

**WASTEWATER COLLECTION SYSTEM, PHASES 1 & 2
RESULTS OF SENSITIVE PLANT SURVEYS**



CITY OF TWENTYNINE PALMS, SAN BERNARDINO COUNTY, CALIFORNIA

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1.0 INTRODUCTION

Wood Environment & Infrastructure Solutions, Inc. (Wood) was contracted by Terra Nova Planning and Research to conduct a biological resources assessment at the site of Phases 1 and 2 of a proposed wastewater collection system project (project) in Twentynine Palms, San Bernardino County, California. The assessment (Wood 2022) identified twenty special status (sensitive) plant species which are known from the project area and at project elevations. Therefore, focused surveys were conducted for those species. The results of those surveys are presented here.

1.1 Project Location and Topography

The project is entirely within the City of Twentynine Palms, San Bernardino County, California (see Figure 1). It is located primarily on the 7.5-minute Twentynine Palms, Calif. United States Geological Survey (USGS) quadrangle extending slightly south into the Queen Mountain, Calif. USGS quadrangle. It is in Township 1 North, Range 9 East, in portions of Sections 15, 16, 20-22, 27-29, 32 and 33 (see Figure 2). Project topography is roughly level overall, with some low hills in the southwestern area. Elevations range from approximately 1,795 feet (547 meters) in the northeast to 2,140 feet (652 meters) in the southwest. The land within the study area generally slopes from the southwest to the northeast (NV5 2022).

1.2 Project Description

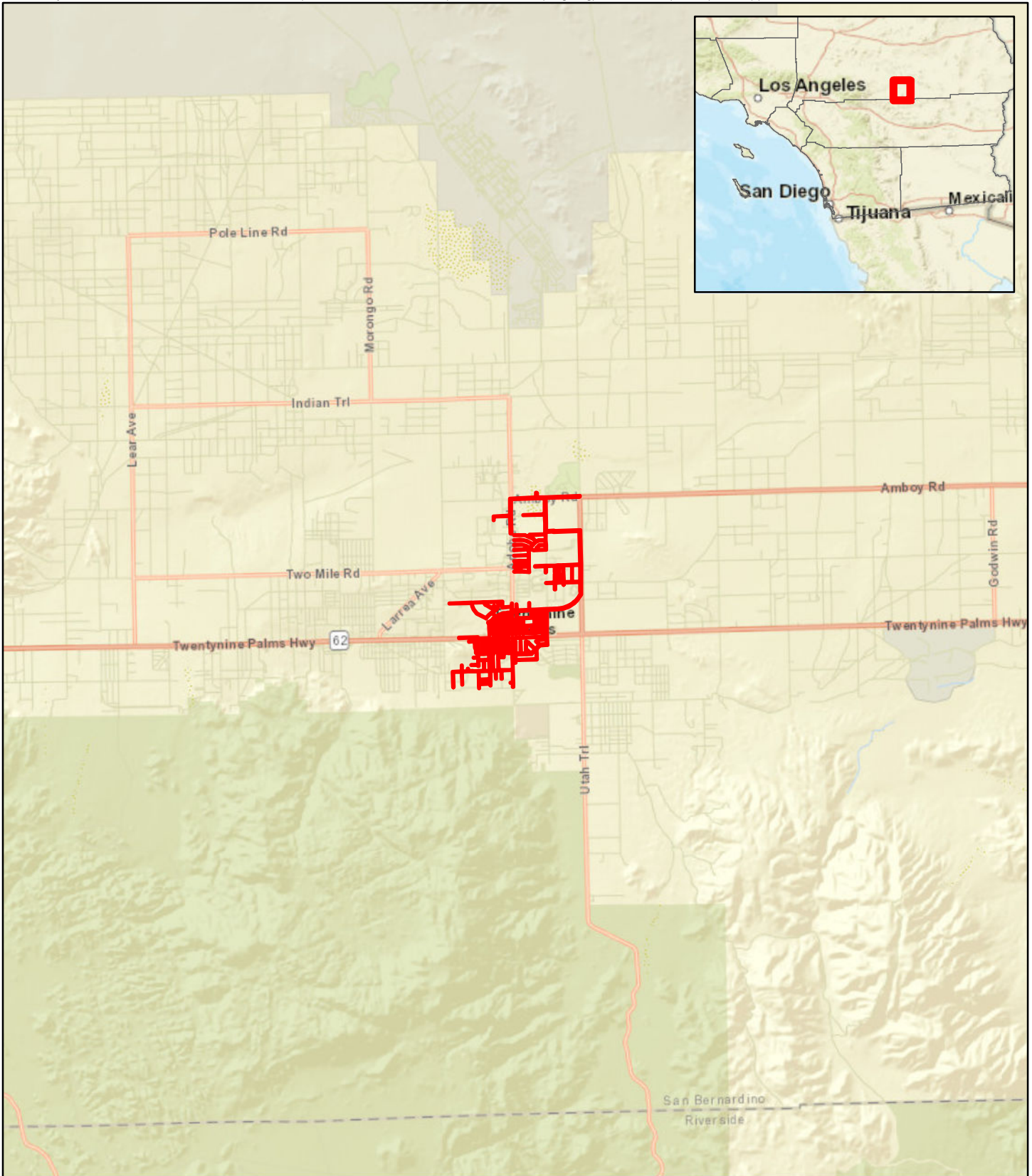
Phase 1 includes:

- Trunk sewers for Phase 1.
- Collector sewers for Phase 1.
- Two existing package treatment plants for the Turtle Rock and Desert Knoll Developments.
- The two large dense military housing developments on Two Mile Road and Joe Davis Drive.
- The residential area northeast of the Adobe Road – Two Mile Road intersection.
- The commercial area on Adobe Road and Amboy Road north of Samarkand Drive.

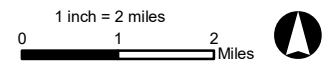
Phase 2 includes:

- Trunk sewers for Phase 2.
- Collector sewers for Phase 2.
- Two planned package treatment plants for project Phoenix and the Wander Hotel.
- The dense downtown area east of Donnell Hill. This area has a balanced mix of both residential and commercial land use.

See Figure 3 for a project overview.



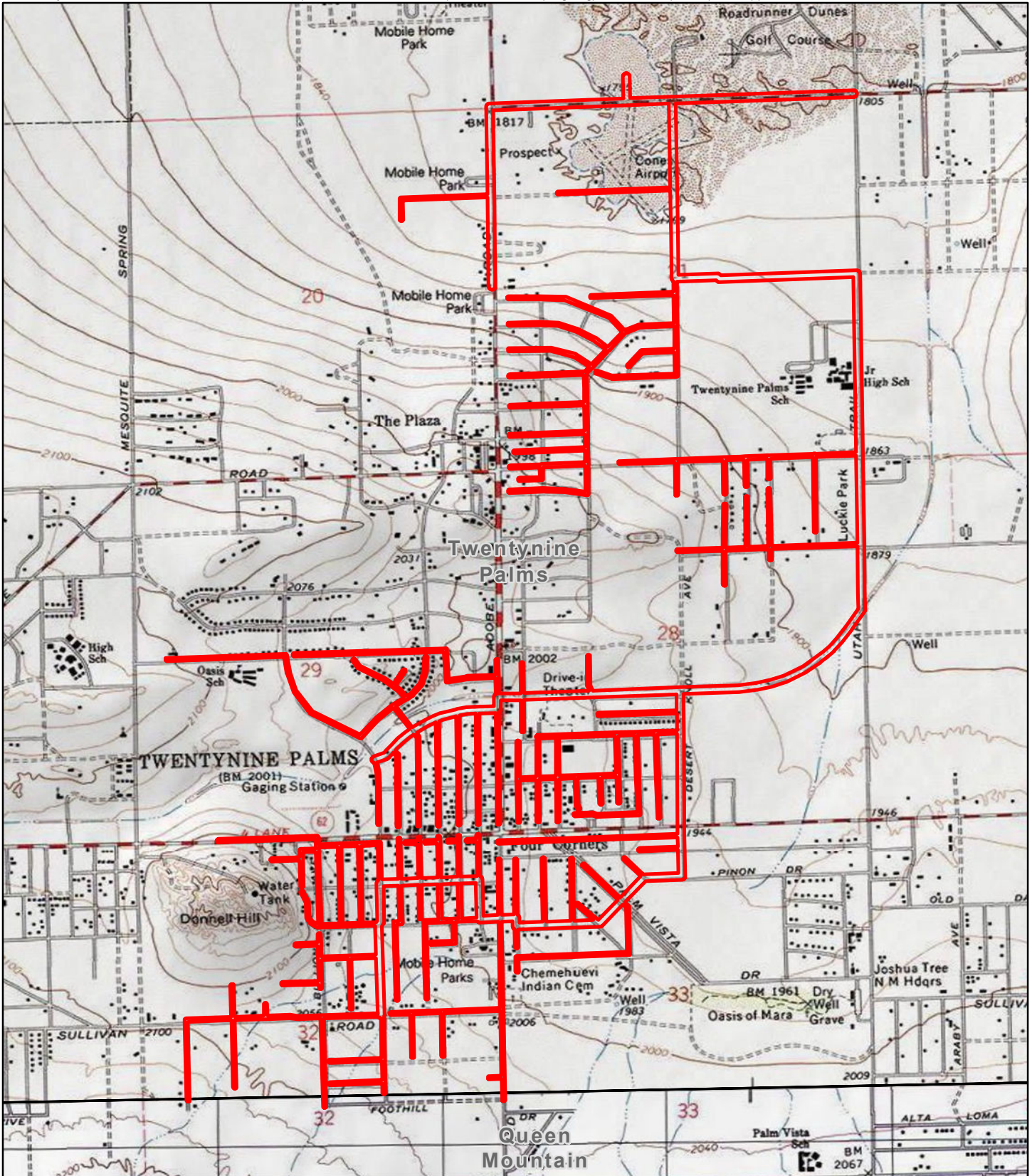
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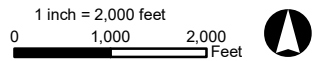
 Project Area

FIGURE 1
Regional Vicinity
Twentynine Palms Wastewater Collection System
Phases 1 and 2
Sensitive Plant Surveys
Twentynine Palms, CA

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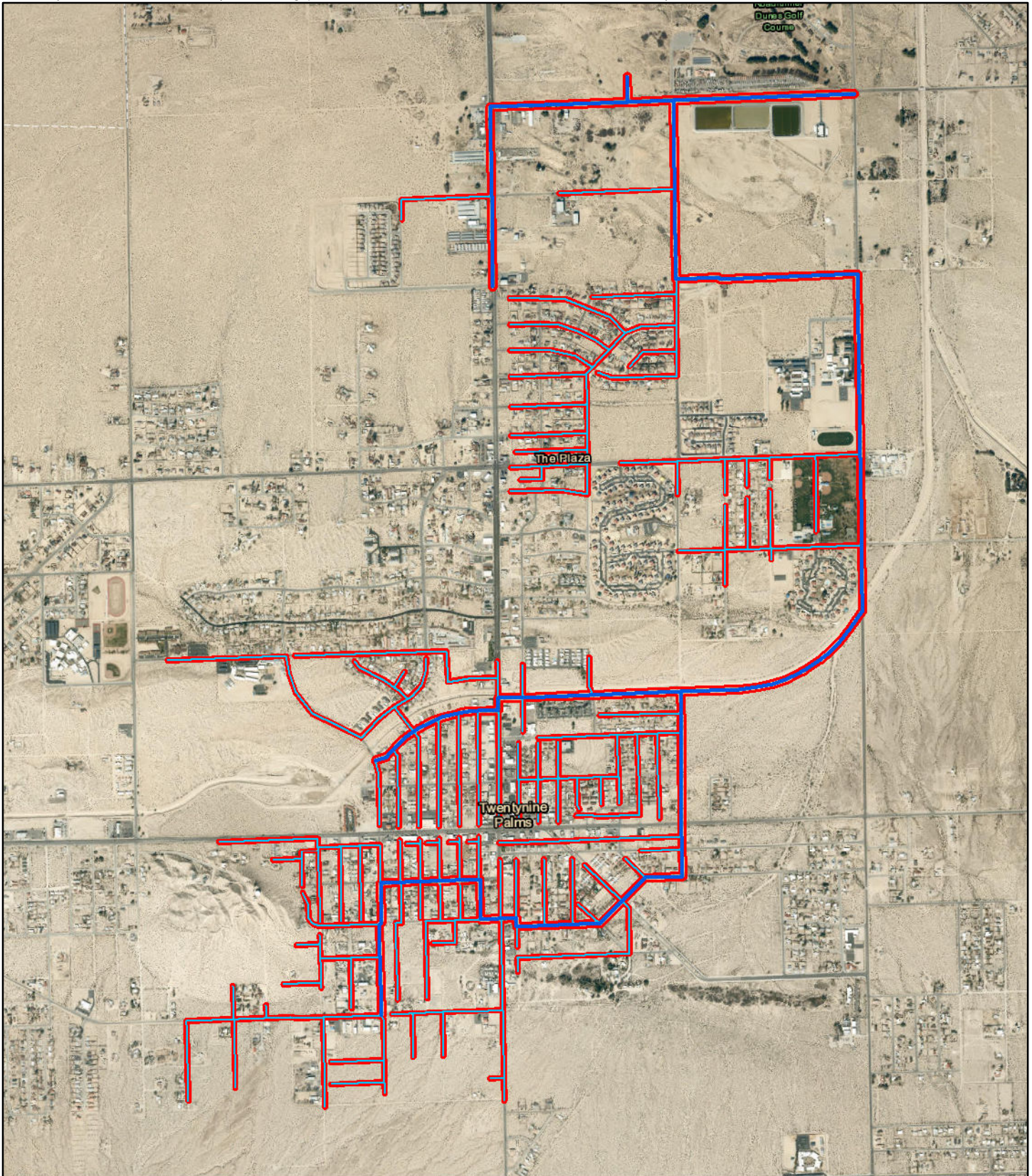
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 Project Area




FIGURE 2
USGS 7.5" Topo Quad: Twentynine Palms
Twentynine Palms Sanitation
Sewer Trunk Line Project
Sensitive Plant Surveys
Twentynine Palms, CA

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-  Proposed Trunk Sewer
-  Proposed Collector Sewer
-  Project Area

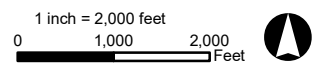


FIGURE 3
Project Overview
Twentynine Palms Sanitation
Sewer Trunk Line Project
Sensitive Plant Surveys
Twentynine Palms, CA

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2.0 REGULATORY FRAMEWORK

2.1 Federal

National Environmental Policy Act (NEPA) – Portions of the proposed project could fall under the jurisdiction of a federal agency (i.e., U.S. Army Corps of Engineers). The NEPA establishes certain criteria that must be adhered to for any project that is “financed, assisted, conducted or approved by a federal agency. The federal lead agency is required to “determine whether the proposed action will significantly affect the quality of the human environment.”

2.2 State of California

California Endangered Species Act (CESA) – This legislation is similar to the federal ESA, however it is administered by the CDFW. The CDFW is authorized to enter into “memoranda of understanding” with individuals, public agencies, and other institutions to import, export, take, or possess state-listed species for scientific, educational, or management purposes. The CESA prohibits the take of state-listed species except as otherwise provided in state law. Unlike the federal ESA, the CESA applies the take prohibitions to species currently petitioned for state-listing status (candidate species). State lead agencies are required to consult with the CDFW to ensure that actions are not likely to jeopardize the continued existence of any state-listed species or result in the destruction or degradation of occupied habitat.

Section 2081 of the State Fish and Game Code – Under Section 2081 of the California Fish and Game Code, the CDFW authorizes individuals or public agencies to import, export, take, or possess state endangered, threatened, or candidate species in California through permits or memoranda of understanding. These acts, which are otherwise prohibited, may be authorized through permits or “memoranda of understanding” if (1) the take is incidental to otherwise lawful activities, (2) impacts of the take are minimized and fully mitigated, (3) the permit is consistent with regulations adopted in accordance with any recovery plan for the species in question, and (4) the applicant ensures suitable funding to implement the measures required by the CDFW. The CDFW shall make this determination based on the best scientific information available and shall include consideration of the species’ capability to survive and reproduce.

California Environmental Quality Act (CEQA) – The basic goal of the CEQA is to retain a high-quality environment now and in the future. The specific goals are for California’s public agencies to:

- Identify the significant environmental effects of their actions; and, either
- Avoid those significant environmental effects, where feasible; or
- Mitigate those significant environmental effects, where feasible.

The CEQA applies to “projects” proposed to be undertaken or requiring approval by State and/or local governmental agencies. projects are activities which have the potential to have a physical

impact on the environment and may include the enactment of zoning ordinances, the issuance of conditional use permits and the approval of tentative subdivision maps. Where a project requires approvals from more than one public agency, the CEQA requires one of these public agencies to serve as the "lead agency."

A "lead agency" must complete the environmental review process required by the CEQA. The most basic steps of the environmental review process are:

- Determine if the activity is a "project" subject to the CEQA;
- Determine if the "project" is exempt from the CEQA;
- Perform an Initial Study to identify the environmental impacts of the project and determine whether the identified impacts are "significant". Based on its findings of "significance", the lead agency prepares one of the following environmental review documents:
 - Negative Declaration if it finds no "significant" impacts;
 - Mitigated Negative Declaration if it finds "significant" impacts but revises the project to avoid or mitigate those significant impacts;
 - Environmental Impact Report (EIR) if it finds "significant" impacts.

While there is no ironclad definition of "significance", Article 5 of the CEQA Guidelines provides criteria to lead agencies in determining whether a project may have significant effects.

The purpose of an EIR is to provide state and local agencies and the public with detailed information on the potentially significant environmental effects which a proposed project is likely to have and to provide ways in which those effects may be minimized and indicate alternatives to the project.

The Native Plant Protection Act (NPPA) – The NPPA includes measures to preserve, protect, and enhance rare and endangered native plant species. Definitions for "rare and endangered" are different from those contained in the CESA. However, the list of species afforded protection in accordance with the NPPA includes those listed as rare and endangered under the CESA. The NPPA provides limitations on take as follows: "no person will import into this state, or take, possess, or sell within this state" any rare or endangered native plants, except in accordance with the provisions outlined in the act. If a landowner is notified by the CDFW, pursuant to section 1903.5 that a rare or endangered plant species is growing on their property, the landowner shall notify the CDFW at least 10 days prior to the changing of land uses to allow the CDFW to salvage the plants.

3.0 METHODS

3.1 Literature Review and Records Search

A literature review and record search were conducted to identify occurrences of special status biological resources in the project vicinity. The review included:

- A report from the CDFW's California Natural Diversity Data Base (CNDDDB) for a five-mile radius of the project site (CDFW 2022),
- The California Native Plant Society (CNPS) including records from the following California USGS 7.5-minute topographic quadrangles within five miles of the project: 29 Palms, Queen Mountain, Sunfair, Indian Cove, 29 Palms Mountain, and Valley Mountain (CNPS 2022),
- Pertinent documents from the Wood library and project files (*e.g.*, other biological surveys from the general vicinity).

3.2 Sensitive Plant Surveys

Field reconnaissance surveys were conducted by Wood Senior Biologist John F. Green on 22 and 28 March 2022 to evaluate the suitability of existing habitat onsite to support special status biological resources. The areas identified as being suitable for the detection of rare plants were then surveyed by a team of Wood biologists from 5 through 12 April 2022 and from 13 through 15 June 2022. Wood PhD botanist Timothy Chumley led the effort and was in the field on all survey days. Other Wood biologists conducting focused surveys during that time period included John F. Green, Nathan Moorhatch, Michael Wilcox, Alec Williams, Phil Clevinger, Lauryn Duoto, Emily Urquidi, Kevin Salgado, and Melanie Bukovac. Survey methodology was guided by CDFW (2018), CNPS (2001), and USFWS (2000). All plant species observations were recorded in field notes and special status species locations were recorded using Global Positioning System (GPS) technology. Representative photos were taken (see cover page).

4.0 RESULTS

4.1 Literature Review

The results of the literature review and focused surveys are presented in Table 1.

Table 1. Special Status Plants & Vegetation Which Occur or Potentially Occur in the Vicinity of the Proposed Project						
Scientific Name	Common Name	Status ¹			Habitat (for plants includes elevational range in meters & blooming period)	Occurrence Probability ²
		Federal	State	CRPR		
<i>Ayenia compacta</i>	California ayenia	None	S3	2B.3	Mojavean & Sonoran desert scrub, rocky. 150 - 1095 meters (m). Blooms (B): March - April.	Absent Not found during any survey.
<i>Calochortus striatus</i>	alkali mariposa-lily	None	S2S3	1B.2	Chaparral, chenopod scrub, meadows and seeps, Mojavean desert scrub, alkaline, mesic. 70 - 1595 m. B: April - June.	Absent CNDDDB records on project site, but not found during any survey.
<i>Coryphantha alversonii</i>	Alverson's foxtail cactus	None	S3	4.3	Mojavean and Sonoran desert scrub, usually in granitic areas, sometimes rocky or sandy. 75 - 1525 m. B: April - June (September -October).	Occurs Found during April and June focused surveys.
<i>Eschscholzia androuxii</i>	Joshua tree poppy	None	S3	4.3	Joshua tree "woodland", Mojavean desert scrub on flats, gravelly, rocky, sandy, slopes, washes. 585 - 1685 m. B: February -May (June).	Absent Not found during any survey.
<i>Funastrum utahense</i>	Utah vine milkweed	None	S4	4.2	Mojavean and Sonoran desert scrub, sometimes in gravelly or sandy. 100 - 1435 m. B: (March) April - June (September - October).	Occurs Found during April and June focused surveys.
<i>Galium angustifolium ssp. gracillimum</i>	slender bedstraw	None	S4	4.2	Joshua tree "woodland" and Sonoran desert scrub in granitic or rocky places. 130 - 1550 m. B: April -June (July).	Absent Not found during any survey.

Table 1. Special Status Plants & Vegetation Which Occur or Potentially Occur in the Vicinity of the Proposed Project						
Scientific Name	Common Name	Status ¹			Habitat (for plants includes elevational range in meters & blooming period)	Occurrence Probability ²
		Federal	State	CRPR		
<i>Grusonia parishii</i>	Parish's club-cholla	None	S2	2B2	Mojavean and Sonoran desert scrub, Joshua tree "woodland" in sandy or rocky locations. 300-1524m. B: May-July.	Absent Not found during any survey.
<i>Jaffueliobryum raui</i>	Rau's jaffueliobryum moss	None	S2	2B.3	Alpine dwarf scrub, chaparral, & Mojavean and Sonoran desert scrub. Known from dry places, carbonate, openings, and rock crevices. 490 - 2100 m.	Absent Not found during any survey.
<i>Jaffueliobryum wrightii</i>	Wright's jaffueliobryum moss	None	S2S3	2B.3	Chaparral, Mojavean & Sonoran desert scrub, alpine dwarf scrub. Openings: dry places, rock crevices, carbonate. 160-2500 m.	Absent Not found during any survey.
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	None	S2	1B.1	Marshes and swamps, playas, vernal pools. 1 - 1220 m. B: February - June.	Absent CNDDDB records on project site, but not found during any survey.
<i>Linanthus maculatus</i> ssp. <i>maculatus</i>	Little San Bernardino Mountains linanthus	None	S2	1B.2	Desert dunes, Sonoran and Mojavean desert scrub, Joshua tree "woodland." Sandy places. Usually in light-colored quartz sand; often in wash or bajada. 140 – 1220 m. B: March-May	Absent Not found during any survey.
<i>Matelea parvifolia</i>	spear-leaf matelea	None	S3	2B.3	Rocky places in Mojavean and Sonoran desert scrub. 440 - 1095 m. B: March -May (July).	Absent Not found during any survey.
<i>Monardella robisonii</i>	Robison's monardella	None	S3	1B.3	Pinyon-juniper woodland. 610 - 1500 m., B: (February) April – September (October).	Absent. No suitable habitat.
<i>Muhlenbergia appressa</i>	appressed muhly	None	S3	2B.2	Coastal scrub, Mojavean desert scrub, valley and foothill grassland in rocky places. 20 - 1600 m. B: April - May.	Absent Not found during any survey.

Table 1. Special Status Plants & Vegetation Which Occur or Potentially Occur in the Vicinity of the Proposed Project						
Scientific Name	Common Name	Status¹			Habitat (for plants includes elevational range in meters & blooming period)	Occurrence Probability²
		Federal	State	CRPR		
<i>Penstemon thurberi</i>	Thurber's beardtongue	None	S3	4.2	Chaparral, Joshua tree "woodland", Sonoran desert scrub, pinyon-juniper woodland. 500 - 1220 m. B: May-July.	Absent Not found during any survey.
<i>Saltugilia latimeri</i>	Latimer's woodland-gilia	None	S3	1B.2	Chaparral, Mojavean desert scrub, pinyon-juniper woodland. 400-1900m. B: March-June	Absent Not found during any survey.
<i>Sidalcea neomexicana</i>	salt spring checkerbloom	None	S2	2B.2	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, playas. 15 - 1530 m. B: March - June.	Absent CNDDDB records on project site, but not found during any survey.
<i>Tetracoccus hallii</i>	Hall's tetracoccus	None	S4	4.3	Mojavean and Sonoran desert scrub. 30 - 1200 m. B: January - May.	Absent Not found during any survey.
<i>Wislizenia refracta</i> ssp. <i>refracta</i>	jackass-clover	None	S1	2B.2	Desert dunes, playas, Mojavean and Sonoran desert scrub. 600 - 800 m. B: April - November.	Absent Not found during any survey.
<i>Yucca brevifolia</i>	western Joshua tree	None	SCT	None	Mojavean desert scrub, Joshua tree "woodland."	Absent Not found during any survey.

<p>¹Status Codes:</p> <p><u>Federal</u> FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate</p> <p><u>State</u> SE = State Endangered ST = State Threatened SCT=State Candidate FP = Fully Protected</p> <p>The California Natural Diversity Database program is a member of the NatureServe Network of natural heritage programs, & uses the same conservation status methodology as other network programs. Elements are ranked using standard criteria & definitions. This standardization makes the ranks comparable between organisms & across political boundaries.</p> <p>The three main categories that are taken into consideration when assigning an element rank are rarity, threats, & trends. Within these three categories, various factors are considered, including:</p> <ul style="list-style-type: none"> • Range extent, area of occupancy, population size, total number of occurrences, & number of good occurrences (ranked A or B). Environmental specificity can also be used if other information is lacking. 	<ul style="list-style-type: none"> • Overall threat impact as well as intrinsic vulnerability (if threats are unknown). • Long-term & short-term trends. <p>S1 = Critically Imperiled – At very high risk of extirpation in the state due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors</p> <p>S2 = Imperiled – At high risk of extirpation in the state due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.</p> <p>S3 = Vulnerable – At moderate risk of extirpation in the state due to a fairly restricted range, relatively few populations or occurrences, recent & widespread declines, threats, or other factors.</p> <p>S4 = Apparently Secure – At a fairly low risk of extirpation in the state due to an extensive range &/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.</p> <p>S5 = Secure – At very low or no risk of extirpation in the</p>	<p>state due to a very extensive range, abundant populations or occurrences, & little to no concern from declines or threats.</p> <p>SX = Presumed Extirpated – Species is believed to be extirpated from the state Not located despite intensive searches of historical sites & other appropriate habitat, & virtually no likelihood that it will be rediscovered</p> <p>SH = Possibly Extirpated – Known from only historical records but still some hope of rediscovery. There is evidence that the species may no longer be present in the state, but not enough to state this with certainty.</p> <p>SNR = Unranked – State rank not yet assessed.</p> <p><u>California Rare Plant Rank (CRPR)</u> 1A = Presumed extirpated in California & either rare or extinct elsewhere 1B = Rare or Endangered in California & elsewhere 2A = Presumed extirpated in California, but more common elsewhere 2B = Rare or Endangered in California, more common elsewhere 3 = Plants for which we need more information – Review list 4 = Plants of limited distribution – Watch list</p> <p>²Occurrence Probability</p> <p><i>Occurs</i> = Observed on the site by Wood personnel or recorded there by other qualified biologists.</p> <p><i>High</i> = Observed in similar habitat in region by qualified biologists, or habitat on the site is a type often utilized by the species & the site is within the known range of the species.</p> <p><i>Moderate</i> = Reported sightings in surrounding region, or site is within the known range of the species & habitat on the site is a type occasionally used by the species.</p> <p><i>Low</i> = Site is within the known range of the species but habitat on the site is rarely used by the species.</p> <p><i>Absent</i> = A focused study failed to detect the species, or no suitable habitat is present.</p> <p><i>Unknown</i> = Distribution & habitat use has not been clearly determined.</p>
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4.2 Field Visits

Weather conditions during the focused surveys were favorable for the detection of plant species. All plant species detected (excluding obvious horticultural plantings) are included in Appendix A. Two sensitive plant species were detected: Alverson's foxtail cactus and Utah vine milkweed (see Figure 4 and the photographs on the cover page).



- Survey Area
- Vegetation Communities**
- Creosote Bush Scrub
- Developed/Disturbed
- Sensitive Plant Species**
- Utah vine milkweed

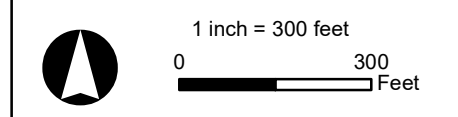
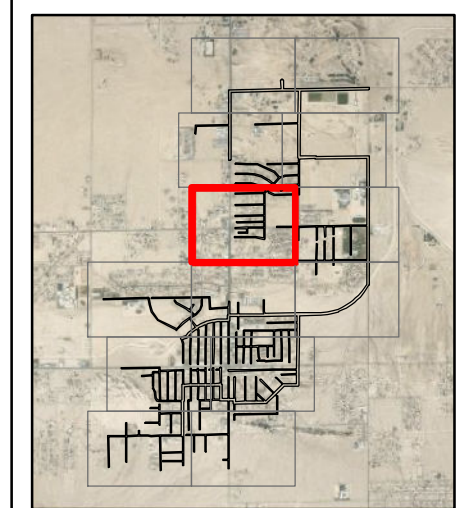
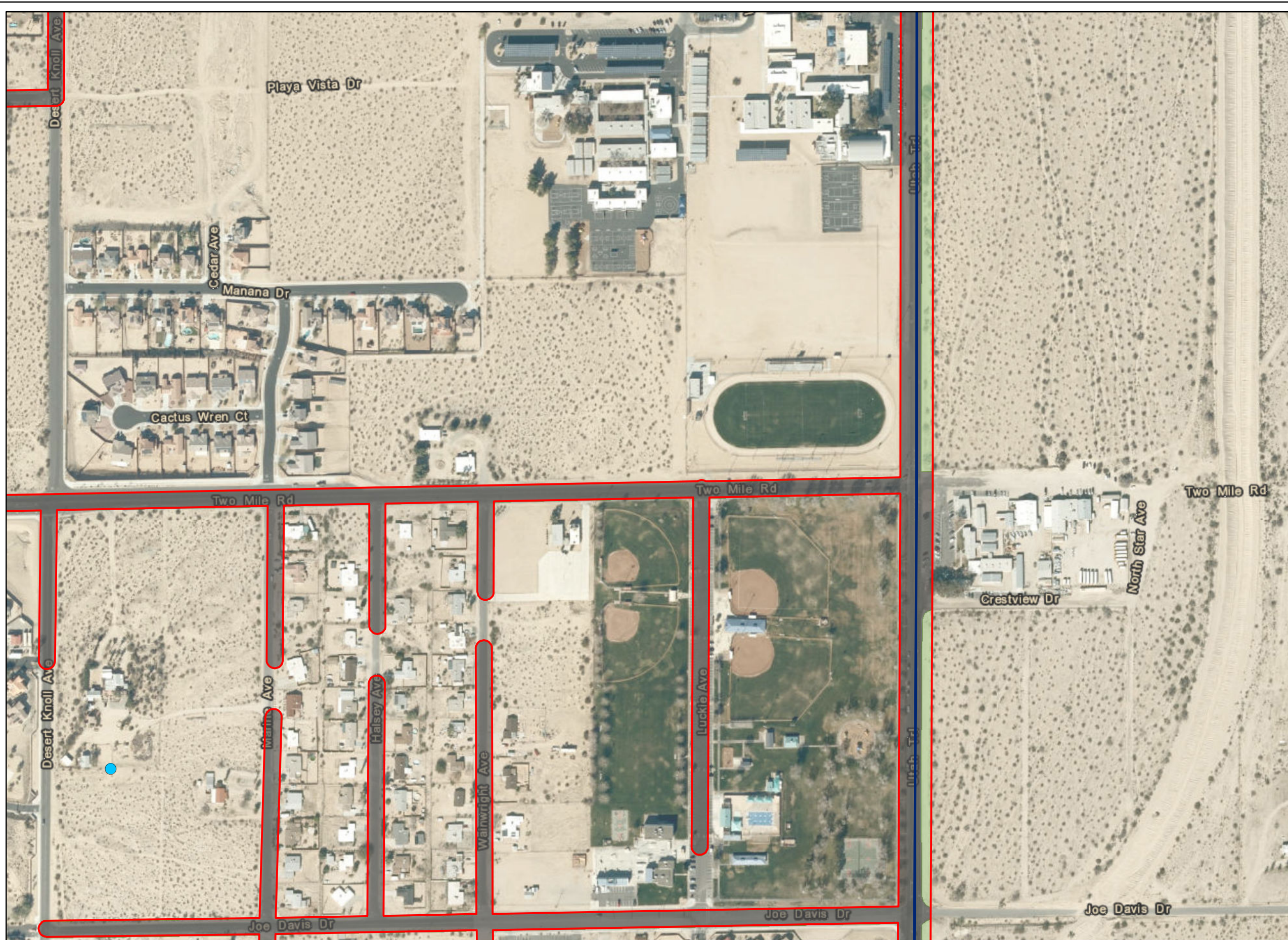







FIGURE 4a
 Sensitive Plant Detections
 Twentynine Palms Wastewater
 Collection System, Phases 1 & 2
 Twentynine Palms, CA



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
 Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



-  Proposed Trunk Sewer - Phase 1
-  Survey Area
- Vegetation Communities**
-  Creosote Bush Scrub
-  Developed/Disturbed
- Sensitive Plant Species**
-  Utah vine milkweed

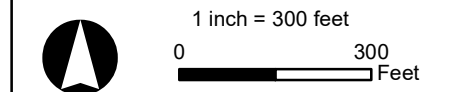
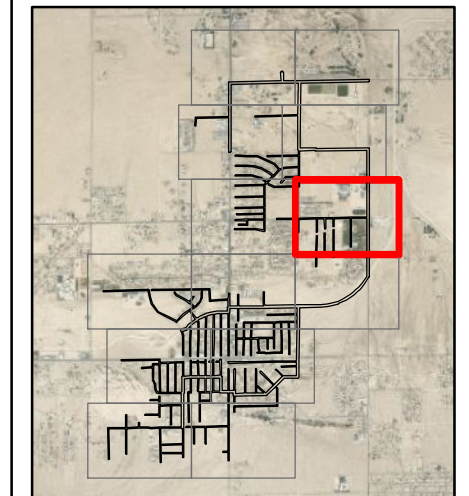
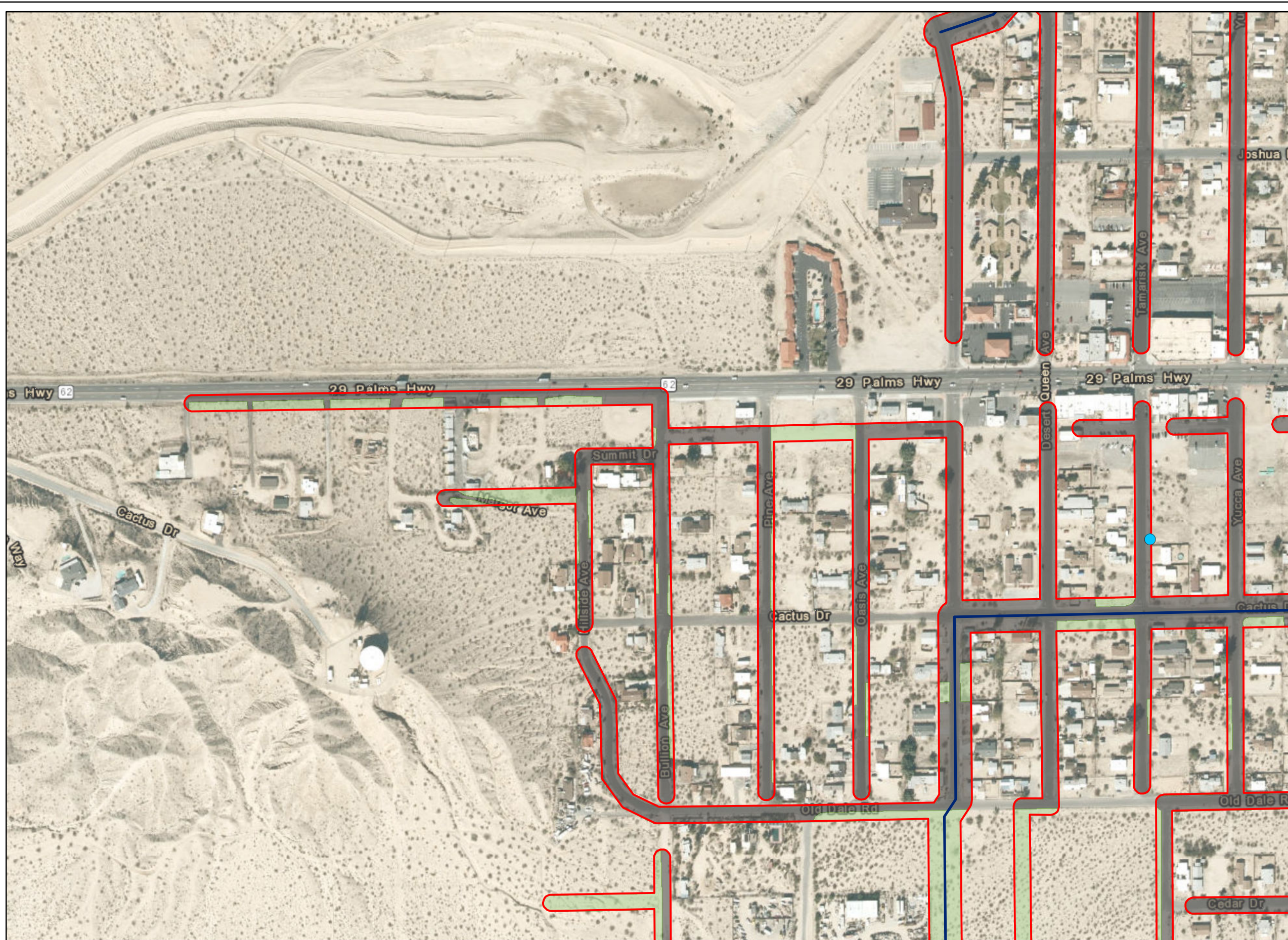







FIGURE 4b
 Sensitive Plant Detections
 Twentynine Palms Wastewater
 Collection System, Phases 1 & 2
 Twentynine Palms, CA



Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors
 Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



-  Proposed Trunk Sewer - Phase 1
-  Survey Area
- Vegetation Communities**
-  Creosote Bush Scrub
-  Developed/Disturbed
- Sensitive Plant Species**
-  Utah vine milkweed

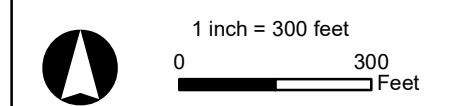
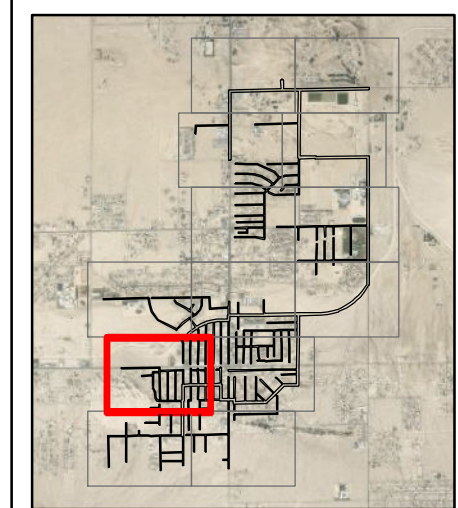
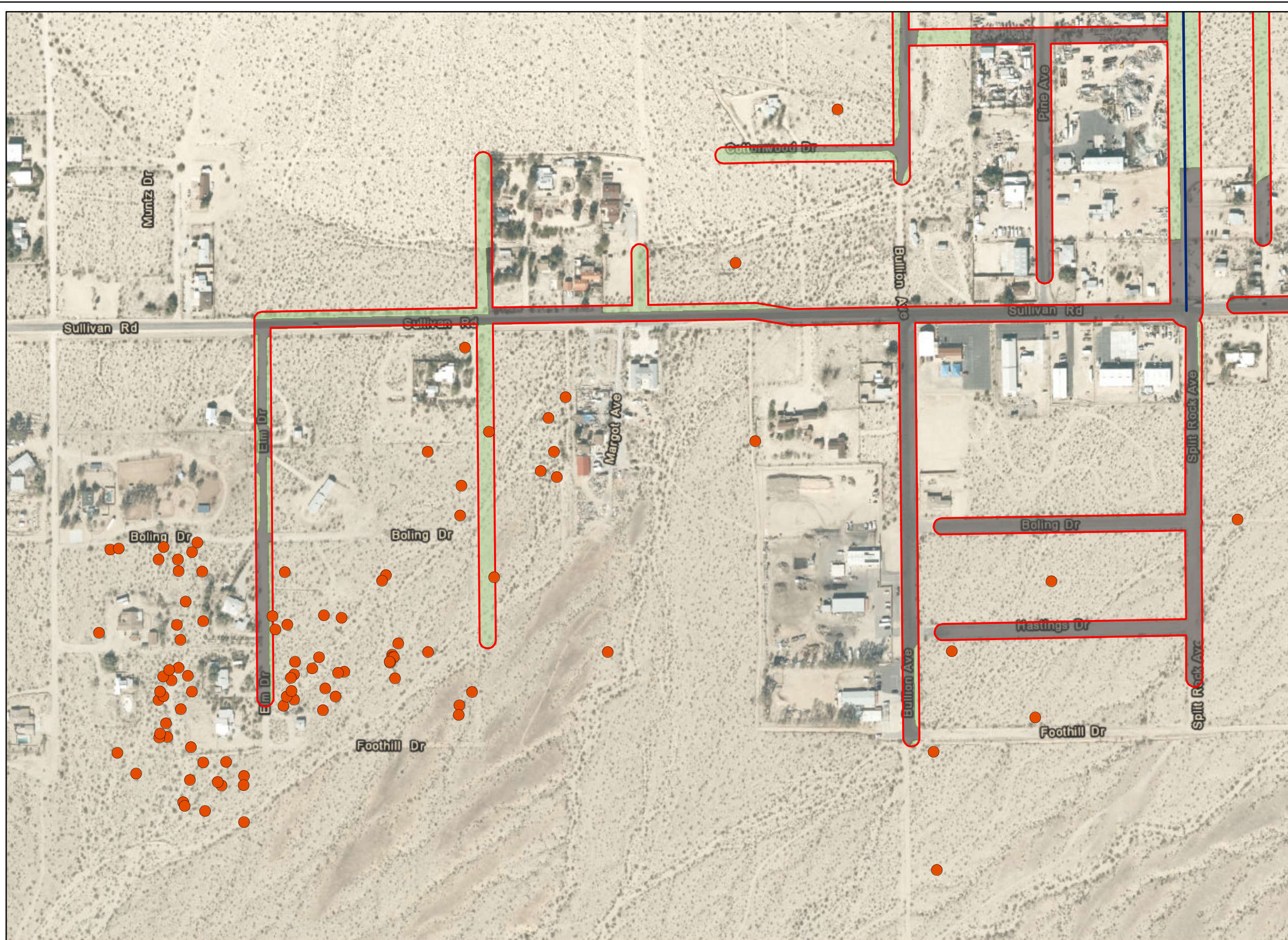


FIGURE 4c
 Sensitive Plant Detections
 Twentynine Palms Wastewater
 Collection System, Phases 1 & 2
 Twentynine Palms, CA





- Proposed Trunk Sewer - Phase 1
- Survey Area
- Vegetation Communities**
- Creosote Bush Scrub
- Developed/Disturbed
- Sensitive Plant Species**
- Alverson's foxtail cactus

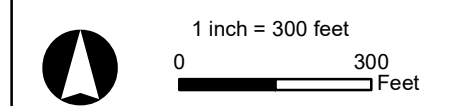
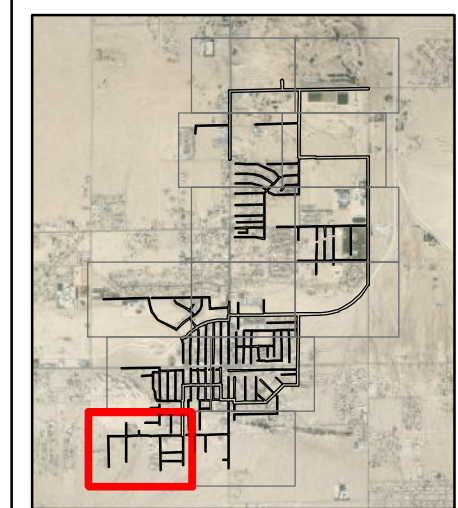


FIGURE 4d
 Sensitive Plant Detections
 Twentynine Palms Wastewater
 Collection System, Phases 1 & 2
 Twentynine Palms, CA



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5.0 DISCUSSION

Twenty special status plant species are known from project area habitats and elevations. Two do not occur: the Joshua tree (not detected by focused surveys) and Robison's monardella (no suitable habitat). Two were detected by focused surveys: Alverson's foxtail cactus and Utah vine milkweed. The remaining 16 species were not found by the focused surveys. We have marked them absent based on the focused survey results, however it is a drought year, and it is possible that some of these species failed to germinate and/or bloom at all this year.

Although the two sensitive plant species known to occur on site are not state or federally listed as threatened or endangered, impacts could be considered significant under the CEQA. Alverson's foxtail cactus and Utah vine milkweed should be avoided. A worker's environmental awareness program (WEAP) should be implemented to educate the construction crew of the special status plant species present on the project site. Biological monitoring should be conducted near their populations. If unavoidable, these plant species should be transplanted and/or have seeds and/or the topsoil around the plants (which contains the seed bank) collected with guidance from the CDFW. If additional special status plants are detected in the future due to a more favorable rainfall year, these same recommendations would apply.

6.0 REFERENCES

- California Department of Fish and Wildlife (CDFW). 2022. California Natural Diversity Database (CNDDDB) RareFind 5 records of sensitive elements.
- CDFW. 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities. With minor editorial revisions on February 3, 2021. Accessed online at: <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline>
- California Legislative Information. 2022. Fish and Game Code of California.
<http://leginfo.legislature.ca.gov/faces/codesTOCSelected.xhtml?tocCode=FGC&tocTitle=+Fish+and+Game+Code+-+FGC>
- California Native Plant Society (CNPS). 2022. Inventory of Rare, Threatened, and Endangered Plants of California. Accessed online at: <http://www.rareplants.cnps.org>
- CNPS. 2001. CNPS Botanical Survey Guidelines. Accessed online at: https://cnps.org/wp-content/uploads/2018/03/cnps_survey_guidelines.pdf
- Jepson Flora project. 2022. *Jepson eFlora*. Accessed online at: <http://ucjeps.berkeley.edu/IJM.html>
- NV5. 2022. City of Twentynine Palms Wastewater Feasibility Study, Draft Report. March 31.
- United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2019. Web Soil Survey. 31 July. Accessed online at: <http://websoilsurvey.nrcs.usda.gov/app/>
- USDA, NRCS. 2022. The PLANTS Database. National Plant Data Team. Accessed online at: <https://plants.usda.gov/java/>
- USFWS. 2020. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants. Accessed online at: https://cnps.org/wp-content/uploads/2019/10/Bot-Cert_US-Fish-and-Wildlife-Service-guidelines-botanical-inventories-LR.pdf
- United States Geological Survey (USGS). 2004. Mojave Desert Ecosystem Program: Central Mojave Vegetation Database.
- Wood, Environment & Infrastructure Solutions, Inc. (Wood). 2022. Wastewater Collection System, Phases 1 and 2 Draft Biological Resources Assessment. Unpublished report prepared for Terra Nova Planning and Research. May.

Appendix A Plant Species Detected

Plant Species Detected

GNETAE (GNETOPHYTA)

Ephedraceae

Ephedra californica

Ephedra Family

desert tea

EUDICOTS (EUDICOTIDAE)

Amaranthaceae

Amaranthus blitoides

Tidestromia suffruticosa var. *oblongifolia*

Amaranth Family

procumbent pigweed

honeysweet

Apocynaceae

Asclepias erosa

Asclepias subulata

***Funastrum utahense*

Dogbane and Milkweed Family

desert milkweed

rush milkweed

Utah vine milkweed

Asteraceae

Ambrosia acanthicarpa

Ambrosia dumosa

Ambrosia salsola

Baileya multiradiata

Bebbia juncea var. *aspera*

Chaenactis fremontii

Chaenactis stevioides

Dicoria canescens

Encelia farinosa

Encelia frutescens

Geraea canescens

Isocoma acradenia

**Lactuca serriola*

Laennecia coulteri

Malacothrix glabrata

Palafoxia arida

Rafinesquia neomexicana

**Sonchus asper* ssp. *asper*

Stephanomeria pauciflora

Sunflower Family

annual bur-sage

white bur-sage

cheesebush

desert marigold

sweetbush

Fremont pincushion

desert pincushion

desert twinbugs

brittlebush

button brittlebush

desert-sunflower

alkali goldenbush

prickly lettuce

Coulter's horseweed

desert dandelion

Spanish-needle

desert chicory

prickly sow thistle

wire-lettuce

Bignoniaceae

Chilopsis linearis ssp. *arcuata*

Trumpet-Creeper Family

desert willow

Boraginaceae

Amsinckia tessellata

Cryptantha dumetorum

Greeneocharis circumscissa

Johnstonella angustifolia

Pectocarya platycarpa

Pectocarya recurvata

Borage Family

bristly fiddleneck

scrambling cryptantha

cushion cryptantha

narrow-leaved Johnstonella

wide-toothed pectocarya

arched-nut pectocarya

Brassicaceae

**Brassica tournefortii*
Lepidium densiflorum
Lepidium fremontii
**Sisymbrium irio*
**Sisymbrium orientale*
Streptanthella longirostris

Cactaceae

***Coryphantha alversonii*
Cylindropuntia bigelovii
Cylindropuntia echinocarpa
**Cylindropuntia fulgida*
Cylindropuntia ramosissima
Echinocereus engelmannii
Ferocactus cylindraceus
Opuntia basilaris

Caryophyllaceae

Achyronychia cooperi

Chenopodiaceae

Atriplex canescens
Atriplex polycarpa
**Chenopodium murale*
**Salsola tragus*
Suaeda nigra

Cleomaceae

Peritoma arborea

Cucurbitaceae

Cucurbita palmata

Ehretiaceae

Tiquilia plicata

Euphorbiaceae

Croton californicus
**Euphorbia maculata*
Euphorbia polycarpa

Mustard Family

Sahara mustard
common pepperweed
desert pepperweed
London rocket
Indian hedgemustard
longbeak streptanthella

Cactus Family

(Alverson's) foxtail cactus
teddy-bear cholla
golden/silver cholla
jumping cholla
pencil cactus
Engelmann's hedgehog cactus
California barrel cactus
beavertail pricklypear

Pink Family

frost-mat

Goosefoot Family

four-wing saltbush
allscale saltbush
nettleleaf goosefoot
Russian thistle
bush seepweed

Spiderflower Family

bladderpod

Gourd and Melon Family

coyote melon

Ehretia Family

fan-leaved tiquilia

Spurge Family

California croton
spotted spurge
smallseed sandmat

Fabaceae

Caesalpinia gilliesii
Dalea mollissima
**Parkinsonia aculeata*
Parkinsonia florida
Prosopis glandulosa var. *torreyana*
Psoralea argophylla
Senegalia greggii
Senna armata

Geraniaceae

**Erodium cicutarium*

Hydrophyllaceae

Phacelia crenulata
Phacelia cf. *tanacetifolia*

Krameriaceae

Krameria bicolor

Lamiaceae

Condea emoryi
Salvia columbariae
Scutellaria mexicana

Loasaceae

Mentzelia albicaulis

Malvaceae

Eremalche exilis
**Malva parviflora*
Sphaeralcea ambigua

Nyctaginaceae

Abronia villosa var. *villosa*
Allionia incarnata
Boerhavia coccinea

Onagraceae

Chylismia claviformis
Eremothera boothii ssp. *desertorum*
Oenothera deltooides

Orobanchaceae

Aphyllon cooperi

Papaveraceae

Eschscholzia minutiflora

Legume Family

bird-of-paradise
soft prairie clover
Mexican palo verde
blue palo verde
honey mesquite
smoke tree
catclaw
spiny senna

Geranium Family

redstem filaree

Waterleaf Family

cleftleaf wildheliotrope
lacy phacelia

Rhatany Family

white rhatany

Mint Family

desert lavender
chia
bladder-sage

Loasa Family

whitestem blazingstar

Mallow Family

white mallow
cheeseweed
desert globemallow

Four-o'clock Family

desert sand verbena
trailing windmills
scarlet spiderling

Evening-Primrose Family

browneyes
desert suncup
Devil's lantern

Broom-Rape Family

desert broomrape

Poppy Family

pygmy poppy

Polygonaceae

Chorizanthe brevicornu
Chorizanthe rigida
Eriogonum deflexum
Eriogonum inflatum
Eriogonum reniforme
Eriogonum thomasii

Rosaceae

Petalonyx thurberi

Simmondsiaceae

Simmondsia chinensis

Solanaceae

Datura wrightii
**Nicotiana glauca*
Lycium cooperi

Tamaricaceae

**Tamarix aphylla*
**Tamarix ramosissima*

Viscaceae

Phoradendron californicum

Zygophyllaceae

Larrea tridentata

MONOCOTS (MONOCOTYLEDONAE)

Arecaceae

^*Washingtonia* sp.

Agavaceae

Yucca schidigera

Poaceae

Aristida purpurea
**Bromus rubens*
**Cynodon dactylon*
Dasyochloa pulchella
Festuca octoflora
Hilaria rigida
**Hordeum murinum*
**Pennisetum setaceum*
**Schismus* sp.

Buckwheat Family

brittle spineflower
Devil's spineflower
skeleton weed
desert trumpet
kidney-leaf wild buckwheat
Thomas' wild buckwheat

Loasa Family

sandpaper-plant

Jojoba Family

jojoba

Nightshade Family

sacred thorn-apple
tree tobacco
peach thorn

Tamarisk Family

athel
saltcedar

Mistletoe Family

desert mistletoe

Caltrop Family

creosote bush

Palm Family

fan palm

Century Plant Family

Mojave yucca

Grass Family

purple three-awn
red brome
Bermuda grass
low woollygrass
sixweeks grass
big galleta
wall barley
crimson fountain grass
Mediterranean grass

^Fan palms onsite were seedlings and presumed to have sprouted from the seeds of palms planted as landscaping on surrounding developments. They could potentially be *Washingtonia* native to California, but they are not native at this location.

Wastewater Collection System, Phases 1 & 2

Sensitive Plant Surveys

July 2022

KEY

- * = non-native species
- ** = special-status species
- cf. = compares favorably with
- sp. = plant identified to genus only

This list reports only plants observed on the site by this study. Other species may have been overlooked or undetectable due to their growing season. Plants were identified from keys, descriptions and drawings in the Jepson Flora Project (2022). Plant nomenclature and systematics follows the Jepson Flora Project and/or United States Department of Agriculture, Natural Resources Conservation Service (2022).