Time:** 11:50 AM

Cross section drawing:

Approx. 3' in width in sample area location

OHWM

GPS point: Polygon

Indicators:

- [X] Change in average sediment texture
- [ ] Change in vegetation species
- [X] Change in vegetation cover
- [X] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Thalweg of channel sparsely vegetated by uplak species – primarily Bromus madritensis, Gutierrezia californica, + Atriplex polycarpa Sediments coarse sands at small gravel.

Floodplain unit: [X] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: Polygon

Characteristics of the floodplain unit:

Average sediment texture: Coarse Sands

Total veg cover: 40 % Tree: ____ % Shrub: 30 % Herb: 10 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [X] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [X] Presence of bed and bank
- [ ] Benches
- [X] Soil development
- [X] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: HECA CO_2 Supply line Alignment
Project Number:
Stream: Unnamed Ephemeral Drainage
Investigator(s): Chris Bronny; Tommy Fardig

Date: 5/30/2013 **Time:** 9:30 AM.
Town: Tupman **State:** CA
Photo begin file#: **Photo end file#:**

Y ☒ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details: Corresponds with HECA Figure; DP 155

Projection: **Datum:**
Coordinates:

Potential anthropogenic influences on the channel system: Proposed Pipeline Alignment Project; normal cut/fill grading activities associated with oil production infrastructure.

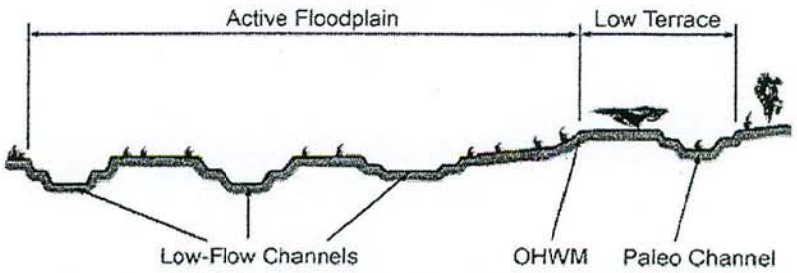
Brief site description: Sample area located in low-gradient ephemeral drainage that is hydrologically supported by a number of micro watershed, non-jurisdictional swales. Mapped feature is truncated downslope. Intermittent scour along bed; bed and bank fairly well-defined in this reach.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☐ Geologic maps
- ☐ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies

- ☐ Stream gage data
  Gage number:
  Period of record:
  - ☐ History of recent effective discharges
  - ☐ Results of flood frequency analysis
  - ☐ Most recent shift-adjusted rating
  - ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

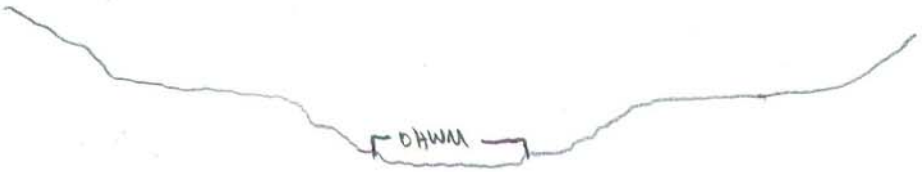


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☐ Mapping on aerial photograph
   - ☒ GPS
   - ☐ Digitized on computer
   - ☐ Other:

Project ID: **Cross section ID:** DP155 **Date:** 5/30/13 **Time:** 9:45AM.

Cross section drawing:



OHWM

GPS point: Polygon/lines

Indicators:

- [x] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Thalweg of channel sparsely vegetated by upland species - primarily Bromus madritensis, Amsinckia sp., Schismus barbatus, Gutierrezia Californica, at Atriplex polycarpa. Channel sediments Coarse sands/small gravel

Floodplain unit:

- [ ] Low-Flow Channel
- [ ] Active Floodplain
- [ ] Low Terrace

GPS point: Polygon/ lines

Characteristics of the floodplain unit:

Average sediment texture: Coarse sand

Total veg cover: 30 % Tree: ____ % Shrub: 25 % Herb: 5 %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [x] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [x] Presence of bed and bank
- [ ] Benches
- [x] Soil development
- [x] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

APPENDIX F

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Wetland Determination Data Forms And Arid West Region

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP1

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	40	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____		= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 60		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 60% cover; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15"	7.5YR4/4	100					Silty clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; nearly pure sand below 2" of surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/30/13

Applicant/Owner: OEHI State: CA Sampling Point: DP2

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒		
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	20	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. *Schismus barbatus*	55	yes	UPL
4. *Lessingia glandulifera*	1	no	UPL
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____		= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 25		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 25% cover; Lessingia and Amsinckia <1% cover. Prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-0.5"	10YR3/1	100					Sandy clay	
0.5-2"	7.5YR5/4	100					Sandy clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; nearly pure sand below 2". Dark band extends 0.5" below surface; some organic matter present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/30/13

Applicant/Owner: OEHI State: CA Sampling Point: DP3

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	70	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____	70	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 30		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 30% cover; Amsinckia <1% cover. Prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	7.5YR4/4	100					Clayey sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; small amount of organic matter present within top 0.5" of soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP4

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	60	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____		= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 60		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 60% cover; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18"	7.5YR4/4	100					Silty clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP5

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	30	yes	UPL
2. *Amsinckia sp.*	5	no	UPL
3. *Schismus barbatus*	20		
4. *Erodiumcicutarium*	5		
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____		= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 40		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 40% cover; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12"	7.5YR4/4	100					Silty clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/30/13

Applicant/Owner: OEHI State: CA Sampling Point: DP6

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRR C Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale. Historic Elk Hills drainages now truncated by CA Aqueduct; do not exhibit hydrologic connectivity to greater "waters of the U.S." All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	2	no	UPL
2. *Schismus barbatus*	20	yes	UPL
3. *Erodium cicutarium*	10	yes	UPL
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____	32	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 68	% Cover of Biotic Crust _____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground = 68% cover. Prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9"	7.5YR4/4	100					Silty sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 150a

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): LRRC Lat: 35.2838120° Long: -119.3827321° Datum:

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Atriplex polycarpa*	5	no	UPL
2.			
3.			
4.			
5.			
50% = , 20% =	5	= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus madritensis*	15	yes	UPL
2. *Schimus barbatus.*	3	no	UPL
3.			
4.			
5.			
6.			
7.			
8.			
50% = , 20% =	18	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	
% Bare Ground in Herb Stratum 77	% Cover of Biotic Crust		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 77% cover; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 150a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8"	10YR4/4	100						

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Absence of hydrologic indicators and wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 150b

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Artificial Wetland Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRRC Lat: 35.2838120° Long: -119.3827321° Datum: _____

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☒, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix gooddingii*	20	yes	FACW
2. *Tamarix ramosissima*	10	yes	-
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	30	= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	5	no	UPL
2. *Laennecia coulteri*	15	yes	FAC
3. *Typha angustifolia*	4	no	OBL
4. *Erigeron canadensis*	10	no	FACU
5. *Polypogon monspeliensis*	5	no	FACW
6. *Aster (chilensis)*	5	no	UPL
7. *Lactuca serriola*	1	no	FACU
8. _____	_____	_____	_____
50% = _____, 20% = _____	45	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 25 % Cover of Biotic Crust _____

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Bare ground/open water = 25% cover; overall dominance exhibited by hydrophytic species.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 150b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5"	10YR5/4	100					Sandy clay	
5-15"	GLEY2.5/5BG	60					Sandy muck	
5-15"	10YR5/4	40					Sandy clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: 0

Depth (Inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Presence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches):	7"
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	Surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Indicators of wetland hydrology are present; however, feature is hydrologically isolated and does not exhibit a significant nexus to a TNW.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 150c

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Upland Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRRC Lat: 35.2838120° Long: -119.3827321° Datum: _____

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. *Atriplex polycarpa*	10	no	UPL
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = _____, 20% = _____	10	= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	40	yes	UPL
2. *Schimus barbatus.*	10	yes	UPL
3. *Laennecia coulteri*	8	no	FAC
4. *Lactucus serriola*	5	no	FAC
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
50% = _____, 20% = _____	63	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	73	= Total Cover	
% Bare Ground in Herb Stratum 27	% Cover of Biotic Crust _____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 27% cover.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 150c

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR5/4	100					Silty clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Absence of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 150d

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Artificial Wetland Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRRC Lat: 35.2838120° Long: -119.3827321° Datum: _____

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

Are Vegetation ☒, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	☒	No	☐	
Hydric Soil Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?** **Yes** ☒ **No** ☐
Wetland Hydrology Present?	Yes	☒	No	☐	

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. Mapped wetland features created in uplands by leaky water pipes. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. *Atriplex polycarpha*	5	no	UPL
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____	5	= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	10	no	UPL
2. *Laennecia coulteri*	30	yes	FAC
3. *Aster (chilensis)*	3	no	UPL
4. *Sonchus oleraceus*	10	no	UPL
5. *Psuedognaphalium luteoalbum*	20	no	FAC
6. *Typha angustifolia*	5	no	OBL
7. *Erigeron canadensis*	5	no	FACU
8. _____			
50% = _____, 20% = _____	83	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____	88	= Total Cover	
% Bare Ground in Herb Stratum 12		% Cover of Biotic Crust _____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: Bare ground/open water = 12% cover.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 150d

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-0.5"	7.5YR4/4	100					Sandy clay	
0.5-9"	Pure sand	99					Course	
	2.5YR4/6	1					Sandy clay	Sand, tiny amount of clay

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☒ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☒ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☒ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☒ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches): "

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks: Thin, approximately 0.5 " dark muck layer present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☒ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☒ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☒ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☒ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☒	No	☐	Depth (inches):	0.5"
Water Table Present?	Yes	☐	No	☒	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	Surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Indicators of wetland hydrology are present; however, feature is hydrologically isolated and does not exhibit a significant nexus to a TNW.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/31/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 151

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 22S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Shallow Basin Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRRC Lat: 35.3088337° Long: -119.3811208° Datum: _____

Soil Map Unit Name: Cajon Loamy sand, 2 to 5 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐		
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Feature embedded in low-gradient swale; Feature is extremely shallow basin that intercepts sheetflow runoff form surronding uplands. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1.			
2.			
3.			
4.			
5.			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Hordeum marinum*	60	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50% = _____, 20% = _____	60	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1.			
2.			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 40	% Cover of Biotic Crust	_____	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**100%**	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Bare ground/thatch = 40% cover; prevalence of upland species surrounding mapped feature.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 151

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
8-11"	10YR4/4	100					Silty clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; no redox.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☒ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☒ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single primary and single secondary hydrologic indicators. Feature is "flashy" and appears to pond water for short hydroperiods during the rainy season.Historic drainage pattern within the greater area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 152

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 22S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRRC Lat: 35.3052374° Long: -119.3769344° Datum: _____

Soil Map Unit Name: Cajon Loamy sand, 2 to 5 percent slopes NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Single descriptive waypoint taken in low-gradient swale that transitions to deeply incised gully. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____		= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Bromus madritensis*	30	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. *Bromus diandrus*	60	yes	UPL
4. *Croton setiger*	10	no	UPL
5. *Cucurbita sp.*	3	no	UPL
6. *Trichostema ovatum*	1	no	UPL
7. _____			
8. _____			
50% = _____, 20% = _____	100 %	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 0	% Cover of Biotic Crust _____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 60% cover; prevalence of upland species within sample area. Croton setiger = residual dry matter from previous season's growth.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 152

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7"	10YR4/4	100					Silty clay	Gravel inclusions

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): ____
Water Table Present?	Yes	☐	No	☒	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): ____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology. Historic drainage pattern within the greater area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 153

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRRC Lat: 35.2915578° Long: 119.3790584° Datum:

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
50% = , 20% =		= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus madritensis*	35	yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50% = , 20% =	35	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	
% Bare Ground in Herb Stratum 65	% Cover of Biotic Crust		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0%	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 65% cover.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 153

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]		
0-2"	10YR4/6	100					Sandy silt	High sand percentage; some clays present
2-9"	Sand	100					Sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): "

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; nearly pure sand below 2" of surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology. Historic drainage patterns within the greater Elk Hills area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/31/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 154

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Ephemeral Drainage Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRRC Lat: 35.2943199° Long: -119.3772882° Datum: _____

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:_____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
50% = _____, 20% = _____		= Total Cover	
Sapling/Shrub Stratum (Plot size:_____)			
1. *Atriplex polycarpa*	5	no	UPL
2. _____			
3. _____			
4. _____			
5. _____			
50% = _____, 20% = _____	5	= Total Cover	
Herb Stratum (Plot size:_____)			
1. *Bromus madritensis*	55	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
50% = _____, 20% = _____	55	= Total Cover	
Woody Vine Stratum (Plot size:_____)			
1. _____			
2. _____			
50% = _____, 20% = _____		= Total Cover	
% Bare Ground in Herb Stratum 40	% Cover of Biotic Crust _____		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **0** (A/B)

Prevalence Index worksheet:

Total % Cover of :	Multiply by:
OBL species _____	x1 = _____
FACW species _____	x2 = _____
FAC species _____	x3 = _____
FACU species _____	x4 = _____
UPL species _____	x5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 60% cover; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 154

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9"	7.5YR4/4	100					Sandy clay	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; No redox. Presence of hydrocarbon residues mixed in soil profile.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):
Water Table Present?	Yes	☐	No	☒	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; does not meet hydrologic criteria. Historic drainage patterns within the greater Elk Hills area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 155

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Ephemeral Drainage Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRRC Lat: 35.2900899° Long: 119.3805821° Datum:

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Gutierrezia californica*	5	no	UPL
2.			
3.			
4.			
5.			
50% = , 20% =	5	= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus madritensis*	3	no	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
50% = , 20% =	3	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	

% Bare Ground in Herb Stratum 92 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	0	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species	8	x5 =	40
Column Totals:	8 (A)		40 (B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: Bare ground/thatch = 60% cover; Prevalence Index > 3.0

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 155

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2"	10YR 5/6	100					Silty clay	Nearly pure sand below 2"
2-10"	Sand	100					Sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (Inches): ____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; nearly pure sand below 2" of surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology; does not meet hydrologic criteria. Historic drainage patterns within the greater Elk Hills area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 156

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRRC Lat: 35.2837232° Long: 119.3813534° Datum:

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Atriplex polycarpa*	20	yes	UPL
2.			
3.			
4.			
5.			
50% = , 20% =	20	= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus madritensis*	35	yes	UPL
2. *Amsinckia sp.*	1	no	UPL
3.			
4.			
5.			
6.			
7.			
8.			
50% = , 20% =	36	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	

% Bare Ground in Herb Stratum 44 % Cover of Biotic Crust

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	0	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	**0%**	(A/B)

Prevalence Index worksheet:

Total % Cover of :		Multiply by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Bare ground/thatch = 44% cover; prevalence of upland species within sample area. Absence of hydrophyta.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 156

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-15"	7.5YR5/6	100					Clayey silt	Some sand throughout pedon

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (Inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; No redox..

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): ____

Water Table Present? Yes ☐ No ☒ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): ____

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology. Historic drainage patterns within the greater Elk Hills area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

WETLAND DETERMINATION DATA FORM – Arid West Region

Project Site: HECA Carbon Dioxide Supply Line Alignment City/County: /Kern Sampling Date: 5/29/13

Applicant/Owner: OEHI State: CA Sampling Point: DP 157

Investigator(s): Chris Bronny; Tommy Fardig Section, Township, Range: Section 27S, Township 30S, Range 24E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRRC Lat: 35.2874704° Long: 119.3813995° Datum:

Soil Map Unit Name: Elkhills sandy loam, 9 to 50 percent slopes, eroded. NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☐ No ☒ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☒, or Hydrology ☒ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☒, or Hydrology ☒ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒		
Hydric Soil Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **East/northern side of historic Elk Hills drainages now truncated by CA Aqueduct and do not exhibit hydrologic connectivity to greater "waters of the U.S." within the region. All hillslope drainages have been altered by cut and fill activities and accelerated erosion associated with oil production practices; accreting sediments and hydrocarbon residues mask historic soils in low- and moderate gradient swales. Precipitation below-average for 2012-2013 rainy season.**

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
50% = , 20% =		= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus madritensis*	1	no	UPL
2. *Amsinckia sp.*	1	no	UPL
3. *Schismus barbatus*	1	no	UPL
4.			
5.			
6.			
7.			
8.			
50% = , 20% =	3	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	
% Bare Ground in Herb Stratum 90	% Cover of Biotic Crust		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of :	Multiply by:
OBL species	x1 =
FACW species	x2 =
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks: Sparsley vegetated swale; prevalence of upland species within sample area.

Project Site: HECA Carbon Dioxide Supply Line Alignment

SOIL

Sampling Point: DP 157

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (Moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10"	Sand	100					Sand	

[1]Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:

Depth (Inches):

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Absence of hydric soil indicators; nearly pure sand. Presence of hydrocarbons mixed in the sand.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches):

Wetland Hydrology Present? **Yes** ☐ **No** ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Presence of single secondary hydrologic indicator; absence of wetland hydrology. Historic drainage patterns within the greater Elk Hills area has been truncated by the construction of the CA Aqueduct (i.e., absence of hydrologic connectivity to valley floor hydrogeomorphic systems).

APPENDIX G

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Delineation Digital Data Files

Refer to CD Included in Hard Copy

APPENDIX H

PRELIMINARY JURISDICTIONAL DELINEATION OF WATERS OF THE UNITED STATES OEHI CO_2 EOR PROJECT

Jurisdictional Delineation for the OEHI Carbon Dioxide Supply Line Alignment

Occidental of Elk Hills, Inc.
Technical Memorandum

Jurisdictional Delineation for OEHI Carbon Dioxide Supply Line Alignment

Prepared For: Occidental of Elk Hills, Inc.

Prepared By: Stantec Consulting

Date: June 3, 2013

INTRODUCTION

Hydrogen Energy California (HECA) is pursuing coverage under a U.S. Army Corps of Engineers (Corps) Nationwide Permit for construction of the HECA CO2 pipeline supplying the Occidental of Elk Hills, Inc. CO2 injection project. A delineation of wetlands and other waters in the HECA project study area was submitted to the Corps in early March as part of the Nationwide Permit review. OEHI has received comments from HECAstating that the Corps is requesting clarification of the delineation in several areas, including portions of the OEHI project area and requesting a response from HECA by June 7, 2013.

The attached Figure was provided by HECA and identifies the areas within the OEHI Project that require clarification. HECA is requesting information at each of the points indicated on this map (DP151-157) and a review of the drainage features shown on the map for potential ordinary high water mark indicators. Specifically, the the following information was requested for the sites identified on the map:

- **Type of feature (e.g. stream channel, artificial ditch, pond, etc…)**
- **Seven wetland data sheets (at DP151-157) that identifies the presence/absence of the three wetland parameters (soil, veg, and hydrology)**
- **Dimensions of channels**
- **Any evidence of Ordinary High Water (as defined by the Corps)**
- **Identification of any wetland vegetation**
- **Photos (to clarify these areas for the Corps)**

Stantec Consulting conducted a preliminary jurisdictional delineation of the areas identified in the Figure on May 29, 30, and 31, 2013. The field delineation was conducted for the purpose of identifying existing environmental conditions and the extent of Corps jurisdiction along the proposed pipeline alignment and proposed facility site. Visual observations as to the presence

or absence of indicators of wetland soil, vegetation and hydrological conditions were made during the investigation. The boundaries of all potential wetland/water features observed were further defined in accordance with the Corps regulations and the required methodology described in the 1987 Corps Wetlands Delineation Manual (1987 Manual), Arid West Supplement to the 1987 Manual (Arid West Supplement), and Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States (OHWM Supplement).

The complete results of our findings will be presented in the form of a draft jurisdictional delineation report that addresses the entire area of affect.

The following is the presentation of our findings regarding those eight sites. Exhibit A (attached) presents the eight site locations, descriptive, upland, and wetland GPS points, and insets showing the extent of potentially jurisdictional "other waters" of the U.S./state. Information recorded on Arid West and OHWM data forms can be viewed in Attachment A; corresponding photographs can be viewed in Attachment B.

DP151

Type of Feature: Shallow Basin

Arid West Data Form: Attachment A

Dimensions of Channels: N/A

Evidence of OHWM: N/A

Identification of Wetland Vegetation: Dominant hydrophytic species = *Hordeum marinum* (Mediterranean Barley; FAC) within sample test pit area/GPS-mapped boundary of feature.

Photographs: Attachment B

DP152

Type of Feature: Swale and Gully

Arid West Data Form: Attachment A

Dimensions of Channels: Three foot channel

Evidence of OHWM: Gully feature exhibits scour and deep incision within a defined bed and bank.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient swale.

Photographs: Attachment B

DP154

Type of Feature: Ephemeral Drainage

Arid West/OHWM Data Forms: Attachment A

Dimensions of Channels: 3 foot average width within sample area.

Evidence of OHWM: Intermittent scour; break in bank slope; change in average sediment texture.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient channel.

Photographs: Attachment B

DP153

Type of Feature: Swale

Arid West Data Form: Attachment A

Dimensions of Channels: N/A

Evidence of OHWM: Absence of a bed and bank.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient swale.

Photographs: Attachment B

DP155

Type of Feature: Ephemeral Drainage

Arid West/OHWM Data Forms: Attachment A

Dimensions of Channels: 6 foot average width within sample area.

Evidence of OHWM: Intermittent scour; break in bank slope; change in average sediment texture.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient channel.

Photographs: Attachment B

DP157

Type of Feature: Swale

Arid West Data Form: Attachment A

Dimensions of Channels: N/A

Evidence of OHWM: Absence of a bed and bank.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient swale.

Photographs: Attachment B

DP150

Type of Feature: Artificial Wetland

Arid West Data Form: Attachment A

Dimensions of Channels: Average width is between 12 and 15 feet, approximately 0.007 acres.

Evidence of OHWM: N/A

Identification of Wetland Vegetation: Hydrophytic vegetation observed within mapped feature included:

- *Laennecia coulteri* = FAC
- *Polypogon monspeliensis* = FACW
- *Salix gooddingii* = FACW
- *Typha angustifolia* = OBL

Photographs: Attachment B

DP156

Type of Feature: Swale

Arid West Data Form: Attachment A

Dimensions of Channels: N/A

Evidence of OHWM: Absence of a bed and bank.

Identification of Wetland Vegetation: Absence of hydrophytic vegetation within low-gradient swale.

4S
3S
2S
9S
10S
11S
16S
15S
22S
23S
California Aqueduct
DP151
DP152
DP155
DP154
DP153
DP157
DP150
DP156
50' Section
Width: 12.0 ft.
0.0295 ac.
50' Section
Width: 3 ft.
0.0159 ac.
DP150a
DP150b
0.00063 ac.
DP150d
DP150c
0.00632 ac.

- Hydrogen Energy California
- Shallow Basin
- Swale
- Ephemeral Drainage
- Gully
- Wetland
- Possible Waters of the US
- Water Resources/ Streams (USGS)
- OEHI Boundary
- Jurisdictional Delineation Survey Boundary (50 ft.)
- Data Points

Bluelines interpreted by the Environmental Science Research Institute for the USGS. Probable Waters of the US were derived from Google Maps (2013). Preliminary other waters data collected by Stantec Consulting (May 2013). Section numbering system; The Section Numbering System in the Western Areas that are within the Department of Energies Naval Petroleum Reserve No. 2 are in a Alpha Numeric format. The rest of Kern County is in the USGS Standard Sectioning Numering System.

0 0.2 0.4
Miles
0 0.25 0.5
Kilometers

Stantec

STANTEC CONSULTING SERVICES Inc.
4700 Stockdale Highway, Suite 125
Bakersfield, CA 93309
Phone: (661) 616-0000 Fax: (661) 616-2400

OCCIDENTAL OF ELK HILLS, INC.

HECA CO_2 SUPPLY LINE ALIGNMENT JURISDICTIONAL DELINEATION SURVEY

Date: 6/5/2013
Author: HS

Reference Scale
1:17,533

EXHIBIT A

Document Path: Z:_mxds\HECA_jurisdictional delineation_exhibit A.mxd

4S
3S
2S
9S
10S
11S
16S
15S
14S
DP151
DP152
22S
23S
DP154
DP153
DP155
27S
26S
DP157
DP150
DP156
35S

Hydrogen Energy California
Ephemeral Drainage
Gully
Wetland
Possible Waters of the US
Water Resources/ Streams (USGS)
OEHI Boundary
Jurisdictional Delineation Survey Boundary (50 ft.)
Data Points

Bluelines interpreted by the Environmental Science Research Institute for the USGS. Probable Waters of the US were derived from Google Maps (2013). Preliminary other waters data collected by Stantec Consulting (May 2013). Section numbering system; The Section Numbering System in the Western Areas that are within the Department of Energies Naval Petroleum Reserve No. 2 are in a Alpha Numeric format. The rest of Kern County is in the USGS Standard Sectioning Numering System.

0 0.2 0.4
Miles
0 0.25 0.5
Kilometers

X, Getmapping, Aerogrid, IGN,

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OCCIDENTAL OF ELK HILLS, INC.

PRELIMINARY MAPPED OTHER WATERS OF THE HECA CO_2 SUPPLY LINE ALIGNMENT PROJECT

Date: 6/4/2013
Author: HS

Reference Scale
1:17,533

EXHIBIT B

Document Path: Z:_mxds\HECA_jurisdictional delineation_exhibit B.mxd