NATIONAL MEMORIAL CEMETERY OF ARIZONA
GRAVESITE EXPANSION AND CEMETERY
IMPROVEMENTS

VA PROJECT NO. 914CM3009

CITY OF PHOENIX, MARICOPA COUNTY, ARIZONA

Delineation of Jurisdictional Waters

Prepared For:

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September 2015
JN: 147391
The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional “waters of the United States” (including wetlands) determination for the above-referenced project.

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Biologist
Natural Resources

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September 2015
JN: 147391
Executive Summary

Michael Baker International has prepared this Delineation of Jurisdictional Waters for the National Memorial Cemetery of Arizona Gravesite Expansion and Cemetery Improvements Project located in the City of Phoenix, Maricopa County, Arizona. The delineation documents the regulatory authority of the U.S. Army Corps of Engineers Los Angeles District (Corps) and the Arizona Department of Environmental Quality (ADEQ) pursuant to Sections 404 and 401 of the Federal Clean Water Act (CWA), respectively.¹

Four (4) unnamed drainage features (Drainage 1, 2, 3, and 4) occur within the boundaries of the project site. Drainages 1, 2, 3, and 4 possess a hydrologic connection to the Hayden-Rhodes Aqueduct and are ultimately tributary to the Salt and Gila Rivers. Therefore, Drainages 1, 2, 3, and 4 qualify as waters of the United States and fall under the regulatory authority of the Corps. Refer to Table ES-1 for a summary of Corps/ADEQ jurisdictional areas and project related impacts.

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Based on a review of site conditions and conceptual layout plans, the United States Department of Veterans Affairs must obtain the following regulatory approvals prior to the discharge of dredged or fill material into Corps jurisdictional areas: CWA Section 404 Nationwide Permit No. 39: Commercial and Institutional Developments, and CWA Section 401 Water Quality Certification. Refer to Sections 1 – 7 for a detailed analysis of site conditions and recommendations.

¹ The project site was surveyed on June 24 and June 25, 2015 pursuant to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008); the Practices for Documenting Jurisdiction under Section 404 of the CWA Regional Guidance Letter (Corps 2007); and Minimum Standards for Acceptance of Preliminary Wetland Delineations (Corps 2001).
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Section 1 Introduction and Purpose

This report contains the findings of Michael Baker International’s (Michael Baker) Delineation of Jurisdictional Waters for the National Memorial Cemetery of Arizona Gravesite Expansion and Cemetery Improvements Project (Project) located in the City of Phoenix, Maricopa County, Arizona (project site). The field work for this delineation of jurisdictional waters, including wetlands, was conducted by Michael Baker biologists Thomas C. Millington, Travis J. McGill, and Ryan S. Winkleman on June 24 and June 25, 2015. This report documents the findings made by Michael Baker, and explains the methodology used to define the jurisdictional authority of the U.S. Army Corps of Engineers Los Angeles District (Corps) and Arizona Department of Environmental Quality (ADEQ) pursuant to Sections 404 and 401 of the Federal Clean Water Act (CWA), respectively. This report presents our best effort at determining the jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Ultimately the Corps makes the final determination of jurisdictional boundaries.

1.1 PROJECT LOCATION

The project site is generally located north of State Route 101 and east of Interstate 17 in the City of Phoenix, Maricopa County, Arizona (Exhibit 1, Regional Vicinity). The project site is depicted on the Union Hills quadrangle of the United States Geological Survey’s (USGS) 7.5-minute topographic map series in Section 13 of Township 4 north, Range 3 east (Exhibit 2, Site Vicinity). Specifically, the project site is located south of Pinnacle Peak Road, west of North Black Mountain Parkway, north of East Deer Valley Road, and immediately east of the existing National Memorial Cemetery of Arizona (Exhibit 3, Project Site).

1.2 PROJECT DESCRIPTION

The United States Department of Veterans Affairs (VA) is proposing to implement the Master Plan which includes improvements to the existing cemetery facilities and to expand by developing and operating and maintaining the undeveloped 104 acres adjacent to and east of the existing cemetery site. Please refer to Exhibits 4A thru 4C for depictions of conceptual layout plans. As part of the master planning process the VA evaluated the physical, operational, and site-specific requirements of the proposed Project, as well as cost, environmental issues, and other factors. The proposed Project would provide approximately 11,000 additional interment sites for the National Memorial Cemetery of Arizona (NMCA), consisting of approximately 3,400 preplaced gravesite casket crypts, 300 gravesites for casket interments, 4,600 columbarium niches, and 2,700 in-ground cremation gravesites. Services would continue to take place at five existing committal service shelters on the site. Up to 30 ceremonies would occur on Mondays and Fridays and about 5 to 10 services per day on Tuesdays, Wednesdays, and Thursdays between the hours of 8:00 am and 3:00 pm, with occasional services on the
Project Location

Source: ESRI National Geographic Basemap
Existing Cemetery Project Site

Site Vicinity

Site Vicinity Miles

Exhibit 2

Source: ESRI World Topographic Basemap
weekends. There are no new service shelters, where ceremonies will be conducted in the expansion area.

Operations and maintenance would be included as part of the proposed Project and would consist of similar activities as currently conducted for the existing developed cemetery. Each national cemetery is managed by VA National Cemetery Administration (NCA) personnel in conformance with national and regional policies, priorities, goals, and objectives. Typical operation activities include burial of veterans and eligible family members, the interment of cremated remains, and the placement and maintenance of a headstone or grave marker. Cemetery operations include conducting Memorial Day and other special ceremonies, as well as the care of the graves, structures and grounds. Operating hours for the cemetery are Monday through Friday, 8:00 am – 4:30 pm. Maintenance activities include trimming and replanting of trees, shrubs, or cacti as needed, trash and debris removal, cleaning and repainting of buildings and structures/amenities as needed, irrigation repair, cleaning and repair of storm drain basins and channels and maintenance of roads, parking and fencing.

The proposed Project would also include construction of access roads, signage, site furnishings, fencing, and irrigation consistent with the existing cemetery as well as an Honor Guard Lounge. The proposed Project includes renovation and expansion of the administration building, improvements to the maintenance building, and improvements to the existing drainage channels and basins.

**Access Roads**

Existing roadways will be prioritized for repair and re-sealing, and will be extended into the 104 undeveloped acres to provide vehicular and pedestrian access to new interment sites. The accessible roads will be wide enough for parallel parking pull-offs at new buildings and columbaria. An additional entrance will be added off of Black Mountain Parkway. This additional entrance would be used for NMCA Operations and Maintenance access and may also be used for public access.

**Utilities**

Existing utilities will be extended for the development of the 104 acres. The existing administration building, maintenance complex, and public information center will have new connections to the municipal potable water source located in Pinnacle Peak Road.

**Signage**

Sign panels throughout the cemetery will be replaced as and where needed. With implementation of the Master Plan, some revisions to existing signs are necessary. New
Introduction and Purpose

signage will be included throughout the proposed expansion area for directional support for visitors of the 104-acre development.

Site Furnishings
Support the development of the 104 acres by locating new furnishing sites, which would consist of benches, trash receptacles, flower vase receptacles, and water spigots.

Fencing
The existing steel fence with stone pilasters will be extended following the cemetery boundary along Pinnacle Peak Road. An automatic gate will be integrated on Pinnacle Peak Road to secure the main entrance to the cemetery when closed.

Irrigation
New irrigation circuits will be provided as necessary to new planting areas that must provide sufficient water to promote healthy plant life.

Renovation and Expansion of Administration Building
A renovation and expansion for the existing administration building will be completed to meet operational and space requirements. The building expansion will address the space deficiencies in the existing administration building with respect to having a cemetery with a full administrative staff of seven individuals to support an average of fourteen interments per day. The Master Plan identifies any roof leaks, interior finishes for floors, walls and ceilings, casework, and other finishes or improvements that are needed to bring the structure within current codes, NCA operational standards, and VA or Federal mandates for sustainability and energy and water consumption.

Maintenance Building Improvements
Improvements will be made to the Maintenance Complex to address square foot requirements and space deficiencies in the existing maintenance complex by functional area. The expansion and renovation may consist with the following: adding office space, cantilevered roof structure over the above-ground fuel storage tanks, replacing the pre-engineered metal buildings and bringing structure(s) to comply with current codes and VA or Federal mandates for sustainability, energy, and water consumption. The improvements also address environmental regulatory requirements by plugging a drain in the Maintenance Building to prevent discharge into drainage channels and provide an oil and water separator for the wash bay.
**Honor Guard Lounge**

An Honor Guard Lounge will be constructed, either as a free standing structure, integrated within the maintenance complex, or other location that is suitable with cemetery operations.
Section 2 Regulations

The Corps Regulatory Division regulates activities pursuant to Section 404 of the CWA, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. In Arizona, the ADEQ regulates activities pursuant to Section 401 of the CWA.

2.1 U.S. ARMY CORPS OF ENGINEERS

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps and EPA define “fill material” to include any “material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States.” Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and “materials used to create any structure or infrastructure in the waters of the United States.” The terms waters of the United States and wetlands are defined under CWA Regulations 33 Code of Federal Regulations (CFR) §328.3 (a) through (b) and Appendix B of this report.

2.2 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit (e.g., CWA Section 404 permit) to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps ensure that federal actions will not violate water quality standards of the State or Indian tribe. In Arizona, the ADEQ can certify, conditionally certify, waive, or deny an application for CWA Section 401 Water Quality Certification to ensure that a project will not violate surface water quality standards or adversely impact impaired waters, and that it complies with applicable water quality improvement plans.
Section 3  Methodology

The analysis presented in this document is supported by field surveys and verification of site conditions conducted on June 24 and 25, 2015. Michael Baker biologists Thomas C. Millington, Travis J. McGill, and Ryan S. Winkleman conducted a site investigation to determine the jurisdictional limits of “waters of the United States,” including potential wetlands, located within the boundaries of the project site. Temperatures during the site visits averaged 110 degrees Fahrenheit with light winds and little to no cloud cover. While in the field, jurisdictional features were recorded on an aerial base map at a scale of 1" = 50' using topographic contours and visible landmarks as guidelines. A Garmin Map62 Global Positioning System was used to record and identify specific widths/lengths of ordinary high water mark (OHWM) indicators and the locations of photograph points, soil pits, and other pertinent jurisdictional features, if present. This data were then transferred as a .shp file and added to the Project's jurisdictional exhibit. The jurisdictional exhibit was prepared using ESRI ArcInfo Version 10 software. Michael Baker encountered no limitations during the field investigations.

3.1  WATERS OF THE UNITED STATES

In the absence of adjacent wetlands, the limits of the Corps jurisdiction in non-tidal waters extend to the OHWM, which is defined as “ . . . that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”2 Indicators of an OHWM are defined in A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Corps 2008). The limits of the OHWM can be determined by the observation of a natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; presence of litter and debris; wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; sediment deposition; multiple observed flow events; bed and banks; water staining/saturation; and/or changes in plant community.

3.2  WETLANDS

Pursuant to the Corps Wetland Delineation Manual (Corps 1987), the identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of these three parameters. For this geographic location,

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2  CWA regulations 33 CFR §328.3(e).
Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008).
Section 4  Literature Review

Michael Baker conducted a thorough review of relevant literature and materials to preliminarily identify areas that may fall under the jurisdiction of the Corps. A summary of materials utilized during the literature review is provided below and in Appendix C. In addition, refer to Section 8 for a complete list of references used throughout the course of this delineation.

4.1  SALT WATERSHED

The project site is located within the Salt Watershed (Hydrologic Unit Code 15060106), specifically the Lower Salt River subwatershed, which includes the waters and drainage basins of the Salt River from Theodore Roosevelt Dam (upper Apache Lake) downstream to the confluence with the Gila River. The watershed is approximately 6,243 square miles and extends from the New Mexico border near Mt. Baldy (11,420 feet above mean sea level [msl]) to the confluence of the Verde and Salt Rivers (1,397 feet above msl). The watershed is divided into six subwatersheds: Black River, White River, Upper Salt River, Carrizo Creek, Tonto Creek, and the Lower Salt River.

There are four lakes or reservoirs that have been identified in the Salt Watershed, with Theodore Roosevelt Lake (18,594 acres) being the largest, followed by Apache Lake (2,191 acres), Saguaro Lake (1,022 acres), and Canyon Lake (448 acres). Major streams within the watershed include the Salt River (239 miles), Tonto Creek (122 miles), Black River (122 miles), Carrizo Creek (63 miles), Cherry Creek (61 miles), Canyon Creek (52 miles), and the North Fork of the White River (51 miles). In the State of Arizona, the ADEQ has recognized certain outstanding resource surface waters as Outstanding Arizona Waters. Within the Salt Watershed, six surface waters have been classified by the ADEQ as Outstanding Arizona Waters: Bear Wallow Creek, South Fork of Bear Wallow Creek, North Fork Bear Wallow Creek, Hay Creek, Snake Creek, and Stinky Creek.

4.2  LOCAL CLIMATE

Maricopa County, like the Sonoran Desert in general, features a monsoon-based climate with dry springs and comparatively rainy summers, falls, and winters. Climatological data obtained for the City of Phoenix indicates the annual precipitation averages 8.29 inches per year. Because the Sonoran Desert experiences summer rains, most months of the year (i.e. those within summer, fall, and winter) receive high precipitation relative to the dry spring season. Almost all of the precipitation occurs in the months between July and March, with hardly any occurring between the months of April and June. The wettest month is March, with a monthly average total precipitation of 1.07 inches, while the driest is June, with a monthly average of 0.09 inch. The average maximum and minimum temperatures for the City of Phoenix are 107
and 44 degrees Fahrenheit respectively with July being the hottest month and December being the coldest. Temperatures during the site visits averaged 110 degrees Fahrenheit with light winds and little to no cloud cover.

### 4.3 USGS TOPOGRAPHIC QUADRANGLE

The project site is located within the Union Hills quadrangle of the USGS 7.5-minute topographic map series in Section 13 of Township 4 north, Range 3 east. Surface elevations within the project site range from approximately 1,584 to 1,621 feet above msl and gently slope from northeast to southwest. According to the topographic map, the project site is comprised entirely of vacant/undeveloped land. One (1) intermittent drainage feature is depicted on the central portion of the project site and follows on-site topography to the southwest. No additional drainages, wetlands, ponds, detention basins, or gravel pits are depicted on the topographic map.

### 4.4 AERIAL PHOTOGRAPHS

Prior to the field visit, Michael Baker reviewed current and historical aerial photographs (1997 – 2014) of the project site as available from Google Earth Pro Imaging (Version 7.1.2.2041). Aerial photographs can be useful during the delineation process, as the photographs often indicate the presence or absence of drainage features, flow patterns, ponded areas, and variations in plant communities on or within the immediate vicinity of the project site.

1997 – 2014: According to aerial photographs ranging in date from 1997 through 2014, the project site appears to consist primarily of vacant/undeveloped land. Pinnacle Peak Road is located to the north and Black Mountain Parkway runs along the eastern boundary of the project site. Various unimproved dirt roads traverse the project site and evidence of human use (i.e. grading, debris stockpiling) is prevalent throughout the western portions of the site. One (1) above-ground water storage tank and associated infrastructure is located in the northeast corner of the project site. In addition, multiple ephemeral drainage features traverse the project site and appear to follow site topography towards the southwest. Based on the 1997 historical aerial, the construction of Pinnacle Peak Road, Black Mountain Parkway, and the adjacent NMCA have altered, if not eliminated the historic hydrologic regime that once connected the project site to upstream drainage features or water sources. This is further evident in subsequent aerials, as many of the drainage features appear to become less defined and visible. Surrounding land uses consist of the existing NMCA, equestrian training facilities, surface roadways, and vacant/undeveloped land.
4.5 SOIL SURVEY

Soils within and adjacent to the project site were researched prior to the field visit using the U.S. Department of Agriculture (USDA), Soil Conservation Service, the Natural Resources Conservation Service (NRCS), and Custom Soil Resource Report for Aguila-Carefree Area, Arizona, Parts of Maricopa and Pinal Counties. The presence of hydric soils is initially investigated by comparing the mapped soil series for the site to the County list of hydric soils. Data from soil surveys is used to create soil maps and interpretations that were originally used to provide technical assistance to farmers and ranchers; to guide other decisions about soil selection, use, and management; and to assist in planning, research, and ultimately disseminating the results of the research. In addition, soil surveys are now heavily utilized in order to obtain soil information with respect to potential wetland environments and jurisdictional areas (e.g. soil characteristics, drainage, and color). According to the Custom Soil Resource Report, the project site is underlain by the following soil units: Gilman loams (55); Momoli gravelly sandy loam, 1 to 5 percent slopes (90); and the Tremant-Rillito complex (118). All on-site soil series are well drained and derived from mixed alluvium. Refer to Exhibit 5 for a depiction of on-site soil series.

4.6 HYDRIC SOILS LIST OF ARIZONA

Michael Baker reviewed the Hydric Soils List of Arizona (March 2014), provided by the NRCS, in an effort to verify whether or not on-site soils are considered to be hydric. It should be noted that lists of hydric soils and soil survey maps provide off-site ancillary tools to assist with wetland determinations, but are not a substitute for on-site investigations. According to the hydric soils list, none of the on-site soil types have been listed as hydric in Arizona.

4.7 NATIONAL WETLANDS INVENTORY

Michael Baker reviewed the U.S. Fish and Wildlife Service’s National Wetland Inventory maps. No wetland features have been documented within the project site. Refer to Appendix C, Documentation.

4.8 FLOOD ZONE

Michael Baker searched the Federal Emergency Management Agency website for flood data for the project site. Based on Flood Insurance Rate Map No. 04013C1285L, the project site is located within Zone X, or areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood. Refer to Appendix C, Documentation.
Legend

- **Project Site**
- Gilman loams
- Momoli gravelly sandy loam, 1 to 5 percent slopes
- Tremant-Rillito complex

Source: NRCS Web Soil Survey, Google Earth 2015

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Soils

Exhibit 5
Section 5 Site Conditions

The project site is relatively flat and consists of vacant/undeveloped land with the exception of various areas that have been exposed to vegetation clearing and material stockpiling activities associated with the existing NMCA facility to the west. In addition, evidence of illegal off-road vehicle use and multiple unimproved dirt roads are present throughout a majority of the project site. The project site primarily supports a Sonoran desert scrub plant community dominated by creosote bush (*Larrea tridentata*, UPL) and triangleleaf bursage (*Ambrosia deltoidea*, UPL). Drainage of the project site is accomplished via overland sheetflow and follows on-site topography towards the southwest. Four (4) unnamed, ephemeral drainage features and several non-jurisdictional erosional features (i.e., rills, roadside ditches) were observed throughout the project site. It is assumed that the construction of Pinnacle Peak Road, Black Mountain Parkway, and the adjacent NMCA has altered, if not eliminated the historic hydrologic regime that once connected the project site to upstream drainage features or water sources. As a result, flows within on-site drainage features are provided by direct precipitation and sheetflow runoff from surrounding upland areas. Refer to Appendix A for representative photographs of the project site and all jurisdictional drainage features documented within the boundaries of the project site.

5.1 DRAINAGE FEATURES

5.1.1 DRAINAGE 1 (D-1)

Drainage 1 is an unnamed, ephemeral drainage feature on the western portion of the project site. During significant storm events, surface water run-off from the surrounding upland areas and Pinnacle Peak Road to the north is directed to Drainage 1 and conveyed off-site to the south. Within the boundaries of the project site, Drainage 1 measures approximately 1,788 linear feet in length and consists of an earthen streambed composed of fine sediment and gravel. Evidence of a Corps OHWM and surface hydrology was observed along Drainage 1 via the following indicators: scour, drift/debris, sediment deposition, observation of a clearly defined bed/bank, changes in terrestrial vegetation, and drainage patterns. Drainage 1 is relatively unvegetated with the exception of a few plant species that have established along the drainage invert and banks. Plant species occurring within and adjacent to Drainage 1 include creosote bush, triangleleaf bursage, desert ironwood (*Olneya tesota*, UPL), blue palo verde (*Parkinsonia florida*, UPL), and honey mesquite (*Prosopis glandulosa*, UPL). No surface water, ponded areas, hydrophytic vegetation, or general wetland indicators were observed within or adjacent to Drainage 1.
5.1.2 DRAINAGE 2 (D-2)

Drainage 2 is an unnamed, ephemeral drainage feature on the southwest portion of the project site. During significant storm events, surface water run-off from surrounding upland areas is directed to Drainage 2 and conveyed southwest to Drainage 1 along the southern boundary of the project site. Within the boundaries of the project site, Drainage 2 measures approximately 527 linear feet in length and consists of an earthen streambed composed of fine sediment and gravel. Evidence of a Corps OHWM and surface hydrology was observed along Drainage 2 via the following indicators: scour, drift/debris, sediment deposition, observation of a clearly defined bed/bank, changes in terrestrial vegetation, and drainage patterns. Drainage 2 is relatively unvegetated with the exception of a few plant species that have established along the drainage invert and banks. Plant species occurring within and adjacent to Drainage 2 include creosote bush, triangleleaf bursage, desert ironwood, blue palo verde, and honey mesquite. No surface water, ponded areas, hydrophytic vegetation, or general wetland indicators were observed within or adjacent to Drainage 2.

5.1.3 DRAINAGE 3 (D-3)

Drainage 3 is an unnamed, ephemeral drainage feature on the southwest portion of the project site. During significant storm events, surface water run-off from surrounding upland areas and Pinnacle Peak Road is directed to Drainage 3 and conveyed off-site to the southwest towards Drainage 1. Within the boundaries of the project site, Drainage 3 measures approximately 2,222 linear feet in length and consists of an earthen streambed composed of fine sediment and gravel. Evidence of a Corps OHWM and surface hydrology was observed along Drainage 3 via the following indicators: scour, drift/debris, sediment deposition, observation of a clearly defined bed/bank, changes in terrestrial vegetation, and drainage patterns. Drainage 3 is relatively unvegetated with the exception of a few plant species that have established along the drainage invert and banks. Plant species occurring within and adjacent to Drainage 3 include creosote bush, triangleleaf bursage, desert ironwood, blue palo verde, and honey mesquite. No surface water, ponded areas, hydrophytic vegetation, or general wetland indicators were observed within or adjacent to Drainage 3.

5.1.4 DRAINAGE 4 (D-4)

Drainage 4 is an unnamed, ephemeral drainage feature on the southeast portion of the project site. During significant storm events, surface water run-off from surrounding upland areas is directed to Drainage 4 and conveyed off-site towards the southwest. Within the boundaries of the project site, Drainage 4 measures approximately 995 linear feet in length and consists of an earthen streambed composed of fine sediment and gravel. Evidence of a Corps OHWM and surface hydrology was observed along Drainage 4 via the following indicators: scour, drift/debris, sediment deposition, observation of a clearly defined bed/bank, changes in terrestrial vegetation, and drainage patterns. Drainage 4 is relatively unvegetated with the
exception of a few plant species that have established along the drainage invert and banks. Plant species occurring within and adjacent to Drainage 4 include creosote bush, triangleleaf bursage, desert ironwood, blue palo verde, and honey mesquite. No surface water, ponded areas, hydrophytic vegetation, or general wetland indicators were observed within or adjacent to Drainage 4.

5.2 WETLAND FEATURES

In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of the three wetland parameters described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008). Based on the results of the field investigation, no areas or portions of the on-site drainage features met all three wetland parameters. Further, no ponded areas or hydrophytic vegetation was observed. Therefore, no wetland features occur on the project site.
Section 6  

Findings

This delineation has been prepared in order to document the jurisdictional authority of the Corps within the boundaries of the project site. This report presents Michael Baker’s best effort at determining the extent of jurisdictional features using the most up-to-date regulations, written policy, and guidance from the Corps. However, as with any jurisdictional delineation, only the Corps can make a final determination of jurisdictional boundaries.

6.1  

U.S. ARMY CORPS OF ENGINEERS

6.1.1  

WATERS OF THE UNITED STATES DETERMINATION

Drainages 1, 2, 3, and 4 possess a hydrologic connection to the Hayden-Rhodes Aqueduct and are ultimately tributary to the Salt and Gila Rivers. As such, Drainages 1, 2, 3, and 4 qualify as waters of the United States and fall under the regulatory authority of the Corps. Therefore, approximately 0.27 acre (5,531 linear feet) of Corps non-wetland waters is located within the boundaries of the project site (Exhibit 6, Corps Jurisdiction). It should also be noted that Drainages 1, 2, 3, and 4 are not tributary to any surface water identified as a 303[d]-listed Impaired Water, Outstanding Arizona Water, or lake. Please refer to Table 1 for a summary of Corps/ADEQ jurisdictional areas and project related impacts.

Table 1:  

Corps/ADEQ Jurisdictional Areas and Impact Summary

<table>
<thead>
<tr>
<th>Corps/ADEQ Jurisdictional Drainage Feature</th>
<th>Non-Wetland Waters</th>
<th>Permanent Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acreage</td>
<td>Linear Feet</td>
</tr>
<tr>
<td>Drainage 1 (D-1)</td>
<td>0.08</td>
<td>1,788</td>
</tr>
<tr>
<td>Drainage 2 (D-2)</td>
<td>0.01</td>
<td>527</td>
</tr>
<tr>
<td>Drainage 3 (D-3)</td>
<td>0.14</td>
<td>2,222</td>
</tr>
<tr>
<td>Drainage 4 (D-4)</td>
<td>0.04</td>
<td>995</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>0.27</strong></td>
<td><strong>5,531</strong></td>
</tr>
</tbody>
</table>

6.1.2  

WETLAND DETERMINATION

In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of the three wetland parameters described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008). Based on the results of the field investigation, no areas or portions of the on-site drainage features met all three wetland parameters. Further, no ponded areas or hydrophytic vegetation was observed. Therefore, no wetland features occur on the project site.
Section 7 Conclusion and Recommendations

The Corps and ADEQ regulate the discharge of dredged or fill materials into waters of the United States, including wetlands, pursuant to Sections 404 and 401 of the CWA, respectively. Based on Michael Baker’s review of the site conditions and conceptual layout plans, the proposed Project will result in the discharge of fill material to waters of the United States.

7.1 U.S. ARMY CORPS OF ENGINEERS

The Corps regulates discharges of dredged or fill materials into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. Based on a review of conceptual layout plans, it will be necessary for the VA to acquire a CWA Section 404 permit prior to impacts occurring within Corps jurisdictional areas. As the proposed Project is anticipated to result in the permanent loss of less than 0.5 acre of Corps non-wetland waters, it is anticipated that the proposed Project can be authorized via a Nationwide Permit (NWP), specifically NWP No. 39: Commercial and Institutional Developments. The Corps requires the formal submittal of a pre-construction notification to review the proposed Project for consistency and ensure coverage under this NWP.

The Project will result in the permanent loss of approximately 0.27 acres of non-wetland waters of the U.S. Therefore, the VA will be required to mitigate jurisdictional impacts at no less than a 1:1 ratio through a Corps approved in-lieu fee program.

7.2 ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

Pursuant to Section 401 of the CWA, the State of Arizona requires Water Quality Certification for any activity or project that requires a federal permit (i.e. CWA Section 404 permit) that may result in discharge to waters of the United States. However, the ADEQ requires an Individual CWA Section 401 Water Quality Certification when a project has the potential to impact any of the following waters:

(1) 303[d]-listed Impaired Waters or any tributary to a 303[d]-listed Impaired Water;
(2) Outstanding Arizona Waters or any tributary to an Outstanding Arizona Waters; or
(3) Lakes.

As the proposed Project will not result in potential impacts to any of the aforementioned waters, an Individual CWA Section 401 Water Quality Certification would not be required. However, it should be noted that the VA would still be required to adhere to all applicable CWA Section 401 General Conditions that have been issued by the ADEQ for conditionally certified NWPs.
7.3 RECOMMENDATIONS

It is highly recommended that this delineation be forwarded to the Corps and ADEQ for their review and concurrence.
Section 8    References


Appendix A – Site Photographs

**Photograph 1:** Looking south at non-jurisdictional roadside ditch along an unimproved access road.

**Photograph 2:** Looking south across the northwest corner of the project site.
Appendix A – Site Photographs

Photograph 3:  Looking southwest at upstream portion of Drainage 1 on the northwest portion of the project site.

Photograph 4:  Looking south at Drainage 1 on the western portion of the project site.
Photograph 5: Looking south at downstream portion of Drainage 1 on the southwest corner of the project site.

Photograph 6: Looking southwest at non-jurisdictional rill on the northwest portion of the project site.
Appendix A – Site Photographs

Photograph 7: Looking south at upstream portion of Drainage 2 on the western portion of the project site.

Photograph 8: Looking northeast at downstream portion of Drainage 2 on the southwest portion of the project site.
Appendix A – Site Photographs

Photograph 9: Looking southwest at upstream portion of Drainage 3 on the northern portion of the project site.

Photograph 10: Looking south at Drainage 3 on the central portion of the project site.
Appendix A – Site Photographs

Photograph 11: Looking southwest at downstream portion of Drainage 3 on the southwest portion of the project site.

Photograph 12: Looking east at non-jurisdictional rill on the northern portion of the project site.
Appendix A – Site Photographs

Photograph 13:  Looking southwest at the central portion of the project site.

Photograph 14:  Looking south at upstream portion of Drainage 4 on the eastern portion of the project site.
Photograph 15: Looking east at central portion of Drainage 4 on the southern portion of the project site.

Photograph 16: Looking northeast at downstream portion of Drainage 4 on the southern portion of the project site.
Appendix A – Site Photographs

Photograph 17:  Looking west at unimproved access road along the northern boundary of the project site.

Photograph 18:  Looking east across the northeast corner of the project site.
Appendix A – Site Photographs

Photograph 19: Looking southwest at non-jurisdictional rill on the eastern portion of the project site.

Photograph 20: Looking west at non-jurisdictional rill on the southeast corner of the project site.
WATERS OF THE UNITED STATES

Since 1972, the Corps and EPA have jointly regulated the filling of waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define “fill material” to include any “material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States.” Examples include, but are not limited to, the placement of sand, rock, clay, construction debris, wood chips, and “materials used to create any structure or infrastructure in the waters of the United States.” The term “waters of the United States” is defined as follows:

(i) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

(ii) All interstate waters, including interstate wetlands 3.

(iii) The territorial seas.

(iv) All impoundments of waters otherwise defined as waters of the United States under the definition.

(v) All tributaries 4 of waters identified in paragraphs (i) through (iii) mentioned above.

(vi) All waters adjacent 5 to a water identified in paragraphs (i) through (v) mentioned above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.

(vii) All prairie potholes, Carolina bays and Delmarva bays, Pocosins, western vernal pools, Texas coastal prairie wetlands, where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (i) through (iii) mentioned above.

(viii) All waters located within the 100-year floodplain of a water identified in paragraphs (i) through (iii) mentioned above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (i) through (v) mentioned above, where they are determined on a case-specific basis to have a

3 The term wetlands means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

4 The terms tributary and tributaries each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (iv) mentioned above), to a water identified in paragraphs (i) through (iii) mentioned above, that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark.

5 The term adjacent means bordering, contiguous, or neighboring a water identified in paragraphs (i) through (v) mentioned above, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like.
The following features are not defined as “waters of the United States” even when they meet the terms of paragraphs (iv) through (viii) mentioned above:

(i) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act.

(ii) Prior converted cropland.

(iii) The following ditches:

(A) Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

(B) Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

(C) Ditches that do not flow, either directly or through another water, into a water of the United States as identified in paragraphs (i) through (iii) of the previous section.

(iv) The following features:

(A) Artificially irrigated areas that would revert to dry land should application of water to area cease;

(B) Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;

(C) Artificial reflecting pools or swimming pools created in dry land;

(D) Small ornamental waters created in dry land;

(E) Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;

(F) Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of a tributary, non-wetland swales, and lawfully constructed grassed waterways; and

(G) Puddles.

(v) Groundwater, including groundwater drained through subsurface drainage systems.

(vi) Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

(vii) Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.
WETLANDS

For this geographic location, Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008). This document is one of a series of Regional Supplements to the Corps Wetland Delineation Manual (Corps 1987). The identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. In order to be considered a wetland, an area must exhibit at least minimal characteristics within these three (3) parameters. The Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. In the field, vegetation, soils, and evidence of hydrology are examined using the methodology listed below and documented on Corps’ wetland data sheets, when applicable.

Vegetation

Nearly 5,000 plant types in the United States may occur in wetlands. These plants, often referred to as hydrophytic vegetation, are listed in regional publications by the U.S. Fish and Wildlife Service (USFWS). In general, hydrophytic vegetation is present when the plant community is dominated by species that can tolerate prolonged inundation or soil saturation during growing season. Hydrophytic vegetation decisions are based on the assemblage of plant species growing on a site, rather than the presence or absence of particular indicator species. Vegetation strata are sampled separately when evaluating indicators of hydrophytic vegetation. A stratum for sampling purposes is defined as having 5 percent or more total plant cover. The following vegetation strata are recommended for use across the Arid West:

- **Tree Stratum:** Consists of woody plants 3 inches or more in diameter at breast height (DBH), regardless of height;
- **Sapling/shrub stratum:** Consists of woody plants less than 3 inches DBH, regardless of height;
- **Herb stratum:** Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size; and,
- **Woody vines:** Consists of all woody vines, regardless of size.

The following indicator is applied per the test method below.⁶ Hydrophytic vegetation is present if any of the indicators are satisfied.

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⁶ Although the Dominance Test is utilized in the majority of wetland delineations, other indicator tests may be employed. If one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present, then the Prevalence Test (Indicator 2) may be performed. If the plant community satisfies the Prevalence Test, then the vegetation is hydric. If the Prevalence Test fails, then the Morphological Adaptation Test may be performed, where the delineator analyzes the vegetation for potential morphological features.
Indicator 1 – Dominance Test

Cover of vegetation is estimated and is ranked according to their dominance. Species that contribute to a cumulative total of 50% of the total dominant coverage, plus any species that comprise at least 20% (also known as the “50/20 rule”) of the total dominant coverage, are recorded on a wetland data sheet. Wetland indicator status in California (Region 0) is assigned to each species using the National Wetland Plant List, version 2.4.0 (Corps 2012). If greater than 50% of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation is considered to be met. Plant indicator status categories are described below:

- **Obligate Wetland (OBL):** Plants that almost always occur in wetlands;
- **Facultative Wetland (FACW):** Plants that usually occur in wetlands, but may occur in non-wetlands;
- **Facultative (FAC):** Plants that occur in wetlands and non-wetlands;
- **Facultative Upland (FACU):** Plants that usually occur in non-wetlands, but may occur in wetlands; and,
- **Obligate Upland (UPL):** Plants that almost never occur in wetlands.

Hydrology

Wetland hydrology indicators are presented in four (4) groups, which include:

**Group A – Observation of Surface Water or Saturated Soils**

Group A is based on the direct observation of surface water or groundwater during the site visit.

**Group B – Evidence of Recent Inundation**

Group B consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.

**Group C – Evidence of Recent Soil Saturation**

Group C consists of indirect evidence that the soil was saturated recently. Some of these indicators, such as oxidized rhizospheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

**Group D – Evidence from Other Site Conditions or Data**
Group D consists of vegetation and soil features that indicate contemporary rather than historical wet conditions, and include shallow aquitard and the FAC-neutral test.

If wetland vegetation criteria is met, the presence of wetland hydrology is evaluated at each transect by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil test pits. The lateral extent of the hydrology indicators are used as a guide for locating soil pits for evaluation of hydric soils and jurisdictional areas. In portions of the stream where the flow is divided by multiple channels with intermediate sand bars, the entire area between the channels is considered within the OHWM and the wetland hydrology indicator is considered met for the entire area.

Soils

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper 16-20 inches. The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. It should also be noted that the limits of wetland hydrology indicators are used as a guide for locating soil pits. If any hydric soil features are located, progressive pits are dug moving laterally away from the active channel until hydric features are no longer present within the top 20 inches of the soil profile.

Once in the field, soil characteristics are verified by digging soil pits along each transect to an excavation depth of 20 inches; in areas of high sediment deposition, soil pit depth may be increased. Soil pit locations are usually placed within the drainage invert or within adjoining vegetation. At each soil pit, the soil texture and color are recorded by comparison with standard plates within a Munsell Soil Chart (2009). Munsell Soil Charts aid in designating color labels to soils, based by degrees of three simple variables – hue, value, and chroma. Any indicators of hydric soils, such as organic accumulation, iron reduction, translocation, and accumulation, and sulfate reduction, are also recorded.

Hydric soil indicators are present in three groups, which include:

All Soils

“All soils” refers to soils with any United States Department of Agriculture (USDA) soil texture. Hydric soil indicators within this group include histosol, histic epipedon, black histic, iron reduction, and sulfate reduction, according to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008), growing season dates are determined through on-site observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature.
hydrogen sulfide, stratified layers, 1 cm muck, depleted below dark surface, and thick dark surface.

**Sandy Soils**

“Sandy soils” refers to soil materials with a USDA soil texture of loamy fine sand and coarser. Hydric soil indicators within this group include sandy mucky mineral, sandy gleyed matrix, sandy redox, and stripped matrix.

**Loamy and Clayey Soils**

“Loamy and clayey soils” refers to soil materials with a USDA soil texture of loamy very fine sand and finer. Hydric soil indicators within this group include loamy mucky mineral, loamy gleyed matrix, depleted matrix, redox dark surface, depleted dark surface, redox depressions, and vernal pools.

**RAPANOS WATERS**

The Corps will assert jurisdiction over non-navigable, not relatively permanent tributaries and their adjacent wetlands where such tributaries and wetlands have a significant nexus to a TNW. The flow characteristics and functions of the tributary itself, in combination with the functions performed by any wetlands adjacent to the tributary, determine if these waters/wetlands significantly affect the chemical, physical, and biological integrity of the TNWs. Factors considered in the significant nexus evaluation include:

1. The consideration of hydrologic factors including, but not limited to, the following:
   - volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary
   - proximity to the TNW
   - size of the watershed average annual rainfall
   - average annual winter snow pack

2. The consideration of ecologic factors including, but not limited to, the following:
   - the ability for tributaries to carry pollutants and flood waters to TNWs
   - the ability of a tributary to provide aquatic habitat that supports a TNW
   - the ability of wetlands to trap and filter pollutants or store flood waters
Appendix C – Documentation

National Memorial Cemetery of Arizona Gravesite Expansion and Cemetery Improvements
Delineation of Jurisdictional Waters