COCOPAH INDIAN TRIBE

Cocopah Indian Reservation

Public Works Department

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CONSTRUCTION OF EAST COCOPAH LIFT STATION RENOVATION
INVITATION FOR BIDS

ADDENDUM #2
ISSUE DATE: July 1, 2026

1. **Modify the Invitation for Bids to include Exhibit E Geotechnical Report. See Exhibit E on the following page.**

EXHIBIT E

GEOTECHNICAL REPORT

GEOTECHNICAL EVALUATION
EAST COCOPAH SEWER LIFT STATION
SEC OF SALT CEDER STREET AND EAST MAIN CANAL
SOMERTON, ARIZONA

February 12, 2026

GeoTek Project No. 2666-AB

Prepared For:

BAI ENGINEERS
5350 DTC Parkway, #206
Greenwood Village, CO 80111

GeoTek, Inc.

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February 12, 2026
Project No. 2666-AB

BAI ENGINEERS
1776 Monano Road NW, Building 3
Los Ranchos, New Mexico 87107

Attention: Xuehua Bai, P.E.

Subject: **Geotechnical Evaluation**
East Cocopah Sewer Lift Station Renovation
SEC of Salt Ceder Street and East Main Canal
Approximate GPS Coordinates: 32.5693˚ N, -114.6728˚ W
Somerton, Arizona

In accordance with your request, GeoTek, Inc. (GeoTek) has completed a geotechnical evaluation for the proposed sewer lift station renovation and associated improvements. The purpose of our study was to evaluate the earth materials underlying the site and to provide recommendations for project design and construction based on our findings. This report outlines the general geologic and geotechnical conditions of the area and based on current data, provides earthwork and design recommendations with respect to those conditions.

SCOPE OF SERVICES

The scope of our services has included the following:

1. Review of soils and geologic reports and maps for the site (Appendix A).

2. Site reconnaissance and geotechnical mapping.

3. Review of aerial photographs.

4. Advancing and logging of 2 (Two) exploratory borings (Appendix B).

5. Obtaining samples of representative earth materials, as the borings were advanced.

6. Performing laboratory testing to measure physical and chemical properties on representative soil samples (Appendix C).

7. Assessment of potential geologic constraints.

8. Engineering and geologic analysis regarding foundation settlement, site preparation and foundation design/construction.

9. Preparation of this report.

SITE DESCRIPTION

The existing lift station lies at approximate GPS coordinates 32.5693˚ N, -114.6728˚ W in Cocopah Reservation in Somerton, Yuma County, Arizona. The site is bound by Salt Ceder Street to the north, the East Main Canal to the east, vacant land to the south, and single-family residences to the west. The approximate lift station location is shown on the enclosed Figure 1: Site Location Map.

Based on a review of historic aerial photographs available from Google Earth and the National Environmental Title Research (NETR) Online Historical Aerials Viewer website, the subject site has historically been depicted as relatively flat agricultural land since at least 1958. By this time, the East Main Canal had been developed to the east. Between 1963 and 1981, Salt Ceder Street was developed to the north and the existing residences to the west were constructed. The asphaltic concrete on Salt Ceder Street had been demolished by 1984 and was repaved with asphaltic concrete by 1992. The existing lift station and associated structures were constructed between 1996 and 2003. The site has remained in a relatively similar condition throughout recent aerial photographs. Artificial fills soils were encountered onsite due to prior construction for the lift station.

PROPOSED DEVELOPMENT

It is our understanding that the existing lift station wet well will be renovated, including replacing the discharge piping, above-ground piping, valves, pump rails, backup generator, the control panel (including associated components), and the installation of a new flow meter. Per request, recommendations have been provided for potential renovations to the at-depth conventional foundation system. The force main will also need to be relocated to accommodate the necessary improvements. It is our understanding that the existing lift station structure is approximately 21 feet below the existing ground surface.

FIELD STUDIES

Subsurface conditions at the site were explored by using a truck-mounted hollow-stem auger (HSA) drill rig. Two (2) exploratory borings were advanced onsite to depths up to approximately 31.5 feet bgs. Groundwater was encountered in both explorations at approximately 25 feet below the existing grade surface (bgs). Logs of each exploration are included with this report in Appendix B. The borings were located in the field by use of a cell phone application providing latitude and longitude coordinates. The locations should be considered accurate only to the degree implied by the location method used. The Unified Soil Classification System (USCS) was used to visually classify the subgrade soils. A representative of GeoTek conducted field mapping, logged the explorations, and obtained samples of representative material for laboratory testing. The approximate locations of the explorations are indicated on the enclosed Geotechnical Map (Figure 3).

REGIONAL GEOLOGY

Arizona is primarily divided into three physiographic provinces: the Basin and Range, Colorado Plateau, and the Central Highlands Transition Zone. The site is located within the Basin and Range Province. The Basin and Range Province spans the southern and western portions of Arizona, extending from southern Oregon and Idaho through Nevada, western Utah, eastern California, and down into central Mexico. Its geomorphology results from the extension and thinning of the continental crust, characterized by elongated mountain ranges trending northwest-southeast, separated by broad alluvial valleys. These mountains largely consist of tilted blocks of Precambrian, Paleozoic, Mesozoic, and Cenozoic rocks, bounded by faults and often severely eroded.

Within the Basin and Range Province, the site lies along the northeastern margin of the Salton Trough, the northern plate boundary of the Gulf of California plate, and encompasses the Yuma Mesa and Yuma Desert. The Yuma Mesa is comprised of the Chemehuevi Formation overlain by late Pleistocene alluvial terraces of Colorado River sediment deposited during a late Pleistocene aggradation period. The Yuma Desert or "upper mesa" includes older Colorado River deposits that correlate with upstream deposits of the Yuma Proving Ground. The Algodones Fault Zone trends through these geologic domains. Multiple faulting events in the late Pleistocene epoch have vertically displaced the upper mesa, contributing to erosional processes that have significantly altered the landscape.

Locally, the site vicinity lies within Holocene-aged older river floodplain and terrace deposits (Qy_1r). These units generally contain alluvial deposits derived from the Colorado River, colluvial deposits derived from the Chemehuevi Formation, and eolian (wind-blown) deposits. These deposits generally contain silt, sand, gravel, or cobbles.

SUBSURFACE MATERIALS

Artificial Fill Soils

Artificial fill materials were noted up to depths of approximately 4 feet bgs due to prior construction for the existing lift station. Additionally artificial fill materials likely underly existing improvements. Artificial fill soils generally consisted of silty sand with varying amounts of gravel. Deeper fills may be encountered locally. All artificial fill soils in structural areas will need to be removed, replaced, or processed, and cleaned of organic material and debris to be used as structural fill.

Native Alluvial and Colluvial Soils

Native alluvial and colluvial soils generally consisted of poorly graded sand with silt and silty sand with varying amounts of gravel. The relative density of native soils was generally medium dense, and the moisture content generally ranged from slightly moist to saturated at the depth of the groundwater table. The exploration logs presented in Appendix B should be referred to for more detailed information.

SURFACE & GROUND WATER

Surface water was not observed during our evaluation and onsite topography generally directs surface runoff towards the east, towards the East Main Canal. The project's design civil engineer should evaluate the potential for flooding. Seeps, springs, or other indications of high ground water levels were not noted on the subject property.

Ground water was encountered within both subsurface explorations advanced onsite at a depth of approximately 25 feet bgs. Monitoring of ground water at the site was outside the scope of this evaluation. Ground water level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, and other factors not evident in the time that field explorations were performed. Ground water levels during construction or at other times in the life of the structures may be higher or lower than the levels encountered during field explorations. The possibility of ground water fluctuations should be considered when developing the design of the project. If deep excavations (near the current groundwater level) onsite are anticipated, it should be expected that special excavation and fill placement measures may be necessary. Wet materials should be spread out and air-dried or mixed with drier soils to reduce their moisture content as appropriate for fill placement.

TECTONIC FAULTING AND REGIONAL SEISMICITY

The site is located approximately 12 miles south of the California-Arizona border. The geologic structure of western California is dominated by northwest-trending faults associated with the San Andreas system which divides the boundary between tectonic plates. The San Andreas Fault System is the nearest known fault located about 75 miles to the northwest near the Salton Sea in California. East of the San Andreas in California and Western Arizona is generally a region of moderate seismic activity. Geologic mapping of the area does not indicate any Quaternary faults along the site boundaries and no evidence of faulting onsite was observed during our field reconnaissance and review of historic aerial photos. Based on a review of seismic mapping by Zhang, 2019, the possibility of ground acceleration or shaking at the site may be considered as approximately similar to the Arizona region as a whole. It is recommended that all structures be designed and constructed in accordance with the International Building Code (IBC).

The lift station is located at approximate GPS coordinates 32.5693°N, -114.6728°W in Somerton, Yuma County, Arizona. Yuma County and Arizona as a state have adopted the 2018 International Building Code (IBC). Based on the onsite soils, the site may be characterized as Site Class "D" as determined by the IBC. The mapped spectral response accelerations (SA) for 0.2 second and 1.0 second periods at the site were determined from the ATC, Hazards by Location, Interpolated Probabilistic Ground Motion for the Conterminous 48 States by Latitude/Longitude, 2018 IBC reference document. The results are presented in the following table:

Mapped Spectral Response Acceleration (SA)	Value
0.2 sec period Mapped Spectral Acceleration (S_S)	0.610g
1.0 sec period Mapped Spectral Acceleration (S_1)	0.261g
0.2 sec period Site Amplification Factor (F_a)	1.312
1.0 sec period Site Amplification Factor (F_v)	* null
0.2 sec period Design Spectral Acceleration (SD_S) – Site Class D	0.531g
1.0 sec period Design Spectral Acceleration (SD_1) – Site Class D	* null

Secondary Seismic Constraints

The following list includes other potential seismic related hazards that have been evaluated with respect to the site, but in our opinion, the potential for these seismically related constraints to affect the site is considered negligible. The potential for liquefaction may require particular attention during project design and construction dependent upon the ground water table elevations and foundation improvements.

* Dynamic Settlements
* Surface Fault Rupture
* Ground Lurching or Shallow Ground Rupture

Land Subsidence and Earth Fissures

The site is not located within any mapped area of significant groundwater withdrawal by the Arizona Geologic Survey (AZGS) and AZGS data indicate that the site is not within an Earth Fissure Study Area. We did not observe indications of earth fissures during our aerial photograph review or our field exploration. Arizona state regulations require management of groundwater resources with a goal of safe-yield, a balance of withdraw and recharge. In the future, if groundwater levels were to decrease, subsidence may occur.

Summary

It is important to keep in perspective that if a seismic event were to occur on any major fault, intense ground shaking could be induced to this general area. Potential damage to any settlement sensitive structures would likely be greatest from the vibrations and impelling force caused by the inertia of the structures mass than that created from secondary seismic constraints. Considering the subsurface soil conditions and local seismicity, it is estimated that the site has a low risk associated with the potential for these phenomena to occur and adversely affect surface improvements. These potential risks are no greater at this site than they are for other structures and improvements developed on the alluvial materials in this vicinity.

RESULTS OF LABORATORY TESTING

Laboratory tests were performed on representative samples of the onsite earth materials in order to evaluate their physical and chemical characteristics. The tests performed and the results obtained are presented in Appendix C.

CONCLUSIONS

Based on our field exploration, laboratory testing, engineering, and geologic analyses, it is our opinion that the subject site is suited for development from a geotechnical engineering and geologic viewpoint. Ground water may be encountered during construction and the use of temporary dewatering systems may be required.

The recommendations presented herein should be incorporated into the final design, grading, and construction phases of development. The engineering analyses performed concerning site preparation, and the recommendations presented below have been completed using the information provided to us regarding site development. In the event that the information concerning proposed development is not correct, the conclusion and recommendations contained in this report shall not be considered valid unless the changes are reviewed, and conclusions of this report are modified or approved in writing by this office.

RECOMMENDATIONS - EARTHWORK CONSTRUCTION

General

All grading should conform to the International Building Code (IBC) and local requirements, except where specifically superseded in the text of this report. During earthwork construction all removals, overexcavation, and grading procedures should be observed, and the fill selectively tested by a representative of GeoTek. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered. It is recommended that the earthwork contractor(s) perform their own independent reconnaissance of the site to observe field conditions firsthand.

If the contractor(s) should have any questions regarding site conditions, site preparation, or the remedial recommendations provided, they should contact an engineer at GeoTek for any necessary clarifications prior to submitting earthwork bids. All applicable requirements of local and national construction and general industry safety orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met.

Demolition

The following recommendations are provided as guidelines in the event a structure is encountered that are not intended to remain.

1. All existing surface or subsurface structures (not intended to remain), within the area to be developed, should be razed and moved off site.

2. If a septic tank (to be abandoned or below a proposed improvement) is located within the project site, it is recommended that it be pumped out and with few exceptions likely removed. Any leach lines, seepage pits, or other pipes associated with this structure should also be removed or properly abandoned.

3. If any wells are encountered, an attempt should be made to identify the owner and purpose of the well. Well abandonment should adhere to the recommendations provided by the local jurisdiction or the Arizona Department of Water Resources Well Abandonment Handbook. Well casing should be removed and neat cement, cement-bentonite grout, or high-solids bentonite grout with a minimum of 25% solids by weight placed from the bottom of the borehole to the ground surface using a tremie pipe. If the well is located in the area of a proposed structure, these recommendations should be reviewed by GeoTek and if warranted, additional geotechnical recommendations will be offered.

Removals/Processing - General

Presented below are removal/processing recommendations for the various earth materials encountered on the project. Debris, vegetation, and other deleterious material should be stripped/removed from areas proposed for structural fill placement and disposed of offsite prior to the start of construction. All artificial fill and disturbed native soils, where encountered, within the proposed structural areas, should be removed to expose competent native material. Following removal of artificial fill and/or disturbed native soils, removals/processing into the underlying alluvial and colluvial materials should be accomplished to a minimum depth of 12 inches across any structural areas and as deep as necessary to accommodate the below recommended fill blanket. Locally deeper removals/processing may be necessary based on the conditions exposed (e.g., areas near natural drainages, etc.).

For uniform support of proposed improvements, structural areas for new foundations should be provided a minimum 12-inches of compacted structural fill below the bottom of the new foundations. During overexcavation for the fill blanket, the exposed ground surface should be scarified a minimum of 12-inches, moisture conditioned, and compacted to a minimum relative compaction of 95% percent of the laboratory test method ASTM D-698 in order to be considered competent to support the intended structures.

As over-excavation below bottom of the new foundation occurs, the excavation should be performed in sections rather than the entire length at once, so as not to impact the existing foundation. It is recommended that the excavations for the initial phase of "slotted removals" adjacent to the existing foundation be performed in approximately 8-foot linear sections, leaving a minimum of 8 linear feet of undisturbed earth in between each excavation to support the structure.

Once the initial excavations are properly backfilled, the remaining sections may be excavated. The existing foundations may need to be temporarily shored and the new foundations designed for additional loading.

Ground Water

Ground water was encountered during the field evaluation at a depth of approximately 25 feet bgs within both boring explorations. Once final site grades are determined by the civil engineer, it should be ensured that a minimum separation of 36 inches is provided between the bottom of all new foundations and the anticipated maximum static seasonal ground water level. If footing dimensions are changed, then the minimum separation will need to be increased dependent upon the finalized footing dimensions. Dependent upon the depth of the excavation, loose/soft or unstable soils could be encountered. Stabilizing the subgrade supporting the foundations with gravel, cobbles, lime or chemical treatment, and/or geogrid may be required.

Site Dewatering

Ground water seepage may be encountered during the overexcavation removals. A subdrain system may need to be constructed to temporarily collect and convey subsurface water to an appropriate location for drainage. The drainage trench should be excavated to a minimum depth of 3 feet below the planned bottoms. Filter fabric should be used to line the trench where the drain rock is to be placed (burrito wrap the drain rock).

As an alternative, ¾" aggregate base course material may be used without using filter fabric. However, it should be noted that if ¾" base course is used in lieu of drain rock and filter fabric, that the pumps will need to be significantly closer together to achieve the same level of dewatering. Electric pumps will be necessary to collect the accumulated water in the subdrain system then have the collected water pumped to an appropriate outlet. The electric pump system should have a backup in case of failure. The pump locations should be determined in the field. Any fluid discharged from the site should be properly disposed of and in compliance with local and national requirements. It should be anticipated that any trench may require shoring for stability during excavation.

Backfill Material

Bedding and pipe embedment materials to be used around the pipes should conform to the pipe manufacturer's recommendations and should be placed and compacted with local requirements, except where specifically superseded by the text of this report.

General pipeline backfill used above the pipe embedment zone should be placed and compacted in accordance with the following section of this report. It is our opinion that the onsite soils are suitable for use as general pipe backfill provided any debris, organics, or oversized materials are screened or removed during processing. Materials will need to be imported to the site for use as pipe embedment material. Requirements for pipeline embedment materials are further discussed in the *Fill Materials* section of this report.

Fill Placement

Subsequent to completing the recommended removals/processing and ground preparation, excavated onsite soils may be placed in relatively thin lifts (with a maximum lift thickness of 12 inches), cleaned of vegetation and debris, brought to within 2 percent of optimum moisture content, and compacted to a minimum relative compaction of 95 percent of the laboratory standard ASTM D-698. It should be noted that the maximum lift thickness requirement to meet both the minimum relative compaction and moisture content requirements is a function of several variables including (but not limited to) the type of soil (e.g., clay, silt, sand, gravel, cobbles, etc.), type and size of compaction equipment (e.g., sheep's foot roller, scraper, jumping jack, etc.), number of passes, frequency of operation of compaction equipment, moisture content, confinement (e.g., relatively soft bottom versus bedrock), etc. Thus, the maximum lift thickness can vary considerably and still achieve proper moisture content and relative compaction.

The maximum lift thickness should be appropriately decreased based on the factors listed above. It is left to a representative of GeoTek (e.g., grading/field technician) to determine the appropriate lift thickness based on observation and testing of the fill. Excessive lift thickness (in the judgment of a GeoTek representative) will result in issuing of non-compliance. A sufficient number of field density tests shall be performed to provide an opinion to the degree of compaction achieved. Field density tests should be performed at a minimum rate of one test for every 1,000 cubic yards of material placed, one for every vertical foot of material placed, or where there is a change in material, whichever is greater.

If needed, when testing the fill for dry density and moisture content, a pothole/test pit should be excavated to a minimum depth to remove any loose surficial material. The area should then be leveled prior to performing a density test. A failing soil density test is based on either a dry density of less than 95% relative compaction and/or moisture content less than the soil's required moisture content as determined by ASTM D-698.

Fill Material

Onsite soils may be used as general pipeline backfill material above the pipeline embedment zone. Onsite soils do not meet the requirements for pipeline embedment material. These materials will likely need to be imported.

General Pipeline Backfill:

On-site soils that are cleaned of organics, oversized material, and debris may be used as general pipeline backfill material above the embedment zone and structural fill beneath foundations/structural areas..

Pipeline Embedment Material:

Pipeline embedment material should comply with the pipe manufacturer and Maricopa Association of Governments pipeline bedding requirements (MAG). Per MAG, pipeline embedment materials should conform to the following minimum guidelines:

* Free of organic matter and debris.
* Maximum Plasticity Index of 5.
* 100 percent passing the 1.5-inch screen.
* 90 – 100 percent passing the 1-inch screen.
* 38 – 65 percent passing the No. 4 screen.
* 25 – 60 percent passing the No. 8 screen.
* 10 – 40 percent passing the No. 30 screen.
* 3 – 12 percent passing the No. 200 screen.

Observation and Testing

During earthwork construction, all removals/processing and the general grading procedures should be observed and the fill selectively tested by a representative(s) of GeoTek. If unusual or unexpected conditions are exposed in the field, they should be reviewed by GeoTek and if warranted, modified and/or additional recommendations will be offered. All applicable requirements both the local and national construction and general industry safety orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met.

Earthwork Settlements

Ground settlement should be anticipated due to primary consolidation and secondary compression. The total amount of settlement and time over which it occurs is dependent upon various factors, including material type, depth of fill, depth of removals, initial and final moisture content, and in-place density of subsurface materials. Compacted fills, to the heights anticipated, are not generally prone to excessive settlement. However, some settlement of the left in-place alluvium and colluvium is expected and the majority of this settlement is anticipated to occur during grading.

Excavation Difficulty

We present the following general comments regarding excavation conditions for the owners' and designers' information with the understanding that they are approximations based on widely spaced borings. More accurate information regarding the excavation conditions should be evaluated by contractors or other interested parties from boring excavations using the intended equipment and extending to the required depths. Boring explorations were advanced onsite to depths of up to 26 feet bgs. Based on the results of the explorations, shallow excavations should be possible with conventional excavating equipment. Deeper excavations extending more than 26 feet bgs and into the underlying soil could be difficult and may require special excavation equipment (i.e., hoe-ram, rock saw, large excavator). Instability in the form of slope raveling, caving, and sloughing is possible in excavations and trenches at the site. Excavations should be braced, sloped, and/or designed as required by OSHA Standards to provide personnel safety and satisfy safety code regulations.

Slope and Trench Stability

Considering the nature of earth materials and anticipated depth of excavation, shoring will be needed.

Where slopes are desired, the contractor should have the ability to flatten slopes on an as needed basis. This office should be contacted immediately if any evidence of instability is observed or develops at the site. Some minor sloughing and sliding may occur regardless of the slope gradient, and workers should be protected from these small failures during construction. This office should be retained to observe site excavation. The frequency of site visits will depend on the progress of the job through the various phases of excavation and construction. If equipment or construction materials are placed within 25 feet of the excavation, modified slope gradients and/or possible shoring recommendations will need to be evaluated.

Earthwork Balance

The volume change of excavated materials upon compaction as engineered fill is anticipated to vary with material type and location. It is anticipated that the alluvial and colluvial materials will subside approximately 0.025 to 0.075 feet due to soil consolidation and the loading conditions created by earthwork equipment. Graded areas are not anticipated to have significant subsidence due to earthwork.

Artificial Fill / Native Alluvium / Native Colluvium... 5% to 15% shrinkage

It should be noted that the above factors are estimates only, based on experience and preliminary data. Final earthwork balance factors could vary. In this regard, it is recommended that balance areas be reserved where grades could be adjusted up or down near the completion of grading in order to accommodate yardage imbalance for the project.

Soil Corrosion

Soils vary in corrosive potential to concrete and metal; therefore, materials selected for construction purposes should be resistant to corrosion as discussed below. Testing of on-site soils indicated sulfate contents of 620 ppm in the near surface soils, which may be characterized as negligible sulfate content (ACI 318 – less than 1,000 ppm). Type II cement or equivalent for negligible sulfate exposure conditions is acceptable for concrete mixtures. If any concrete is planned for development, all concrete should be designed, mixed, placed, finished, and cured in accordance with guidelines presented by the Portland Cement Association (PCA), the American Concrete Institute (ACI), and the International Building Code (IBC).

Testing of on-site soils indicate chloride contents of 290 ppm, which is below the typical limit of 500 ppm where protection of steel tendon is required in concrete slab-on-grade. The designer should use the corrosion test results in this report to evaluate the need for corrosion protection in accordance with ACI requirements. All concrete should be designed, mixed, placed, finished, and cured in accordance with guidelines presented by the Portland Cement Association (PCA), ACI, and IBC.

The minimum resistivity value of the analyzed soil sample was 520 ohm-cm.

Based on experience, the natural soils in the vicinity, especially when of elevated moisture content, are severely corrosive to buried ferrous metals. Special protection may be warranted for buried metal piping, underground retention tanks, or other conduits that would be in direct contact with the natural soils. In addition, special protection may be necessary where dissimilar metals are placed in close proximity or are joined. Consideration should be given to the use of approved non-metallic or coated conduits.

RECOMMENDATIONS – FOUNDATIONS

General

Foundation design and construction recommendations are based on laboratory testing and engineering analysis performed on near surface earth materials. If new foundation systems are proposed, they should be designed and constructed in accordance with the guidelines contained herein, local requirements, and the IBC. During earthwork, the as-graded expansive nature of the near surface soils within the graded structural areas should be determined. Provided our recommendations presented in this report are followed, we project the as-graded condition for the new foundations of the lift station to be low expansive. Appropriate expansive foundation and construction design recommendations should be provided, based on the as-graded soil conditions. For budget and design consideration it is our opinion the following foundation recommendations could be utilized, however, at the completion of earthwork, final foundation recommendations should be determined by GeoTek.

The information and recommendations presented below are not meant to supersede design by a registered structural engineer. Upon request, GeoTek could provide additional input/consultation regarding soil parameters related to foundation design.

At Depth Conventional Slab Foundation Recommendations

New foundations for the existing lift station structure may be supported on a conventional slab foundation provided the soils are reworked as outlined in this report and our recommendations are followed. Recommendations for foundation design and construction for low expansive soils are presented below. Minimum recommendations for foundation design and construction are presented below. The specific criteria to be used should be verified on evaluation of the proposed buildings, structural loads, and expansion testing performed after grading is complete.

The bearing values indicated are for the total dead plus frequently applied live loads and may be increased by one third for short duration loading which includes the effects of wind or seismic forces.

When combining passive pressure and friction for lateral resistance, the passive component should be reduced by one third. All reinforcement should be designed by the project's structural engineer. All footings should maintain a minimum horizontal distance of seven feet from the outside bottom edge of the footing to the face of an adjacent descending slope.

Foundation reinforcement should be designed by the project's structural engineer but should maintain a minimum of 0.017 steel to concrete ratio by the area.

Footing Type	Minimum Footing Width (inches)	Allowable Bearing Pressure (psf)	Coefficient of Friction	Passive Earth Pressure (psf/ft)	Maximum Earth Pressure (psf)
Strip/Spread	12	2,000	0.40	300	3,000

The new lift station slab foundation should be supported by a minimum 12-inches of structural fill material. In either wet or dry condition, the foundation should be directly underlain with a minimum 12-inch thickness of MAG Aggregate Base Course (ABC). The Aggregate Base Course can be considered structural fill material. The use of a vapor retarder should be determined by the designer.

If in a dry condition, a drainage system should be utilized to collect the accumulated water and prevent hydrostatic pressures. The drainage system should collect the accumulated water and either discharge to a daylight location or tie into an appropriate outlet. A sump pump should be provided, with a minimum 3-foot embedment below the lowest adjacent grade and be capable of removing any accumulated water with an adequately sized pump.

Uplift Pressures

For a dry environment, the proposed lift station should be designed appropriately to resist the uplift pressure from the buoyant forces. Upon request, GeoTek could provide additional consultation and recommendations regarding this matter once the design of the proposed lift station is finalized.

Lateral Earth Pressures

At the time of our field work, ground water was encountered at a depth of 25 feet bgs within both boring explorations. It should be noted that ground water depth may fluctuate over time, thus recommendations for both dry and wet conditions are provided. The recommendations for the appropriate condition should be utilized for design.

For dry conditions, the at-rest equivalent fluid pressure for restrained walls is 47 pounds per square foot per foot of depth plus any applicable surcharge loading. For wet conditions, the proposed lift station walls should be designed for a restrained condition with the at-rest equivalent fluid pressure of 47 pounds per square foot per foot of depth plus an additional 62.4 pounds per square foot per foot of depth to account for the hydrostatic pressures plus any applicable surcharge loading.

Foundation Settlement

Total settlement of the structure with foundations supported entirely on engineered fill is estimated to be less than 1 inch. Differential settlement should be less than one-half the total settlement.

Angular distortions should not exceed a two-way 1/360 distortion. The settlement estimates presented assume that a stable subgrade soil moisture content will be maintained and that fill soils are properly compacted. The two foundation systems for the existing lift station and new foundation additions should be expected to move differentially. Larger differential foundation loading could cause more severe angular distortions requiring more moment and shear resistance in the foundation system.

DEVELOPMENT CRITERIA

Site Improvements

Soil movement is problematic with respect to the design, construction, and long-term performance of concrete flatwork. Due to the nature of concrete flatwork, it is essentially impossible to totally mitigate the effects of soil movement. Recommendations for exterior concrete flatwork design and construction can be provided upon request. If, in the future, any additional improvements are planned for the site, additional recommendations concerning the geological or geotechnical aspects of design and construction of said improvements could be provided upon request. This office should be notified in advance of any fill placement, grading, or trench backfilling after rough grading has been completed. This includes any grading, utility trench, and retaining wall backfills.

Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of all earth materials. Graded slopes constructed within and utilizing onsite materials may be erosive.
Eroded debris may be reduced, and surficial slope stability enhanced by establishing and maintaining a suitable vegetation cover as soon as possible after construction. Compaction to the face of fill slopes would help to reduce short-term erosion until vegetation is established. Plants selected for landscaping should be lightweight, deep-rooted types, which require little water and are capable of surviving the prevailing climate. From a geotechnical standpoint, leaching is not recommended for establishing landscaping. If the surface soils are processed to adding amendments, they should be recompacted to 95 percent compaction (Based on ASTM D-698).

Only the minimum amount of irrigation necessary to sustain plant life should be provided. Over watering landscape areas could adversely affect proposed site improvements. We recommend that any proposed open bottom planter areas adjacent to the structure be eliminated or set back a minimum distance of five (5) feet and suggest that desert landscape using xeriscape technology is used outside of this buffer zone. As an alternative, closed bottom type planters could be utilized. An outlet, placed in the bottom of the planter, could be installed to direct drainage away from structures or any exterior concrete flatwork. Irrigation timers should be adjusted on a monthly basis in accordance with the local Water Authority/Water District's posted "Watering Schedule" for low use conditions.

PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

Final foundation and improvement plans should be submitted to this office for review and comment as they become available, to minimize any misunderstandings between the plans and recommendations presented herein. In addition, foundation excavations and earthwork construction performed on the site should be observed and tested by this office. If conditions are found to differ substantially from those stated, appropriate recommendations would be offered at that time. We recommend that site preparation and foundation construction activities be observed and tested by a representative of GeoTek. This representative would have at least the following duties:

- Observe and document adequate removal of existing surficial vegetation, artificial fill, disturbed native soils, debris, and other deleterious materials.
- Observe and approve the exposed removals under structural areas to document that it meets project requirements.
- Approve material used as engineered fill in structural areas and document that it meets project requirements.
- Monitor and test the progress of earthwork and compaction operations.

LIMITATIONS

The materials encountered on the project site and utilized in the referenced laboratory study are believed representative of the area; however, soil materials vary in character between excavations. Site conditions may vary due to seasonal changes or other factors.
Grading, trench backfilling and/or foundation construction procedures should be observed and selectively tested by a representative of GeoTek. If unusual or unexpected conditions are exposed in the field, they should be reviewed by this office and if warranted, modified and/or additional recommendations will be offered.

Since our study is based upon the site materials observed, selective laboratory testing and engineering analysis, the conclusions and recommendations are professional opinions. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

GeoTek assumes no responsibility or liability for work, testing, or recommendations performed or provided by others. If another party provides observation and testing during the earthwork phases of the project, the testing company must assume responsibility as the Geotechnical Engineer of Record by concurring with the findings and recommendations of this report or by providing amended recommendations and testing. This report is intended primarily for design purposes. However, if using this report as a bidding aid, the contractor should perform an independent assessment or make their own assumptions as of unforeseen subsurface conditions.

The opportunity to be of service is greatly appreciated. If you have any questions concerning this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Respectfully submitted,

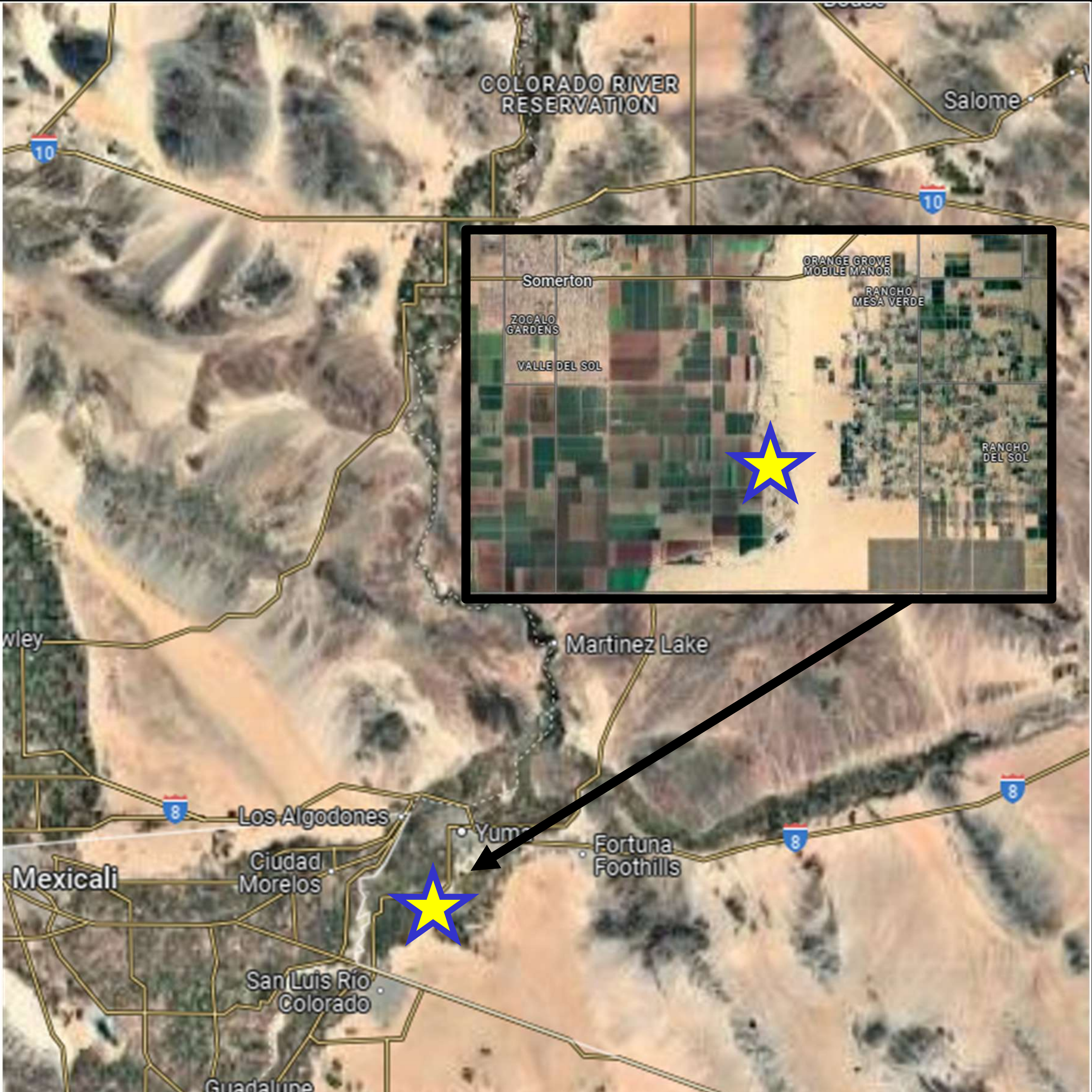
GeoTek, Inc.

Registered Professional Engineer (Civil)
CERTIFICATE NO.
78192
ALEXANDER
KOEHLER
Date Signed 2/12/26
ARIZONA, U.S.A.

Ashley Heeg

Ashley Heeg, E.I.
Staff Professional

Alex S. Koehler, P.E.
Professional Engineer



NOT TO SCALE

APPROXIMATE SITE LOCATION

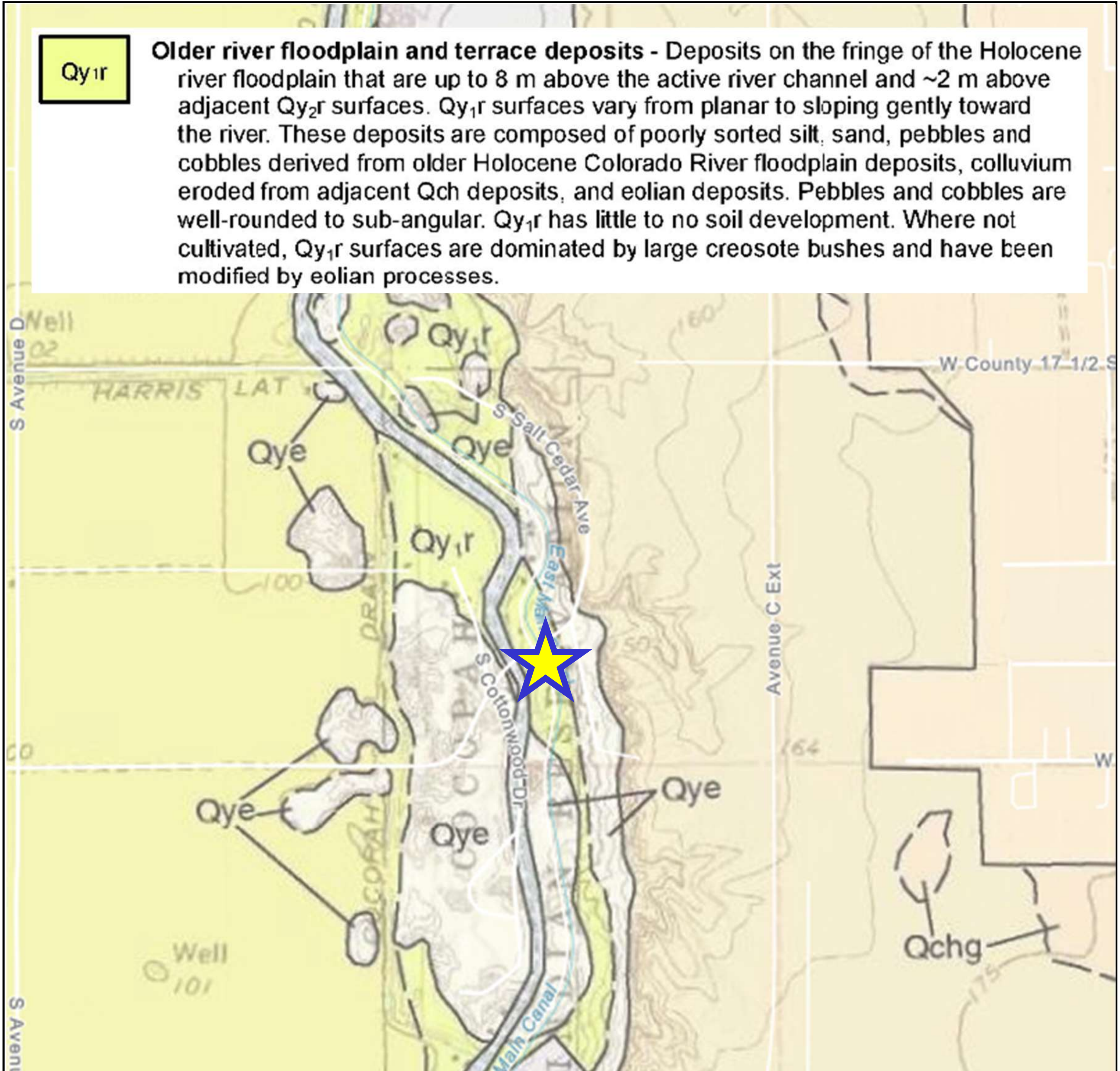
N

GeoTek, Inc.
4374 Alexander Blvd NE, Suite K2
Albuquerque, NM 87107

GEOTECHNICAL | ENVIRONMENTAL | MATERIALS

FIGURE 1
SITE LOCATION MAP
East Cocopah Sewer Lift Station
Cocopah Reservation, Somerton, Arizona
Prepared for: BAI Engineers

Project No.:	Report Date:	Drawn By:
2666-AB	February 2026	AH



*Legend Descriptions From Arizona Geological Survey

APPROXIMATE LIFT STATION LOCATION

NOT TO SCALE

N

GeoTek, Inc.
4374 Alexander Blvd NE, Suite K2
Albuquerque, NM 87107

GEOTECHNICAL ENVIRONMENTAL MATERIALS

FIGURE 2
REGIONAL GEOLOGY
East Cocopah Sewer Lift Station
Cocopah Reservation, Somerton, Arizona
Prepared for: BAI Engineers

Project No.:	Report Date:	Drawn By:
2666-ABR	February 2026	AH

APPROXIMATE GEOTEK BORING LOCATIONS

NOT TO SCALE

N

GeoTek, Inc.
4374 Alexander Blvd NE, Suite K2
Albuquerque, NM 87107

GEOTECHNICAL ENVIRONMENTAL MATERIALS

FIGURE 3
GEOTECHNICAL LOCATION MAP
East Cocopah Sewer Lift Station
Cocopah Reservation, Somerton, Arizona
Prepared for: BAI Engineers

Project No.:	Report Date:	Drawn By:
2666-AB	February 2026	AH

APPENDIX A

REFERENCES

International Code Council, Inc., 2018 International Building Code.

Artiola, J., & Uhlman, K. (2009). Arizona Well Owner's Guide To Water Supply

Youberg, A., 2011, Geologic map of the Somerton 7 1/2' Quadrangle, Yuma County, Arizona, Arizona Geological Survey, scale 1:24,000

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Day, Robert W., 1999, Geotechnical and Foundation Engineering – Design and Construction

Day, Robert W., 2002, Geotechnical Earthquake Engineering Handbook

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Earth Fissures, Subsidence & Karst in Arizona, Arizona Geological Survey

Occupational Safety and Health Administration (OSHA) Standards Subpart 1926 Subpart P: Excavations

Uniform Standard Specifications and Details for Public Works Construction, Maricopa Association of Governments, 2021

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USGS Website, Earthquake Hazards Program, Interpolated Probabilistic Ground Motion for the Conterminous 48 States by Latitude/Longitude, 2018 International Building Code Data Edition.

APPENDIX B

BORING LOG GENERAL NOTES

CONSISTENCY OF FINE-GRAINED SOILS		
Unconfined Compressive Strength, Qu, psf	**Standard Penetration or N-Value (SS) Blows/Ft**	**Consistency**
< 500	<2	Very Soft
500 - 1,000	2 - 3	Soft
1,001 - 2,000	4 - 7	Firm
2,001 - 4,000	8 - 16	Stiff
4,001 - 8,000	17 - 32	Very Stiff
> 8,001	32+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS	
Standard Penetration (SPT) or N-Value (SS) Blows/Ft	**Relative Density**
0 - 3	Very Loose
4 - 9	Loose
10 - 29	Medium Dense
30 - 49	Dense
50+	Very Dense

SPT penetration test using 140 pound hammer, with 30 inch free fall on 2 inch outside diameter(1-3/8 ID) sampler
For ring sampler using 140 lb hammer, with a 30 inch free fall on 3 inch outside diameter (2-1/2 ID) sample, use N-value x 0.636 to get Standard N-value
For fine grained soil consistency, thumb penetration used per ASTM D-2488

RELATIVE PROPORTIONS OF SAND AND GRAVEL	
Descriptive Term of other constituents	**Percent of Dry Weight**
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY	
Major Component of Sample	**Particle Size**
Boulders	Over 12 inches
Cobbles	3 inches to 12 inches
Gravel	#4 Sieve to 3 inches
Sand	#200 Sieve to #4 Sieve
Silt or Clay	Passing #200 Sieve

RELATIVE HARDNESS OF CEMENTED SOILS (CALICHE)	
Description	**General Characteristics**
Very Dense to Moderately Hard	Partially Cemented Granular Soil - Can be carved with a knife and broken with force by hand.
Very Stiff to Moderately Hard	Partially Cemented Fine-Grained Soil - Can be carved with a knife and broken with force by hand.
Moderately Hard	Moderate hammer blow required to break a sample
Hard	Heavy hammer blow required to break a sample
Very Hard	Repeated heavy hammer blow required to break a sample

MOISTURE CLASSIFICATION	
Description*	**Degree of Saturation**
Dry	0%
Slightly Moist	1% - 50%
Moist	51%-75%
Wet	76% - 99%
Saturated	100%

*Defined as Condition of Sand

BORING LOG LEGEND

MATERIAL DESCRIPTION		
Soil Pattern	**USCS Symbol**	**USCS Classification**
	FILL	Artificial Fill
	GP or GW	Poorly/Well graded GRAVEL
	GM	Silty GRAVEL
	GC	Clayey GRAVEL
	GP-GM or GW-GM	Poorly/Well graded GRAVEL with Silt
	GP-GC or GW-GC	Poorly/Well graded GRAVEL with Clay
	GC-GM	Silty Clayey GRAVEL
	SP or SW	Poorly/Well graded SAND
	SM	Silty SAND
	SC	Clayey SAND
	SP-SM or SW-SM	Poorly/Well graded SAND with Silt
	SP-SC or SW-SC	Poorly/Well graded SAND with Clay
	SC-SM	Silty Clayey SAND
	ML	SILT
	MH	Elastic SILT
	CL-ML	Silty CLAY
	CL	Lean CLAY
	CH	Fat CLAY
	PCEM	PARTIALLY CEMENTED
	CEM	CEMENTED
	BDR	BEDROCK

SAMPLING	
	SPT
	Ring Sample
NR	No Recovery
	Bulk Sample
	Water Table

CONSISTENCY							
Cohesionless Soils		**Cohesive Soils**		**Cementation**		**Bedrock**	
VL	Very Loose	So	Soft	MH	Mod. Hard	ESt	Extremely Strong
L	Loose	F	Firm	H	Hard	VSt	Very Strong
MD	Medium Dense	S	Stiff	VH	Very Hard	St	Strong
D	Dense	VS	Very Stiff			MSt	Moderately Strong
VD	Very Dense					W	Weak
						Fr	Friable

BORING LOG

GEOTEK

PROJECT #:	2666-AB	**LOGGED BY:**	AA
PROJECT:	East Cocopah Lift Station	**METHOD:**	H.S.A
CLIENT:	Bai Engineers	**OPERATOR:**	Integrity
LOCATION:	Somerton, AZ	**DATE:**	10/16/24

BORING NUMBER: B-1

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/Foot	SAMPLES: Soil Pattern	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Consistency	LABORATORY TESTING: Water Content (%)	LABORATORY TESTING: Dry Density (pcf)	LABORATORY TESTING: Swell (%)	LABORATORY TESTING: Plasticity Index
0–2				FILL	(SM) Artificial Fill, Brown Silty SAND with Gravel, Sl. Moist, Lt. Cementation	MD			0.1	NP
2–3		18		SM	Brown Silty SAND, Sl. Moist, Med. Dense, Lt. Cementation	MD	3	103		
5–6		18					3	96		
10–11		17					3	99		
15–16		22					1	101		
16.5					Increase in Sand					
19–21		16		SP-SM	Light Brown Poorly Graded SAND with Silt, Sl. Moist, Med. Dense, Lt. Cementation	MD	2	97		NP

Boring Continued on Next Page

BORING LOG

GEOTEK

PROJECT #:	2666-AB	LOGGED BY:	AA
PROJECT:	East Cocopah Lift Station	METHOD:	H.S.A
CLIENT:	Bai Engineers	OPERATOR:	Integrity
LOCATION:	Somerton, AZ	DATE:	10/16/24

BORING NUMBER: B-1 Continued

Depth (ft)	SAMPLES: Sample Type	SAMPLES: Blows/Foot	SAMPLES: Soil Pattern	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Consistency	LABORATORY TESTING: Water Content (%)	Dry Density (pcf)	Swell (%)	Plasticity Index
23 24				SP-SM	Lt. Brown Poorly Graded SAND with Silt, Sl. Moist, Med. Dense, Lt. Cementation	MD				
25		18			No Recovery, Groundwater Encountered, Saturated					
26					**Boring Ends at Approximately 26 Feet Depth** **Groundwater Encountered at Approximately 25 Feet Depth**					

BORING LOG

GEOTEK

PROJECT #: 2666-AB
PROJECT: East Cocopah Lift Station
CLIENT: Bai Engineers
LOCATION: Somerton, AZ

LOGGED BY: AA
METHOD: H.S.A
OPERATOR: Integrity
DATE: 10/16/24

BORING NUMBER: B-2

Depth (ft)	Sample Type	Blows/Foot	Soil Pattern	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Consistency	Water Content (%)	Dry Density (pcf)	Swell (%)	Plasticity Index
0–4				FILL	(SM) Artificial Fill, Brown Silty SAND, Sl. Moist, Lt. Cementation, Organics to 6"	D				
2–3		53					1	105		
4–12				SM	Brown Silty SAND, Sl. Moist, Med. Dense, Lt. Cementation	MD				
5–6		16					1	98		
10–11		18					1	99		
11–12					Increase in Sand					
12–21				SP-SM	Light Brown Poorly Graded SAND with Silt, Sl. Moist, Med. Dense, Lt. Cementation	MD				
12–14										NP
15–16		29					1	104		
20–21		16					3	98		

Boring Continued on Next Page

BORING LOG

GEOTEK

PROJECT #:	2666-AB	LOGGED BY:	AA
PROJECT:	East Cocopah Lift Station	METHOD:	H.S.A
CLIENT:	Bai Engineers	OPERATOR:	Integrity
LOCATION:	Somerton, AZ	DATE:	10/16/24

BORING NUMBER: B-2 Continued

Depth (ft)	SAMPLES: Sample Type	Blows/Foot	Soil Pattern	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Consistency	LABORATORY TESTING: Water Content (%)	Dry Density (pcf)	Swell (%)	Plasticity Index
				SP-SM	Lt. Brown Poorly Graded SAND with Silt, Sl. Moist, Med. Dense, Lt. Cementation	MD				
23										
24										
25		29			No Recovery, Groundwater Encountered, Wet					
26										
27										
28										
29										
30		5 15 4			No Recovery, Saturated					
31										

Boring Ends at Approximately 31.5 Feet Depth
Groundwater Encountered at Approximately 25 Feet Depth

APPENDIX C

LABORATORY TESTS RESULTS (2666-AB)

MOISTURE CONTENT AND IN SITU DRY DENSITY OF SOIL

Moisture content and in situ dry density tests were performed on samples of soil. The samples were weighed and dried back in a low temperature oven to determine the weight of the dried sample and moisture loss. The dry density was calculated using the known volume of the thin-walled brass ring sample. The percent moisture and dry density were then determined in accordance with ASTM D7263. The test results are presented on the exploration logs.

MAXIMUM DRY DENSITY AND OPTIMUM MOISTURE CONTENT

The maximum dry density and optimum moisture content of selected representative soil samples were evaluated using the Modified Proctor method in general accordance with ASTM D698. Test results are presented in the following pages.

PARTICLE SIZE ANALYSIS

Sieve analyses were performed in general accordance with ASTM test method C136 / C117. Test results are presented in the following plates.

ATTERBERG LIMITS

Atterberg limits were performed on representative samples in general accordance with AASHTO T89 and T90. Test results are shown in the following pages.

CHEMICAL TESTING (Sulfates, Chlorides, and Minimum Resistivity)

Testing was performed to determine the amount of water-soluble salt in representative samples of the soil. Individual test results denote the parts per million analytes soluble in water at a 1:5 (soil to water) extraction ratio. The samples were prepared and tested in accordance with EPA procedures. All chemical testing was performed by *Eurofins, Albuquerque (*Formerly *Hall Environmental Analysis Laboratory*). Test results are presented on the following pages.

GeoTek, Inc.
4374 Alexander Blvd NE Suite K-2, Albuquerque, NM 87107
(505) 456-4900Office (505) 456-4901Fax www.geotekusa.com

In-Situ Moisture/Density of Ring Samples

GeoTek Project No. 2666-AB

Client: Bai Engineers

Project: East Cocopah Lift Station

Sample Location	Sample Depth	Moisture (%)	Dry Density (lbf/ft^3)
B-1	2-3'	2.8	103.2
B-1	5-6'	2.9	96.1
B-1	10-11'	2.9	98.7
B-1	15-16'	0.7	101.4
B-1	20-21'	1.9	96.6
B-2	2-3'	1.2	104.9
B-2	5-6'	1.2	98.0
B-2	10-11'	1.1	99.2
B-2	15-16'	0.6	104.1
B-2	20-21'	3.1	98.0

GeoTek - New Mexico
4374 Alexander Blvd. NE
Suite K-2
Albuquerque, NM 87107
Phone: (505) 456-4900

Report No: MAT:24-01290-S01
Issue No: 1

Material Test Report

Client: Bai Engineers
ATTN: Xuehua Bai
Los Ranchos NM 87107

CC:

Project: 2666-AB
Cocopah Reservation Lift Station

Reviewed By: Alexander Koehler
(Staff Professional)
Date of Issue: 11/5/2024

Sample Details

Sample ID	24-01290-S01
Date Sampled	10/16/2024
Specification	Generic Sieve
Sampled By	Aaron Aguilar
Location	B-1, 19-21'

Other Test Results

Description	Method	Result	Limits
Liquid Limit (%)	AASHTO T 89	N/A	
Plastic Limit (%)	AASHTO T 90	NP	
Plasticity Index	AASHTO T 90	NP	
Group Symbol	ASTM D 2487	SP-SM	
Group Name	Poorly graded sand with silt		

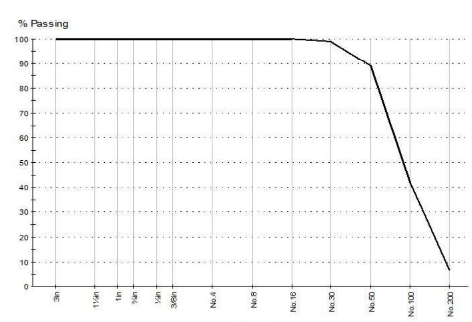
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
3in	100	
1½in	100	
1in	100	
¾in	100	
½in	100	
3/8in	100	
No.4	100	
No.8	100	
No.16	100	
No.30	99	
No.50	89	
No.100	42	
No.200	6.8	

Chart



Comments

NP = Non Plastic

GeoTek - New Mexico
4374 Alexander Blvd. NE
Suite K-2
Albuquerque, NM 87107
Phone: (505) 456-4900

Material Test Report

Report No: MAT:24-01290-S02
Issue No: 1

Client: Bai Engineers
ATTN: Xuehua Bai
Los Ranchos NM 87107

CC:

Project: 2666-AB
Cocopah Reservation Lift Station

Reviewed By: Alexander Koehler
(Staff Professional)
Date of Issue: 11/5/2024

Sample Details

Sample ID	24-01290-S02
Date Sampled	10/16/2024
Specification	Generic Sieve
Sampled By	Aaron Aguilar
Location	B-1, 0-3'

Other Test Results

Description	Method	Result	Limits
Swell (%)		0.1	
Liquid Limit (%)	AASHTO T 89	N/A	
Plastic Limit (%)	AASHTO T 90	NP	
Plasticity Index	AASHTO T 90	NP	
Group Symbol	ASTM D 2487	SM	
Group Name		Silty sand with gravel	
Maximum Dry Unit Weight (lbf/ft³)	ASTM D 698	107.3	
Corrected Maximum Dry Unit Weight (lbf/ft³)		107.3	
Optimum Water Content (%)		8.6	
Corrected Optimum Water Content (%)		8.6	
Method		A	
Rammer Type		6-27	

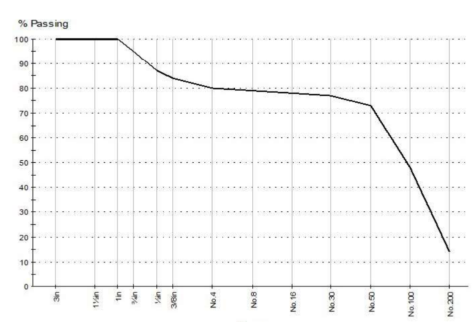
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
3in	100	
1½in	100	
1in	100	
¾in	95	
½in	87	
3/8in	84	
No.4	80	
No.8	79	
No.16	78	
No.30	77	
No.50	73	
No.100	48	
No.200	14	

Chart



Comments

NP = Non Plastic

GeoTek - New Mexico
4374 Alexander Blvd. NE
Suite K-2
Albuquerque, NM 87107
Phone: (505) 456-4900

Material Test Report

Report No: MAT:24-01290-S03
Issue No: 1

Client: Bai Engineers
ATTN: Xuehua Bai
Los Ranchos NM 87107

CC:

Project: 2666-AB
Cocopah Reservation Lift Station

AASHTO ACCREDITED

Reviewed By: Alexander Koehler
(Staff Professional)
Date of Issue: 11/5/2024

Sample Details

Sample ID	24-01290-S03
Date Sampled	10/16/2024
Specification	Generic Sieve
Sampled By	Aaron Aguilar
Location	B-2, 12-14'

Other Test Results

Description	Method	Result	Limits
Liquid Limit (%)	AASHTO T 89	N/A	
Plastic Limit (%)	AASHTO T 90	NP	
Plasticity Index	AASHTO T 90	NP	
Group Symbol	ASTM D 2487	SP-SM	
Group Name	Poorly graded sand with silt		

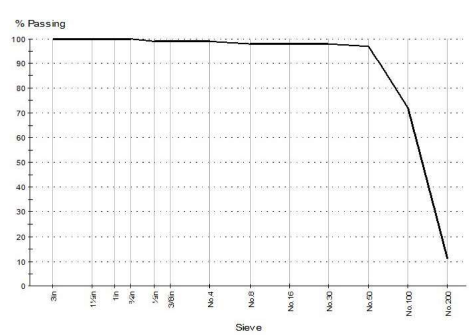
Particle Size Distribution

Method: ASTM C 136, ASTM C 117

Date Tested:
Tested By:

Sieve Size	% Passing	Limits
3in	100	
1½in	100	
1in	100	
¾in	100	
½in	99	
3/8in	99	
No.4	99	
No.8	98	
No.16	98	
No.30	98	
No.50	97	
No.100	72	
No.200	11	

Chart



Comments

NP = Non Plastic

GeoTek - New Mexico
4374 Alexander Blvd. NE
Suite K-2
Albuquerque, NM 87107
Phone: (505) 456-4900

Proctor Report

Report No: PTR:24-01290-S02
Issue No: 1

Client: Bai Engineers
ATTN: Xuehua Bai
Los Ranchos NM 87107

CC:

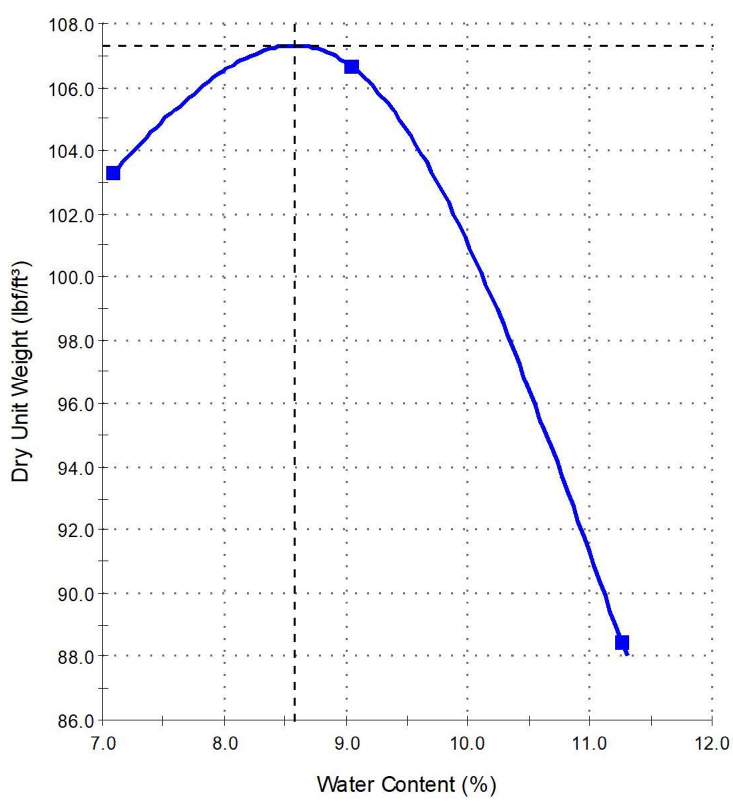
Project: 2666-AB
Cocopah Reservation Lift Station

Reviewed By: Alexander Koehler
(Staff Professional)
Date of Issue: 11/5/2024

Sample Details

Sample ID: 24-01290-S02
Date Sampled: 10/16/2024
Sampled By: Aaron Aguilar
Specification: Generic Sieve
Location: B-1, 0-3'

Dry Unit Weight - Water Content Relationship



Test Results

ASTM D 698

Maximum Dry Unit Weight (lbf/ft³):	**107.3**
Optimum Water Content (%):	**8.6**
Method:	A
Preparation Method:	
Rammer Type:	6-27
Tested By:	
Date Tested:	

AASHTO T 89/T 90

Liquid Limit (%):	N/A
Plastic Limit (%):	NP
Plasticity Index (%):	NP
Tested By:	
Date Tested:	

Comments

NP = Non Plastic

END OF ADDENDUM #2