Appendix F

Paleontological Resources Memorandum

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September 1, 2020
Project No: 20-09625

William Patterson
Environmental Supervisor
Coachella Valley Water District
75-515 Hovley Lane East
Palm Desert, California 92211

Subject: Paleontological Resource Assessment for the 2020-2021 Non-Potable Water (NPW) Connections Project, Riverside County, California

Dear Mr. Patterson,

Rincon Consultants, Inc. (Rincon) conducted a paleontological resource assessment for the proposed 2020-2021 Non-Potable Water (NPW) Connections Project (project) located in Riverside County, California. Rincon prepared this study under contract to Coachella Valley Water District (CVWD) in support of the draft Initial Study and Mitigated Negative Declaration being prepared pursuant to the California Environmental Quality Act (CEQA). CVWD may pursue federal funding opportunities for the proposed action, including funding from the Clean Water State Revolving Fund (CWSRF). In California, administration of the CWSRF program has been delegated by the United States Environmental Protection Agency to the State Water Resources Control Board (SWRCB). Consequently, the SWRCB requires that all projects being considered under the CWSRF program must comply with certain federal environmental protection laws. The goals of this assessment are to identify the geologic units that may be impacted by development of the project, determine the paleontological sensitivity of geologic units underlying the project area, assess the potential for impacts to paleontological resources from development of the project, and recommend mitigation measures to reduce impacts to scientifically significant paleontological resources, pursuant to federal guidelines.

This paleontological resource assessment consisted of a fossil locality record search at the Natural History Museum of Los Angeles County (NHMLAC), a review of existing geologic maps and paleontological locality data, and a review of primary literature regarding fossiliferous geologic units within the project area and vicinity. Based on the results of the literature review and records search, Rincon assessed the paleontological sensitivity of the geologic units underlying the project area and determined the potential for impacts to significant paleontological resources. Recommendations are proposed to reduce impacts to less than significant levels.

Project Description

The project area is located in the Coachella Valley of central Riverside County, in the cities of Palm Desert, Rancho Mirage, Indian Wells, and La Quinta, as well as the community of Thousand Palms in unincorporated Riverside County. The project area is depicted in Township 4S, Range 5E and 6E, Sections 31, 32, 35 and 36, and Township 5S, Range 5E and 6E, Sections 2, 5, 6, 7 and 8 of the United States Geological Survey (USGS) Cathedral City, CA 7.5-minute quadrangle; Township 4S, Range 6E,

Sections 19, 20, 21, 27, 28, 29, 33, 34 and 35 of the USGS Myoma 7.5-minute quadrangle; and Township 5S, Range 6E, Sections 12, 13, 14 and 24, and Township 5S, Range 7E, Sections 18 and 19 of the USGS La Quinta 7.5-minute quadrangle (Figure 1 and Figure 2).

The proposed project involves the construction and operation of approximately 63,800 LF of NPW pipeline segments and connections within public rights-of-way and private lands. The project would provide irrigation water to nine new end users including Southwest Community Church, Indian Wells Tennis Garden, and seven golf courses: Tamarisk Country Club, Suncrest Country Club, Jack Ivey Ranch Country Club, Tri-Palms Country Club, Palm Royale Country Club, Desert Island Country Club (aka The S at Rancho Mirage), and Sunnylands Center and Gardens. The pipelines would convey NPW into existing water impoundments (surface lakes or ponds) located on-site at each golf course facility, and to a new water storage reservoir located near the Indian Wells Tennis Garden. The new storage reservoir would be lined and have a capacity of approximately one million gallons. The pond-like storage reservoir will be constructed in the vicinity of Indian Wells Tennis Garden to serve the Indian Wells Tennis Garden and Southwest Community Church facilities. Approximately 5,000 cubic yards of material would be exported off site for the construction of the new storage reservoir.

Also included is the installation of nine new motor-actuated valves and nine new CVWD meters. Each delivery point (end user connection) would be equipped with one motor actuated valve located in a belowground vault, adjacent to an existing golf course lake/pond where a discharge site is located. For all typical connections, the motor operated valve will be located in a control valve vault adjacent to a lined golf course lake discharge. The motor actuated valve will allow each terminal user to control delivery of NPW to the on-site water impoundment. NPW deliveries will be measured via CVWD-owned meters, located immediately outside of the public right-of-way within an easement obtained from the respective customer. Each meter vault will be equipped with an antenna and telemetry panel.

Figure 1 Regional Vicinity

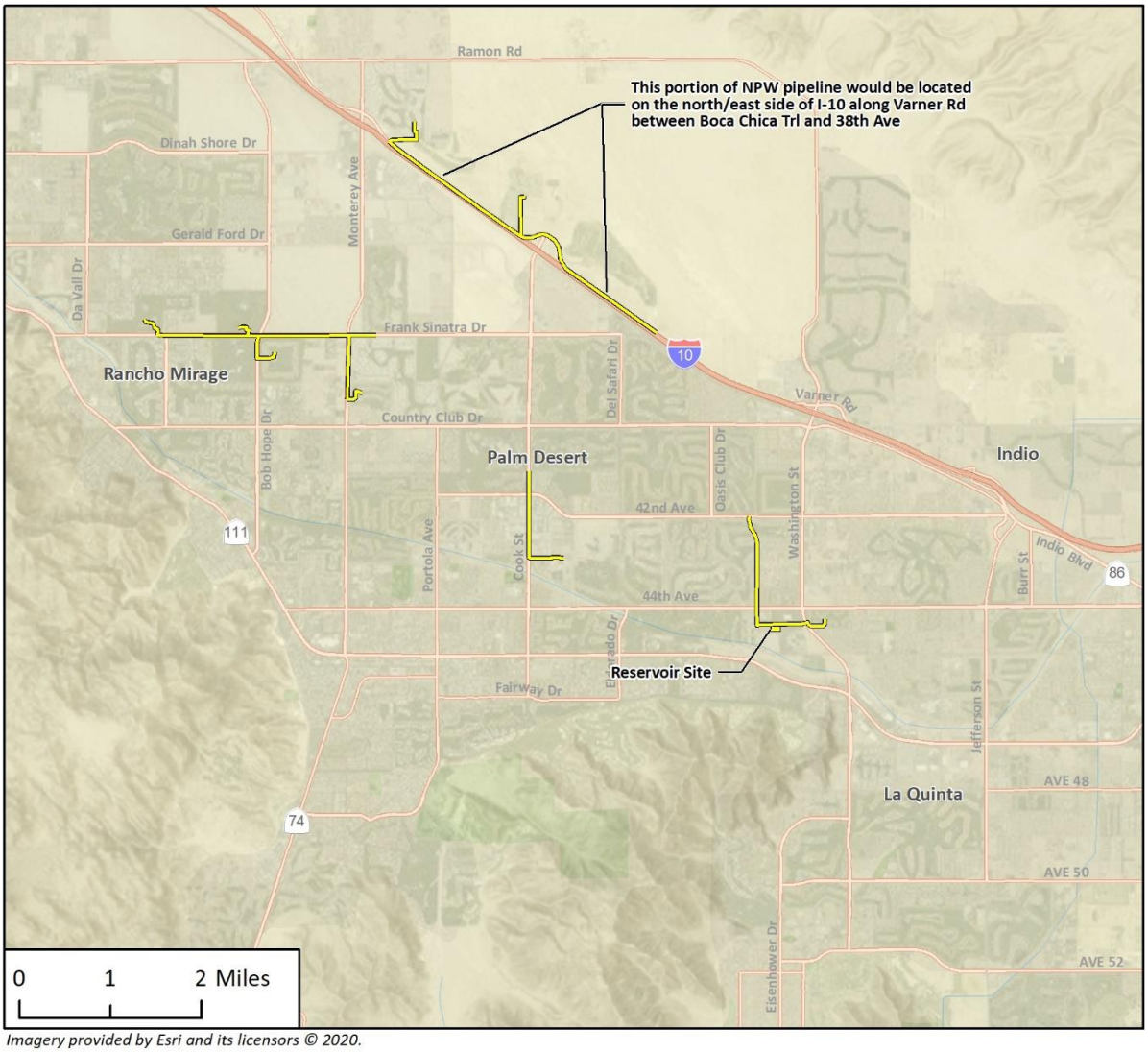
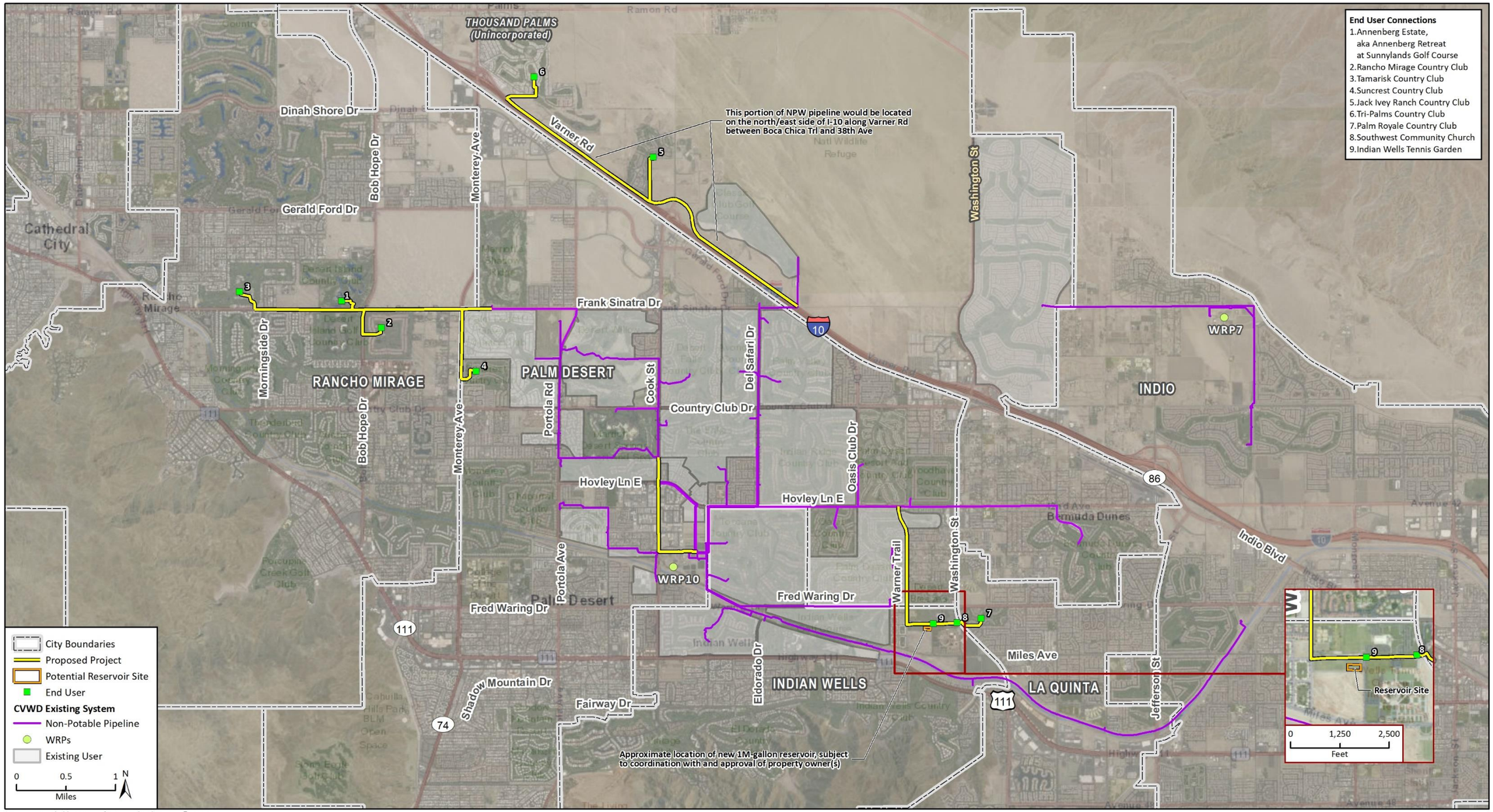


Figure 2 Project Vicinity



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Additional data provided by Coachella Valley Water District, 2020.

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Implementation of each of the proposed NPW pipeline segments would entail the following construction activities:

- Removal of existing ground cover (landscaping, asphalt, or concrete)
- Open trenching along the NPW pipeline alignment
- Placement of bedding within the trench
- Placement of NPW pipeline
- Backfilling of trenches and soil compaction
- Installation of meters and motor actuated valves

The new NPW pipeline segments would be constructed via open trench measuring approximately five feet in width and up to eight feet in depth. Ground disturbance for the proposed storage reservoir would reach depths of up to 15 feet below ground surface. Some native soil would remain on site to be used as backfill. Surplus soil would be exported for reuse or disposal at an approved facility. It is assumed that approximately 250,000 cubic feet, or approximately 9,260 cubic yards, of material would be exported in total. Finally, six inches of new asphalt and six inches of clean gravel would be imported to backfill and re-pave the project footprint within public rights-of-way. Export and import material quantities are summarized below:

- Export 115,000 cubic feet (4,259 cubic yards) of asphalt
- Export 250,000 cubic feet (9,260 cubic yards) of soil
- Import 285,000 cubic feet (10,500 cubic yards) of material

Regulatory Setting

Fossils are remains of ancient, commonly extinct organisms, and as such are nonrenewable resources. The fossil record is a document of the evolutionary history of life on earth, and fossils can be used to understand evolutionary pattern and process, rates of evolutionary change, past environmental conditions, and the relationships among modern species (i.e., systematics). The fossil record is a valuable scientific and educational resource, and individual fossils are afforded protection under federal, state, and local environmental laws, where applicable.

This study has been completed in accordance with the requirements of the California Environmental Quality Act (CEQA) and also includes compliance with federal and state regulations in the case a federal nexus is established during the course of project execution. A federal nexus may be established if federal funding is acquired and/or federal permitting is necessary. Compliance with both federal and state regulations allows the lead agency to apply the results of this technical study should a federal nexus be established at a later time. State regulations applicable to potential paleontological resources in the project area are summarized below.

Federal Regulations

A variety of federal statutes address paleontological resources specifically. They are applicable to all projects occurring on federal lands and may be applicable to specific projects if the project involves a federal agency license, permit, approval, or funding.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) (United States Code, Section 4321 et seq.; 40 Code of Federal Regulations, Section 1502.25), as amended, directs federal agencies to "preserve important historic, cultural, and natural aspects of our national heritage (Section 101(b) (4))." The current interpretation of this language includes scientifically important paleontological resources among those resources potentially requiring preservation.

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA) is part of the Omnibus Public Land Management Act of 2009 (Public Law 111-011 Subtitle D). The PRPA directs the Secretary of the Interior or the Secretary of Agriculture to manage and protect paleontological resources on federal land, and develop plans for inventorying, monitoring, and deriving the scientific and educational use of such resources. The PRPA prohibits the removal of paleontological resources from federal land without a permit, establishes penalties for violations, and establishes a program to increase public awareness about such resources. While specific to activity occurring on federal lands, some federal agencies may require adherence to the directives outlined in the PRPA for projects on non-federal lands if federal funding is involved, or the project includes federal oversight.

State Regulations

California Environmental Quality Act

Paleontological resources are protected under CEQA, which states in part a project will "normally" have a significant effect on the environment if it, among other things, will disrupt or adversely affect a paleontological site except as part of a scientific study. Specifically, in Section VII(f) of Appendix G of the State CEQA Guidelines, the Environmental Checklist Form, the question is posed thus: "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature." To determine the uniqueness of a given paleontological resource, it must first be identified or recovered (i.e., salvaged). Therefore, CEQA mandates mitigation of adverse impacts, to the extent practicable, to paleontological resources.

CEQA does not define "a unique paleontological resource or site." However, the Society of Vertebrate Paleontology (SVP) has defined a "significant paleontological resource" in the context of environmental review as follows:

> Fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are typically to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years) (SVP 2010).

The loss of paleontological resources meeting the criteria outlined above (i.e., a significant paleontological resource) would be a significant impact under CEQA, and the CEQA lead agency is responsible for ensuring that impacts to paleontological resources are mitigated, where practicable, in compliance with CEQA and other applicable statutes.

California Public Resources Code

Section 5097.5 of the Public Resources Code states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

Here "public lands" means those owned by, or under the jurisdiction of, the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, public agencies are required to comply with Public Resources Code Section 5097.5 for their own activities, including construction and maintenance, and for permit actions (e.g., encroachment permits) undertaken by others.

Methods

Rincon evaluated the paleontological sensitivity of the geologic units which underlie the project area using the results of the paleontological locality search and review of existing information in the scientific literature concerning known fossils in those geologic units. Rincon submitted a request to the NHMLAC for a list of known fossil localities from the project area and immediate vicinity (i.e., localities recorded on the USGS *La Quinta, Myoma,* and *Cathedral City,* California 7.5-minute topographic quadrangles), reviewed geologic maps, and reviewed primary literature. Rincon also reviewed the paleontological collections of online databases, including the University of California Museum of Paleontology (UCMP) and Paleobiology Database, to identify known fossil localities in Riverside County from the formations and geologic units identified in the project area.

Rincon assigned paleontological sensitivities to the geologic units underlying the project area consistent with the guidelines of the SVP. Paleontological sensitivity as defined by the SVP is consistent with federal guidelines outlined in the Bureau of Land Management's (BLM) Potential Fossil Yield Classification (PFYC) and provides sufficient sensitivity analysis to support federal review if required. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically sensitive geologic units. The SVP (2010) has defined paleontological sensitivity and developed a system for assessing paleontological sensitivity, as discussed below.

Paleontological Sensitivity

Significant paleontological resources are fossils or assemblages of fossils that are unique, unusual, rare, diagnostically important, or are common but have the potential to provide valuable scientific information for evaluating evolutionary patterns and processes, or which could improve our understanding of paleochronology, paleoecology, paleophylogeography, or depositional histories. New or unique specimens can provide new insights into evolutionary history; however, additional specimens of even well represented lineages can be equally important for studying evolutionary pattern and process, evolutionary rates, and paleophylogeography. Even unidentifiable material can provide useful data for dating geologic units if radiometric dating is possible. As such, common fossils (especially vertebrates) may be scientifically important, and therefore considered highly significant.

The SVP (2010) describes sedimentary rock units as having high, low, undetermined, or no potential for containing significant nonrenewable paleontological resources. This criterion is based on rock units in which significant fossils have been determined by previous studies to be present or likely to be present. While these standards were written specifically to protect vertebrate paleontological resources, all fields of paleontology have adopted these guidelines, which are given here verbatim:

I. **High Potential (Sensitivity).** Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered have a high potential for containing significant non-renewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations which contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas which contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas which may contain new vertebrate deposits, traces, or trackways are also classified as significant.

II. **Low Potential (Sensitivity).** Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and/or widespread invertebrate fossils of well documented and understood taphonomic, phylogenetic species and habitat ecology. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potentials for yielding significant fossils prior to the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations. However, as excavation for construction gets underway it is possible that significant and unanticipated paleontological resources might be encountered and require a change of classification from Low to High Potential and, thus, require monitoring and mitigation if the resources are found to be significant.

III. **Undetermined Potential (Sensitivity).** Specific areas underlain by sedimentary rock units for which little information is available have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to specifically determine the potentials of the rock units are required before programs of impact mitigation for such areas may be developed.

IV. **No Potential.** Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

Geologic Setting

The project area is situated in the Coachella Valley within the Colorado Desert geomorphic province of California (CGS 2002). The Colorado Desert extends from the Mojave Desert to the north, the Colorado River on the east, the Peninsular Ranges on the west, and south into Mexico. Dominant features within the Colorado Desert include the Salton Sea; the Colorado River; and the Orocopia, Chocolate, Palo Verde, and Chuckwalla mountains (Norris and Webb 1990). The Coachella Valley is located north of the Imperial Valley within the Salton Trough, a large structural depression that extends from the San Gorgonio Pass in the north to the Gulf of Mexico in the south. The Salton Trough is a graben structure, bounded by roughly parallel north-west-trending faults, including the San Andreas fault zone to the north and the San Jacinto and Elsinore faults to the southeast (Alles 2011).

The project area includes two (2) geologic units mapped at the ground surface: Quaternary young (middle to late Holocene) alluvium (Qal) and Quaternary young (middle to late Holocene) dune sand (Qs) (Rogers 1965; Dibblee and Minch 2008). Middle to late Holocene dune sand, mapped within the western and southern project areas, is composed of well-sorted, fine-to medium-grained windblown (eolian) sand and silt. Prior to development in the area, the eolian sand accumulated in significant deposits and formed widespread dunes. Middle to late Holocene dune sand overlies younger Quaternary (middle to late Holocene) alluvial deposits composed of unconsolidated to moderately consolidated, silt, sand, and clay, which are mapped at the surface in the northernmost and southernmost portions of the project area. Within the project area, Holocene alluvium is derived primarily as fluvial deposits from the Whitewater River, which flows immediately west. However, late to middle Holocene alluvial and eolian deposits (Qal, Qs) may transition to deposits of older alluvium (Qoa) or lacustrine sediments (Ql), of early Holocene to Pleistocene age, at unknown depths as discussed in more detail below. Quaternary old alluvium (Qoa), mapped at the surface approximately 5 miles northeast of the project area in Indio Hills, is described as moderately consolidated, gravel to fine-grained sand and silt by Dibblee and Minch (2008). Quaternary old (Pleistocene) lake deposits (Ql), mapped just southeast of the project area, represent the northernmost shoreline of the ancient Lake Cahuilla (Alles 2011; Deméré 2002; Waters 1983; Whistler et al. 1995). Quaternary Lake Cahuilla deposits are composed of weakly consolidated and interbedded sand, silt and clay, with tufa and travertine rock coatings; coarse alluvial deposits; and beach sands. These lacustrine sediments range from several feet deep at the margin of the Coachella Valley to as much as 300 feet thick in the center of the Salton Trough (Norris and Webb 1990; Waters 1983).

Figure 3 depicts the surficial geologic units in the project area as well as the corresponding paleontological sensitivity.

Results

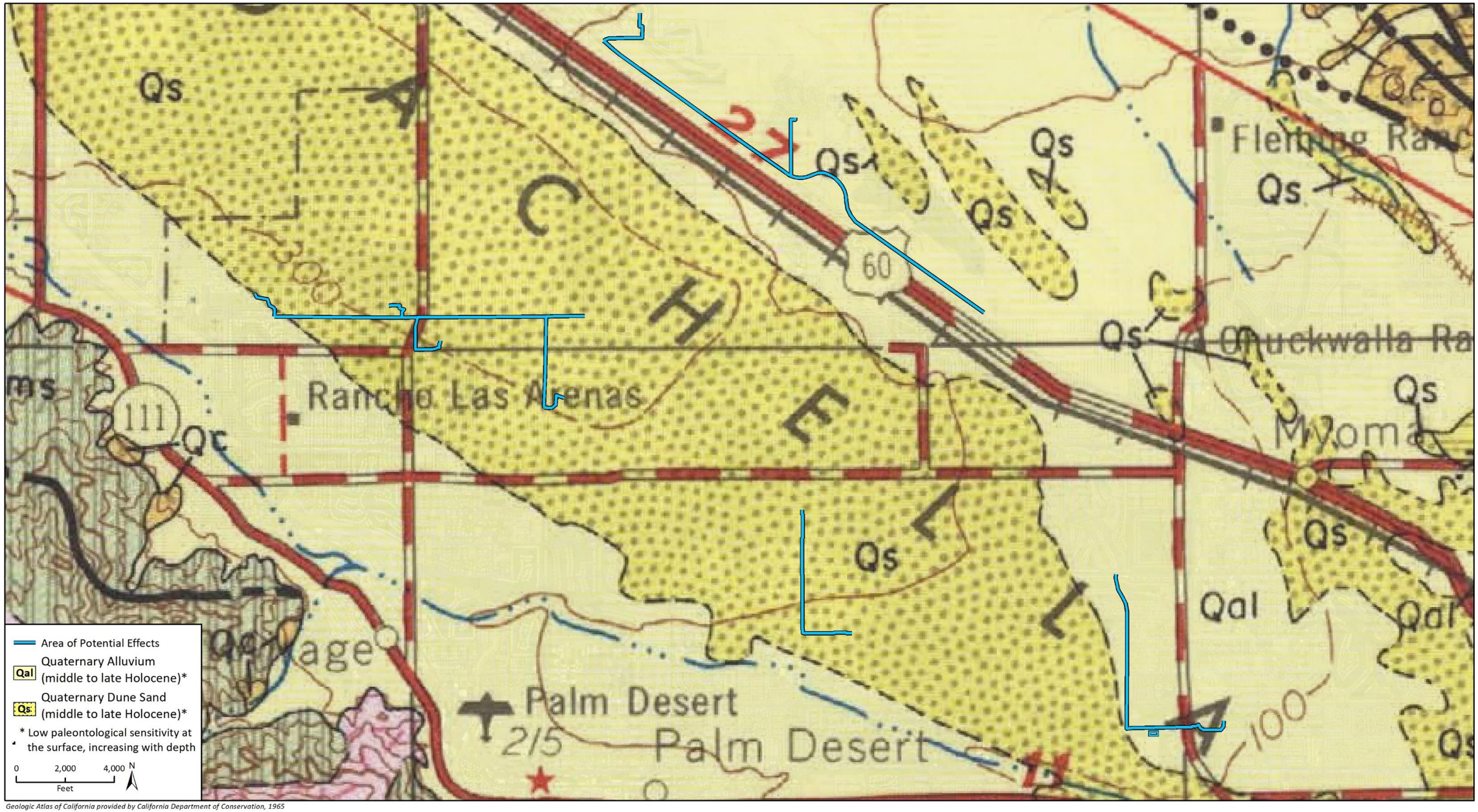
Locality Search

A search of the paleontological locality records at the NHMLAC resulted in no previously recorded fossil localities in the project area; however, the NHMLAC reports a vertebrate locality near the project area from early Holocene to late Pleistocene age deposits. LACM 1269 yielded a fossil specimen of horse (*Equus*) approximately seven miles north-northwest of the project area near Seven Palms Valley (McLeod 2020). The depth of recovery for this fossil locality was unreported (McLeod 2020).

Paleontological Sensitivity

The geologic units underlying the project area have been assigned a paleontological sensitivity ranging of low at the surface; with underlying units of high paleontological sensitivity. Late to middle Holocene alluvial (Qal) and eolian (Qs) deposits in the project area are too young (i.e., less than 5,000 years old) to preserve paleontological resources at or near the surface and are considered to have a **low paleontological sensitivity**. However, late to middle Holocene deposits may grade downward into more fine-grained deposits of early Holocene to late Pleistocene age that could preserve fossil remains at moderate or unknown depths. Quaternary old (early Holocene to late Pleistocene) alluvial sediments (e.g., Qoa) have a well-documented record of abundant and diverse vertebrate fauna

Figure 3 Geologic Units and Paleontological Sensitivity of the Project Area



Geologic Atlas of California provided by California Department of Conservation, 1965

throughout California. Localities have produced fossil specimens of mammoth (*Mammuthus columbi*), horse (*Equus*), camel (*Camelops*), and bison (*Bison*), as well as various birds, rodents, and reptiles (Agenbroad 2003; Jefferson 1985, 2010; Merriam 1911; Paleobiology Database 2020; Savage 1954; UCMP 2020). Quaternary old (Pleistocene) lacustrine deposits derived from ancient Lake Cahuilla have yielded scientifically significant mollusk shells within the Salton Trough (Whistler et al. 1995). Fossil specimens of diatoms, spores, pollen, land plants, sponges, ostracods, freshwater gastropods, fresher bivalves, fish, and small terrestrial vertebrates have been recovered from these older Quaternary Lake Cahuilla beds. Therefore, Quaternary old alluvial (i.e., Qoa) and lacustrine (i.e., Ql) deposits are assigned a **high paleontological sensitivity**.

Accurately assessing the boundaries between younger and older units within the project area is generally not possible without site-specific stratigraphic data, some form of radiometric dating or fossil analysis, so conservative estimates of the depth at which paleontologically sensitive units may occur reduces potential for impacts to paleontological resources. According to a geochronological analysis by Waters (1983), evidence of 4,000-year-old core sample, consisting of Quaternary old (Pleistocene) lake deposits (Ql), was reported approximately five miles south of Indio, at a depth of 20 feet below ground surface. Based on existing site conditions, available geochronological data, and the project area's proximity to exposures of older alluvial and lacustrine deposits (i.e., Qoa and Ql), Rincon estimates the transition between younger and older units in the project area likely to occur at approximately 20 feet below ground surface. Therefore, the paleontological sensitivity of the alluvial deposits within the project area is determined to be low to high, increasing at a depth of approximately 20 feet below ground surface, as defined by SVP (2010) standards.

Findings and Recommendations

Ground-disturbing activities in previously undisturbed portions of the project area underlain by geologic units with a high paleontological sensitivity (i.e., Quaternary old alluvial [Qoa] and lacustrine [Ql]deposits) may result in significant impacts to paleontological resources under CEQA. Impacts would be significant if construction activities result in the destruction, damage, or loss of scientifically important paleontological resources and associated stratigraphic and paleontological data. The activities may include grading, excavation, or other activities that disturb substantial quantities of the subsurface geologic units with a high paleontological sensitivity.

As proposed, project ground disturbance would reach a maximum depth of eight feet for trenching associated with the NPW pipeline segments and approximately 15 feet for excavations associated with the new water storage reservoir. In the project area, late to middle Holocene deposits overlie the paleontologically-sensitive Quaternary old sediments at an indeterminate depth but may be as extensive as 20 feet below ground surface (Waters 1983). Although fossiliferous deposits are unlikely to occur at depths above 20 feet, the possibility cannot be excluded in the context of a fluvial deposition system. The potential for encountering fossil resources during project-related ground disturbance is low, but there remains a low potential for impacts to paleontological resources.

The following measures are recommended to avoid impacts to paleontological resources in the case of unanticipated fossil discoveries. These measures would apply to all phases of project construction and would reduce the potential for impacts to unanticipated fossils present on site by providing for the recovery, identification, and curation of paleontological resources.

Worker's Environmental Awareness Program

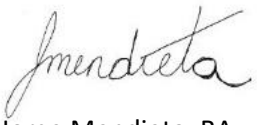
Prior to any project ground disturbance, a Worker's Environmental Awareness Program (WEAP) will be prepared and used to train all site personnel prior to the start of work. The WEAP training will include at a minimum the following information:

- Review of local and state laws and regulations pertaining to paleontological resources.
- Types of fossils that could be encountered during ground disturbing activity.
- Photos of example fossils that could occur on site for reference.
- Instructions on the procedures to be implemented should unanticipated fossils be encountered during construction, including stopping work in the vicinity of the find and contacting a qualified professional paleontologist.

Unanticipated Discovery

In the event an unanticipated fossil discovery is made during the course of project development, construction activity should be halted in the immediate vicinity of the fossil, and a qualified professional paleontologist should be notified and retained to evaluate the discovery, determine its significance and if additional mitigation or treatment is warranted. Work in the area of the discovery will resume once the find is properly documented and authorization is given to resume construction work. Any significant paleontological resources found during construction monitoring will be prepared, identified, analyzed, and permanently curated in an approved regional museum repository.

Sincerely,
Rincon Consultants, Inc.



Jorge Mendieta, BA
Associate Paleontologist

David Daitch, Ph.D.
Principal Investigator/Program Manager

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