

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

LC-17-19

Right of Use - Downgradient Study Area Activities

Lower Colorado Region
Boulder City, Nevada



U.S. Department of the Interior
Bureau of Reclamation
Lower Colorado Region
Boulder City, Nevada

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Mission Statements

The mission of the Department of the Interior is to protect and manage the Nation's natural resources and cultural heritage; provide scientific and other information about those resources; and honor its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
1.1	Background for the Proposed Action.....	1
1.2	Purpose and Need	2
1.3	Related Laws, Policies, and Planning Documents.....	2
2.0	DESCRIPTION OF ALTERNATIVES	3
2.1	No Action Alternative.....	3
2.2	Proposed Action Alternative.....	3
2.2.1	Phase I and Phase II Groundwater Monitoring Wells	4
2.2.2	Full-Scale Geophysical Investigation and Geophysical Verification Soil Borings	11
2.2.3	Design Features	16
2.3	Alternatives Considered but Not Evaluated in Detail.....	18
3.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	19
3.1	Past, Present, and Reasonably Foreseeable Future Projects	19
3.1.1	Clark County Wetlands Park.....	19
3.1.2	Weir Dewatering	19
3.1.3	Entire Downgradient Study Area Investigation including City of Henderson and Clark County Land	20
3.2	Resources Considered but Not Discussed Further.....	23
3.3	Resources Discussed Further	26
3.3.1	Air Quality.....	26
3.3.2	Biological Resources	29
3.3.3	Cultural Resources/Traditional Cultural Properties/Sacred Sites	35
3.3.4	Recreation.....	39
3.3.5	Visual Resources	40
4.0	COORDINATION AND CONSULTATION.....	41
4.1	Agencies Consulted	41
4.2	Endangered Species Consultation.....	41
4.3	Public Involvement	42
5.0	REFERENCES.....	42
6.0	LIST OF PREPARERS	43

List of Tables

Table 1. Minimum and Maximum Disturbance Acreages 4
Table 2. Entire Downgradient Study Area Land Ownership and Minimum and Maximum
Disturbance Acreages 20
Table 3. Construction Emissions for the Proposed Action 27
Table 4. Operational Emissions for the Proposed Action 28
Table 5. 2018 Cumulative Emissions 29

List of Figures

Figure 1. Downgradient Study Area Location Map 5
Figure 2. Proposed Phase I and II Monitoring Wells (Preliminary) 6
Figure 3. Disturbance Areas and Vegetation for Phase I and II Wells – Western Downgradient
Study Area 9
Figure 4. Disturbance Areas and Vegetation for Phase I and II Wells –Eastern Downgradient
Study Area 10
Figure 5. Full-Scale Geophysical Survey Line Locations (Preliminary) 13
Figure 6. Groundwater Investigation Locations 21
Figure 7. Desert Tortoise Critical Habitat in Vicinity of Proposed Downgradient Study Area ... 31
Figure 8. Desert Tortoise Survey Areas on Reclamation Managed Lands 32
Figure 9. Desert Tortoise Survey Areas 33

List of Acronyms and Abbreviations

Acronym or abbreviation	Term
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CRCC	Cultural Resource Coordinating Committee
DAQ	Clark County Department of Air Quality
District	Las Vegas Wash Archaeological District
DWR	Division of Water Resources
EA	Environmental Assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERI	electrical resistivity investigation
GI	geophysical investigation
ITA	Indian Trust Assets
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NDEP	Nevada Division of Environmental Protection
NEPA	National Environmental Policy Act of 1969
NERT	Nevada Environmental Response Trust
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NOI	Notice of Intent
O ₃	Ozone
PA	programmatic agreement
Pb	Lead
PM ¹⁰	particulate matter measuring less than 10 microns
PM ^{2.5}	particulate matter measuring less than 2.5 microns
PVC	polyvinylchloride
Reclamation	Bureau of Reclamation
RI	remedial investigation
ROU	Right of Use
Service	United States Fish and Wildlife Service
SHPO	State Historic Preservation Office
SNWA	Southern Nevada Water Authority
SO ₂	sulfur dioxide
SR	Seismic Refraction
TDEM	Time Domain Electromagnetics
U.S.	United States

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1.0 Introduction

This Environmental Assessment (EA) was prepared in compliance with the National Environmental Policy Act (NEPA) (42 United States [U.S.] Code 4321, et seq.) and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 Code of Federal Regulations [CFR] Parts 1500-1508). The purpose of this EA is to evaluate the potential impacts of the Proposed Action on the physical and human environment and determine if there would be adverse impacts requiring the preparation of an Environmental Impact Statement.

The Bureau of Reclamation (Reclamation) is proposing to issue a Right of Use (ROU) (Contract #16-07-30-L0850) to the Nevada Division of Environmental Protection (NDEP) to conduct activities on Reclamation-managed land in Clark County, Nevada. These activities include installation and monitoring of Phase I and II groundwater wells, and a full-scale geophysical investigation (GI) within the Downgradient Study Area (see Figure 1 for the area designated as the Downgradient Study Area). Detailed descriptions of these activities can be found in sections 2.2 and 2.3. The activities on Reclamation-managed land will be referred to as the “Proposed Action” in this EA.

1.1 Background for the Proposed Action

The Nevada Environmental Response Trust (NERT) Site was previously known as the Kerr McGee/Tronox site (see Figures 1, 2, 5, and 6). The NERT Site was developed by the U.S. government in 1942 as a magnesium plant to support World War II operations. Following the war, this area continued to be used for industrial activities, including production of perchlorate, boron, and manganese compounds. Former industrial and waste management activities conducted at the NERT Site, as well as those conducted at adjacent properties, resulted in contamination of soil, groundwater, and surface water. Since 1979, the NERT Site has been the subject of numerous investigations and removal actions. Soil removal actions were conducted in 2010, 2011, and 2013 on the NERT Site to minimize potential health risks from impacted soil (ENVIRON International Corporation 2012). Groundwater in the vicinity and downgradient of the NERT Site, including the Las Vegas Wash, is contaminated with perchlorate and hexavalent chromium. On-site and off-site groundwater removal actions are being conducted and include the installation of a groundwater extraction and treatment system, which is designed to capture and treat perchlorate and hexavalent chromium in shallow groundwater. This extraction and treatment has occurred continuously since 2002. Between July 2004 and December 2016, approximately 4,600 tons of perchlorate and 22 tons of hexavalent chromium have been removed by the groundwater extraction and treatment system (Ramboll Environ 2017).

NERT is conducting a remedial investigation (RI) for the NERT Site and adjacent off-site areas that will provide data to support future remedial actions. Additional information on the RI can be found at <http://nert-trust.com>. Concurrent with NERT’s RI, NDEP, in conjunction with NERT and the U.S. Environmental Protection Agency (EPA), is conducting an investigation to evaluate potential NERT Site-related impacts to the subsurface and Las Vegas Wash in the Downgradient Study Area, outside the current NERT RI Study Area. The purpose of the Downgradient Study Area investigation is to collect additional information to evaluate the nature and extent of perchlorate and other NERT Site-related contaminants in groundwater through

identifying subsurface pathways through which perchlorate-impacted groundwater is entering the Las Vegas Wash. Information on groundwater and subsurface features that may be contributing to perchlorate loading to the Las Vegas Wash will be incorporated into the RI and used in the development of future remedial actions. Figure 1 shows the northern portion of the NERT Site and the Downgradient Study Area.

The Downgradient Study Area is approximately 1,340 acres located 13 miles southeast of Las Vegas in an unincorporated section of Clark County, Nevada (Figure 1). It is surrounded by the incorporated area of the City of Henderson. Approximately 230 acres in the northeastern and central portions of the Downgradient Study Area are administered by Reclamation. Other landowners within the Study Area include Clark County and the City of Henderson. The activities for the Proposed Action include installation and monitoring of Phase I and II groundwater wells, and a full-scale GI within the Downgradient Study Area. These activities are anticipated to start the first quarter of 2018 and continue through the first quarter of 2019.

1.2 Purpose and Need

The purpose of the Proposed Action is to respond to NDEP's application for an ROU. It is Reclamation's responsibility under the Act of Congress of June 17, 1902 (32 Stat. 388), the Act of Congress approved August 4, 1939 (53 Stat. 1187), Section 10, and Title 43 CFR Part 429 to respond to a request for a ROU on Reclamation-managed land.

The data gathered from the Downgradient Study Area will be used in the RI and Feasibility Study, which will determine eventual remediation actions. Identification of subsurface pathways and development of remediation actions by NDEP will benefit both the public and the environment. Reclamation-managed land is located in the center of the Downgradient Study Area so determining the extent of the contamination in this area will aid in effective completion of NDEP's actions. The Proposed Action is needed because use of Reclamation-managed land will result in a more comprehensive Downgradient Study Area investigation.

1.3 Related Laws, Policies, and Planning Documents

This EA complies with all applicable environmental, natural resource, and cultural resource statutes, regulations, and guidelines. These statutes, regulations and guidelines may require permits, approvals, consultations with outside agencies, or implementation of mitigation measures.

The following federal, state, and local statutes and regulations are relevant to the Proposed Action:

- NEPA
- Executive Order (EO) 11988 - Floodplain Management (1977)
- EO 11990 - Protection of Wetlands (1977)
- EO 13007 - Indian Sacred Sites (1996)
- EO 11593 - Protection and Enhancement of the Cultural Environment (1971)
- EO 13186 - Protection of Migratory Birds (2001)
- EO 11514 - Protection and Enhancement of Environmental Quality(1970)

- EO 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)
- EO 13693 - Planning for Federal Sustainability in the Next Decade (2015)
- EO 13287 - Preserve America (2003)
- Clean Air Act of 1970 and amendments of 1977 and 1990
- Clean Water Act of 1970 and National Pollution Discharge Elimination System, as amended
- Safe Drinking Water Act of 1974
- Endangered Species Act of 1973
- Migratory Bird Treaty Act (MBTA) of 1918
- National Historic Preservation Act of 1966, as amended
- Archaeological Resources Protection Act of 1979
- Native American Graves Protection and Repatriation Act of 1990
- Noise Control Act of 1972
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Resource Conservation Recovery Act of 1976, as amended
- Occupational Health and Safety Act of 1970, as amended
- Chapter 445B of Nevada Administrative Code (NAC): State of Nevada's air pollution regulations
- Clark County Air Quality Regulations

2.0 Description of Alternatives

2.1 No Action Alternative

The No Action Alternative provides a basis for comparing the environmental consequences of the Proposed Action. Under the No Action Alternative, Reclamation would not issue authorization for the portions of the Downgradient Study Area investigation on Reclamation-managed land. The Downgradient Study Area investigation would be implemented without the use of Reclamation-managed land. Some Reclamation-managed areas where perchlorate-impacted groundwater is suspected to be entering the Las Vegas Wash would not be investigated, thus hampering efforts to understand the extent of perchlorate contamination in groundwater. This would ultimately slow the implementation of a comprehensive remedial action designed to reduce the migration of perchlorate from groundwater to the Las Vegas Wash.

2.2 Proposed Action Alternative

The Proposed Action would include Phase I well installations, Phase II well installations, a full-scale GI, including verification borings, and access paths on Reclamation land. Approximately, 60 acres of the Proposed Action are located on Reclamation-managed land (Figure 1).

The activities within the Downgradient Study Area are divided into several components where the results of each component may influence decisions regarding locations and number of investigation points of subsequent components. The portions of these components that are

included in the Proposed Action and their current status are given below. For the total number of wells, disturbance acres and other details of the entire Downgradient Study Area, see Section 3.1.3.

1. Phase I groundwater investigation as summarized below includes installing, developing and sampling three groundwater monitoring wells (Section 2.2.1) on Reclamation-managed land. Anticipated implementation of this phase is in the first and second quarter of 2018, dependent upon when the Reclamation access permit is issued.
2. Full-scale GI as summarized below will include limited crushing of vegetation, and drilling, logging and backfilling up to four confirmation borings along the GI lines (Section 2.2.2) on Reclamation-managed land. Anticipated implementation of this phase is first and second quarter of 2018, dependent upon when the Reclamation access permit is issued.
3. Phase II groundwater investigation, as summarized below, includes installing, developing and sampling six groundwater monitoring wells on Reclamation-managed land. The locations of these six wells are dependent upon the Phase I groundwater investigation sampling results and full-scale GI (Section 2.2.1); however, wells will only be located in areas that have been authorized by the ROU. Aquifer testing and tracer testing will be performed during Phase II on a select number of wells based on the Phase I and Phase II groundwater monitoring data. Anticipated implementation is in the fourth quarter of 2018 and first quarter of 2019, dependent upon when the Reclamation ROU permit is issued.

Table 1 provides a summary of project components on Reclamation-managed land, including minimum and maximum disturbance acreages. For reference, a summary is also provided for the entire Downgradient Study Area, which includes Reclamation-managed land.

Table 1. Minimum and Maximum Disturbance Acreages

	Proposed Action- Reclamation Land			Entire Downgradient Study Area Investigation		
	Total	Minimum Disturbance (acres)	Maximum Disturbance (acres)	Total	Minimum Disturbance (acres)	Maximum Disturbance (acres)
Phase I Wells*	3	0.10	0.69	10	0.34	2.30
Phase II Wells*	6	0.21	1.38	13	0.45	2.98
Full Scale GI Survey Line (feet)	10,100	1.39	30.14	25,800	3.55**	77.0**
GI Soil Verification Borings*	4	0.14	0.92	20	0.69	4.59

* Minimum footprint for mini-sonic drill rig is 50 feet by 30 feet. Maximum footprint for full-size rotary sonic rig is 100 feet by 100 feet.

** The survey equipment would be laid out approximately 6 feet to 130 feet from the survey line.

2.2.1 Phase I and Phase II Groundwater Monitoring Wells

The proposed preliminary Phase I and Phase II monitoring well locations in the Downgradient Study Area are shown on Figure 2. The proposed well locations were selected to address data gaps identified from the results of one groundwater and two surface water investigations conducted in April 2016, May 2016, and February 2017, respectively. As shown on Figure 2,

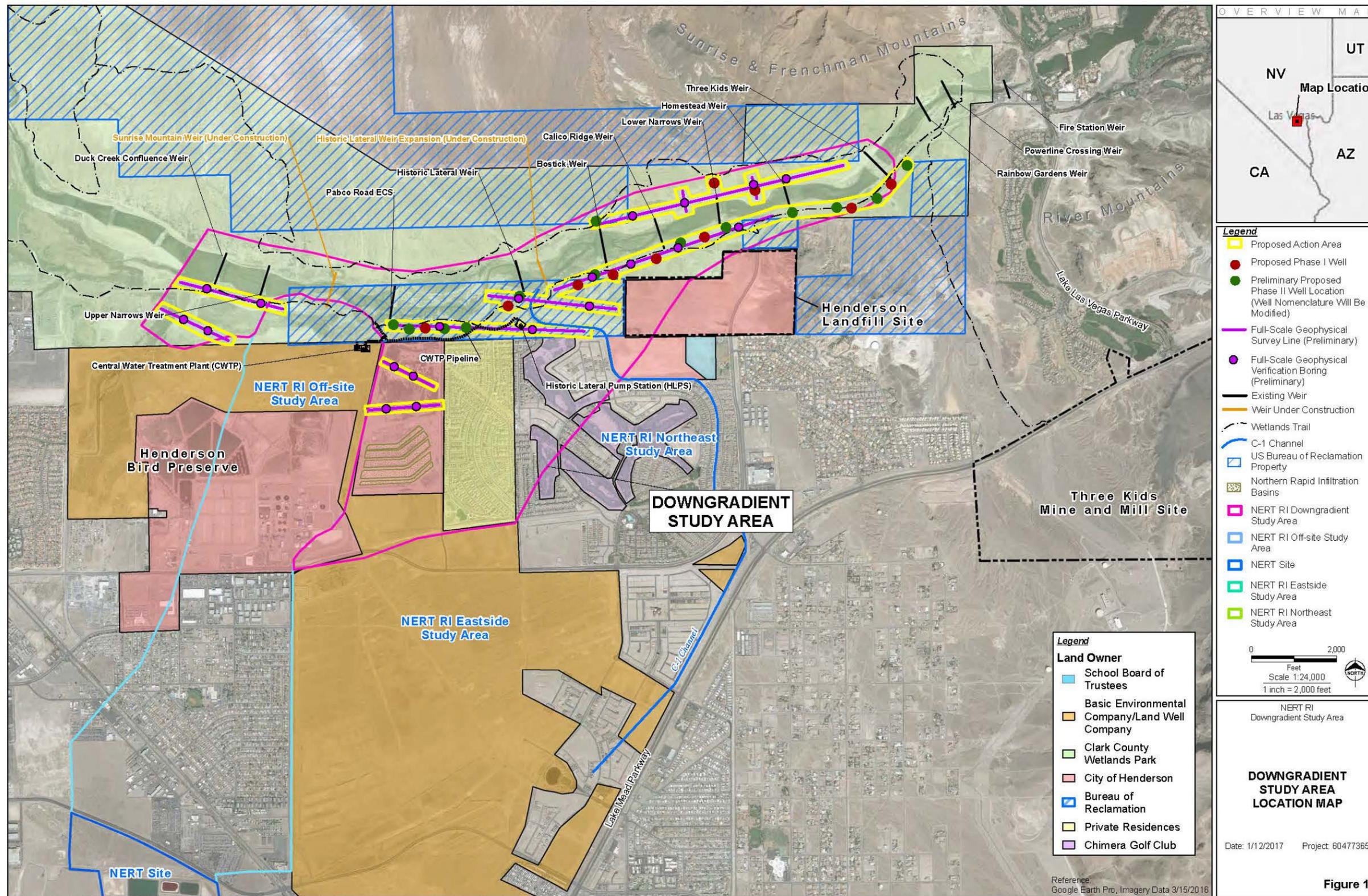


Figure 1. Downgradient Study Area Location Map

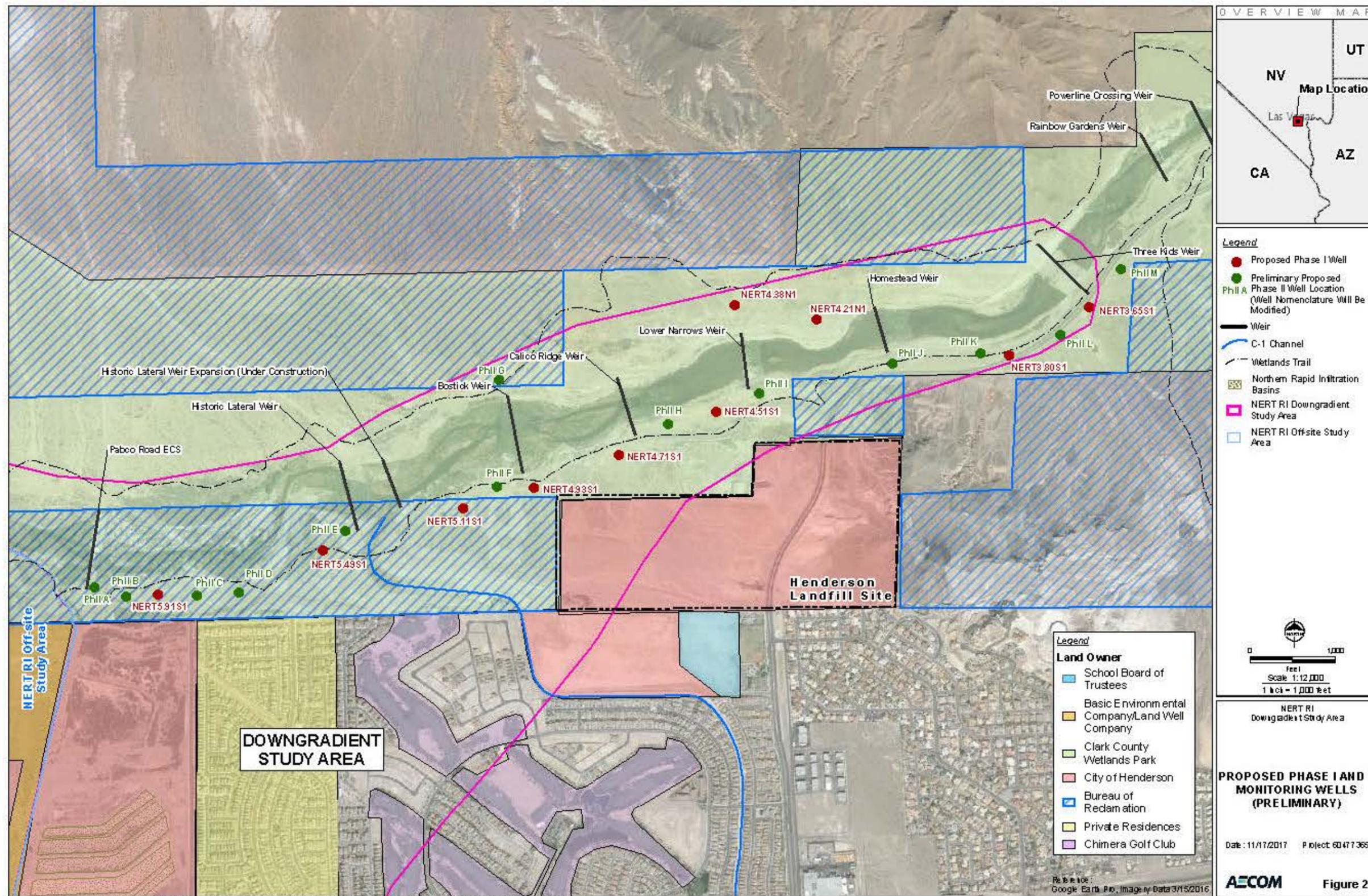


Figure 2. Proposed Phase I and II Monitoring Wells (Preliminary)

three Phase I monitoring wells (NERT 5.91S1, 5.49S1, and 5.11S1) and six Phase II monitoring wells (Ph II A-E, G) are proposed on Reclamation-managed land. For Phase I monitoring wells, the minimum and maximum disturbance acreages on Reclamation-managed land are 0.10 and 0.69 acres, respectively. For Phase II monitoring wells, the maximum disturbance acreages on Reclamation-managed land are 0.21 and 1.38 acres, respectively.¹ However, the locations of Phase I and Phase II monitoring wells may be adjusted, where feasible and necessary, to accommodate biological and cultural resources. The locations of the Phase II monitoring wells may also be adjusted based on data obtained in the Phase I monitoring well installation and the GI. Placement of the Phase II monitoring wells will only occur in previously surveyed or analyzed locations. Adjustments to well locations will be limited to within the 100-foot by 100-foot disturbance area. As discussed previously, Phase I and the GI are planned to occur in the first and second quarter of 2018.

2.2.1.1 Procedures for Installing and Abandoning Monitoring Wells

Monitoring wells would be installed (and eventually properly abandoned) consistent with NAC requirements including NAC 534.4351 to 534.4365. It is estimated that monitoring wells would be used for up to 20 years. Consistent with NAC 534.320, a Notice of Intent (NOI) to drill would be submitted to the Division of Water Resources (DWR). Drilling would not commence until the DWR approves the NOI. At least five business days prior to groundbreaking activities, Underground Service Alert would be notified of the locations, depths, and dates of drilling. A utility clearance geophysical survey, with a magnetometer or similar device, would be conducted at the boring locations and the top 6 feet would be hand augered or air knifed.²

Soil borings associated with the Phase I and Phase II monitoring wells would be drilled using either a mini-sonic drill rig or a full-size rotary sonic rig. Additional equipment would include two support vehicles (utility trucks). Up to four workers (two to three drillers and one geologist) would be present on site during drilling activities. The disturbance footprint for the drilling and installation of the wells would be approximately 50 feet by 30 feet for the mini-sonic drill rig and 100 feet by 100 feet for the full-size rotary sonic rig (Figures 3 and 4).

Boreholes would be 12 inches in diameter. The expected maximum drilling depth is 120 feet, but this depth could be extended deeper if a feature of interest is identified that needs to be investigated at greater depth. Sonic drilling would yield continuous geologic borehole data. Materials encountered would be logged using the Unified Soil Classification System. A detailed boring log would be prepared from the sonic core and an electric log would be run in each well.

The well casings would be 4-inch-diameter, Schedule 40 polyvinylchloride (PVC) piping. The well casing connections would comply with NAC 534.362 and would be threaded and watertight. Both ends of the casing would be capped. Well completions would be above ground with approximately 3 feet of mild steel casing, a surface pad, and a lockable well cap above grade with four protective posts installed around each well. Traffic-rated, at-grade completions

¹ Calculations for the minimum disturbance acreage assumed a mini-sonic drill rig footprint of 50 feet by 30 feet. Calculations for the maximum disturbance acreage assumed a full-size rotary sonic rig footprint of 100 feet by 100 feet.

² Air knifing utilizes high-velocity air to break up the subsurface soil, which is then removed from the hole using a vacuum.

could also be installed, if needed, in specific areas. Wells would be locked and clearly marked as monitoring wells.

Each well would be developed after installation and would consist of surging and pumping or bailing the well to remove drilling materials and fine-grained sediment from the well pack. Groundwater samples would be collected for analysis from the new wells and analyzed for total chromium, hexavalent chromium, bromide, chloride, chlorate, perchlorate, and total dissolved solids. The wells would be surveyed using the standard site coordinate system. Aquifer pump testing and tracer testing would be performed on a select number of wells during Phase II based on the groundwater monitoring data during these respective phases. Once the wells are installed, groundwater samples would be collected up to four times per year. Additionally, transducer data would be downloaded quarterly, and groundwater level measurements would be collected monthly for each well although these frequencies may be reduced over time.

A monitoring well would be plugged once it is no longer needed. A NOI or waiver would be submitted to DWR for approval prior to plugging the well. After approval, the well would be plugged by removing the well casing and grouting the well to the surface with neat cement. If the well casing cannot be removed, the monitoring well could be plugged by placing neat cement by tremie pipe³ in an upward direction from the bottom of the well to the surface (NAC 534.4365). Additionally, if artesian groundwater conditions are encountered, the artesian water strata must be sealed or contained consistent with NAC 534.378. If there is evidence of water-draining formations (lost circulation) or water-bearing formations of different water quality, there must be neat cement placed across the water-confining formations to prevent the vertical migration of water. Up to six workers, a drill rig, cement truck, utility truck, and up to two support trucks would be needed to plug a monitoring well. The process for plugging a well would take approximately 2 days per well.

A well drillers report would be submitted to the State Engineer within 30 days of well construction and/or well plugging. The report would include pertinent information listed under NAC 534.340 and NAC 534.170, including the name and address of the person or entity for whom the work was performed; location of the well; the dates drilled or plugged; any pump test data; depth, diameter, and perforated interval of the well; static water level; temperature of the water; and methods and materials used to install or plug the well.

Crushing or trimming of vegetation, drilling, logging, well installation, and well development are expected to take approximately 1 week for the three Phase I wells and approximately 2 weeks for the six Phase II wells. Groundwater sampling activities are expected to take approximately 1 week for the three Phase I wells and seven existing wells and 1.5 weeks for the six Phase II wells and seven existing wells.⁴ Pumping tests of select new wells is expected to take approximately 7 weeks and will be performed during Phase II of the investigation. The locations and number of pumping test wells will be determined based on data collected during installation, development and sampling of the new wells.

³ A vertical pipe through which concrete is placed by gravity feed below water level.

⁴ Timeframe to complete the Phase I and II well installations and groundwater sampling for the entire Downgradient Study Area is 8 weeks for Phase I and 13 weeks for Phase II.

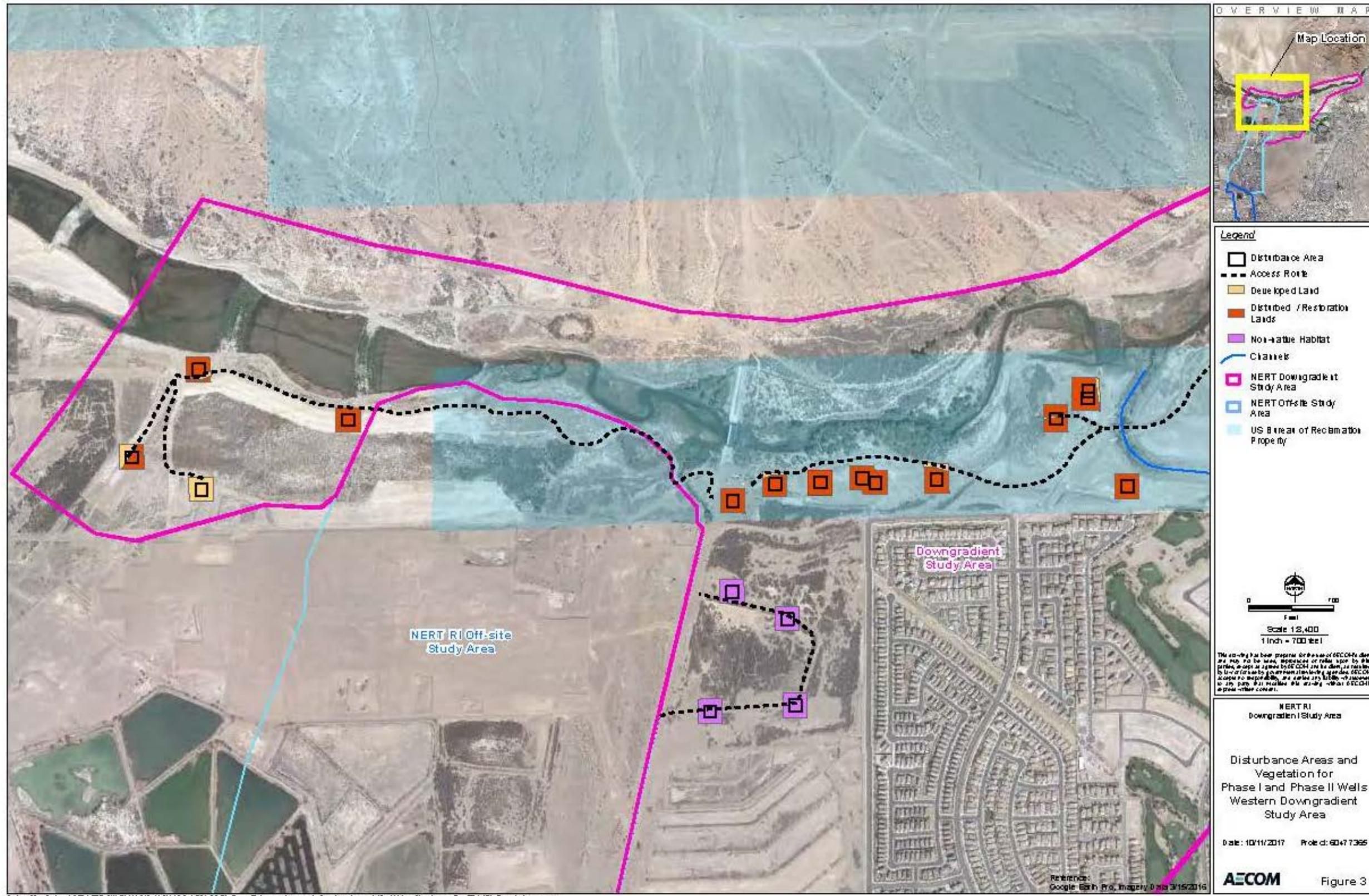


Figure 3. Disturbance Areas and Vegetation for Phase I and II Wells – Western Downgradient Study Area

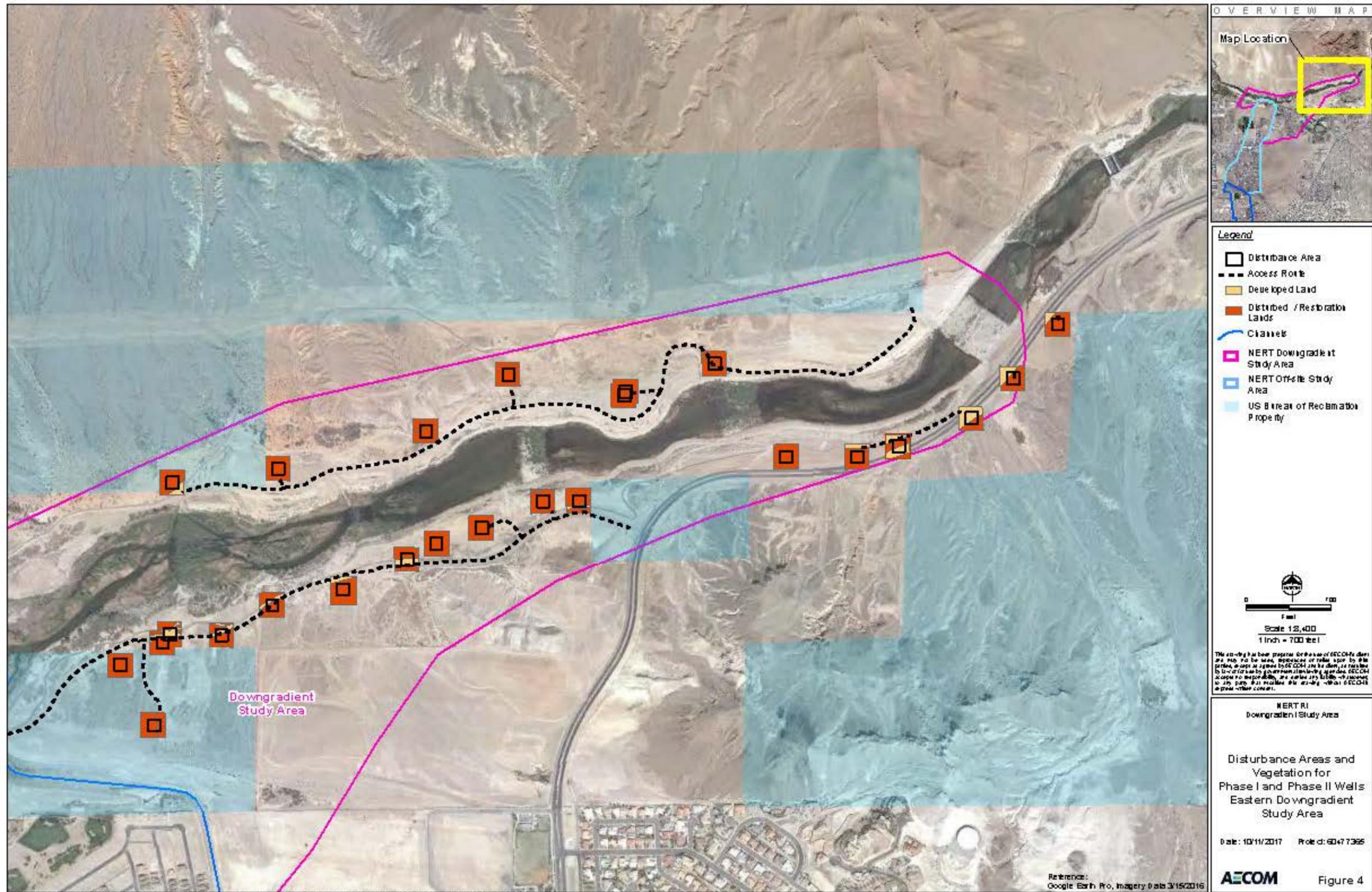


Figure 4. Disturbance Areas and Vegetation for Phase I and II Wells –Eastern Downgradient Study Area

2.2.2 Full-Scale Geophysical Investigation and Geophysical Verification Soil Borings

The full-scale GI would cover approximately 10,100 linear feet on Reclamation-managed land as shown on Figure 5. The investigation area for each GI line would consist of an area of 50 feet on either side of the GI line to allow for adjustments. As shown on Figure 5, four geophysical survey lines would be located within Reclamation-managed lands. Geophysical survey lines 5 and 6 would be completely located within Reclamation-managed land while only a portion of geophysical survey lines 7 and 8 would be located on Reclamation-managed land. The minimum and maximum potential areas of disturbance would be 1.39 and 30.14 acres, respectively.⁵

Geophysical survey results from the GI would be verified by drilling soil borings along the geophysical survey lines to confirm features observed in the geophysical survey data. It is anticipated that four soil borings would be drilled on Reclamation-managed land to verify subsurface conditions identified in the GI. The minimum and maximum disturbance acreages on Reclamation-managed land would be 0.14 and 0.92 acres, respectively.⁶ Soil borings would be located along the geophysical survey lines as shown on Figure 5.

2.2.2.1 Procedures for Conducting the Full-Scale Geophysical Investigation

The proposed geophysical survey lines would be screened for biologically sensitive species and cultural resources prior to conducting a subsurface utility clearance. The subsurface utility clearance would screen for potential electromagnetic sources, such as buried pipes, electrical lines, or metal fencing (i.e., utility clearance). If metallic or electrical-related objects are identified along or crossing the survey lines during the utility clearance, the line location would be adjusted or moved to avoid potential impacts to subsurface utilities or interference with geophysical survey data collection. A biologist and cultural resource specialist would be on site to survey and clear the location of the relocated line of biological or cultural resources. When the survey line locations are confirmed to be clear of electromagnetic sources, a land surveyor would accurately position survey stakes for the lines with end stakes and internal stakes at 300-foot intervals.

Various electrodes and geophones would be inserted into the ground to a maximum depth of 10 inches. This equipment would then be connected by wires to the control equipment where it would be recorded. The survey equipment would be laid out approximately 6 feet to 130 feet from the survey line. The cables used to conduct the survey are very thin and are laid on the ground or over low-lying vegetation; therefore, ground disturbance is minimal.

If needed, vegetation will be crushed or trimmed at all or part of the survey lines to allow the geophysical survey line equipment to be laid out and the survey measurements to be obtained. The need for trimming of vegetation depends on the geophysical methods to be used. Due to

⁵ The minimum and maximum disturbance acreages were calculated with the assumption that survey equipment would be laid out approximately 6 feet to 130 feet from the survey line.

⁶ Calculations for the minimum disturbance acreage assumed a mini-sonic drill rig footprint of 50 feet by 30 feet. Calculations for the maximum disturbance acreage assumed a full-size rotary sonic rig footprint of 100 feet by 100 feet.

sparse plant populations on Reclamation-managed land, it is anticipated that limited crushing of vegetation with a vehicle may be the preferred method of site preparation for some of the GI line locations. Prior to conducting the trimming or crushing for the GI, a biologist will conduct a field survey to verify that no sensitive flora or fauna species are present in the areas where the work would be conducted. It is anticipated that an area of at least 6 feet in width along the survey lines on private lands would be cleared by trimming of vegetation using hand tools or mechanical equipment to allow the cables to lie on or close to the ground surface. No grubbing will be conducted. It is anticipated that a maximum of approximately 0.6 acre of vegetation on Reclamation-managed lands would be crushed.⁷

The geophysical system applied to the lines would be an electrical (direct current) resistivity investigation (ERI). An ERI is a geophysical method in which an electrical current is injected into the ground through electrodes and voltages are measured at other surface electrodes. These measurements indicate the direction and amount of current flow in the subsurface. The recorded data are used to create a geo-electric model to represent the variation of apparent resistivity across the section. This section is then interpreted to relate apparent resistivity to subsurface geology up to a depth of one-quarter to one-fifth of the profile length.

In addition, Time Domain Electromagnetics (TDEM) would be used to characterize deeper or anomalous features. TDEM uses electric and magnetic fields that are induced by a transient pulse followed by measurement of the decay response to determine subsurface electrical properties up to a depth of 100 feet.

Seismic Refraction (SR) surveys may be used in areas where groundwater depth information is not available but is needed to facilitate ERI or TDEM interpretation. SR has three components: a controlled shot of seismic energy (the source), sensors (geophones) to receive the energy, and a seismograph connected to a recording device to record the data. The seismic energy is refracted along geologic material boundaries back to the geophones along the survey line. SR is commonly used to map the depth to bedrock and bedrock topography to a depth of one-quarter of the profile length.

The field crew for the GI would include up to four people and up to two pickup trucks or sport utility vehicles.

2.2.2.2 Procedures for Drilling and Backfilling Verification Soil Borings

Boreholes would be drilled (and abandoned) consistent with NAC requirements 534.4369 to 534.438. At least five business days prior to groundbreaking activities, Underground Service Alert would be notified of the locations, depths, and dates of drilling. A utility-clearance geophysical survey, with a magnetometer or similar device, would be conducted at the boring locations and the top 6 feet would be hand augered or air knifed. Two vehicles (utility or pick-up trucks) would be on site during utility clearance activities.

⁷ Calculations for the maximum disturbance acreage from crushing of vegetation assumed footprint of 6 feet by 4,000 feet, which is conservative given the low density of plant populations.

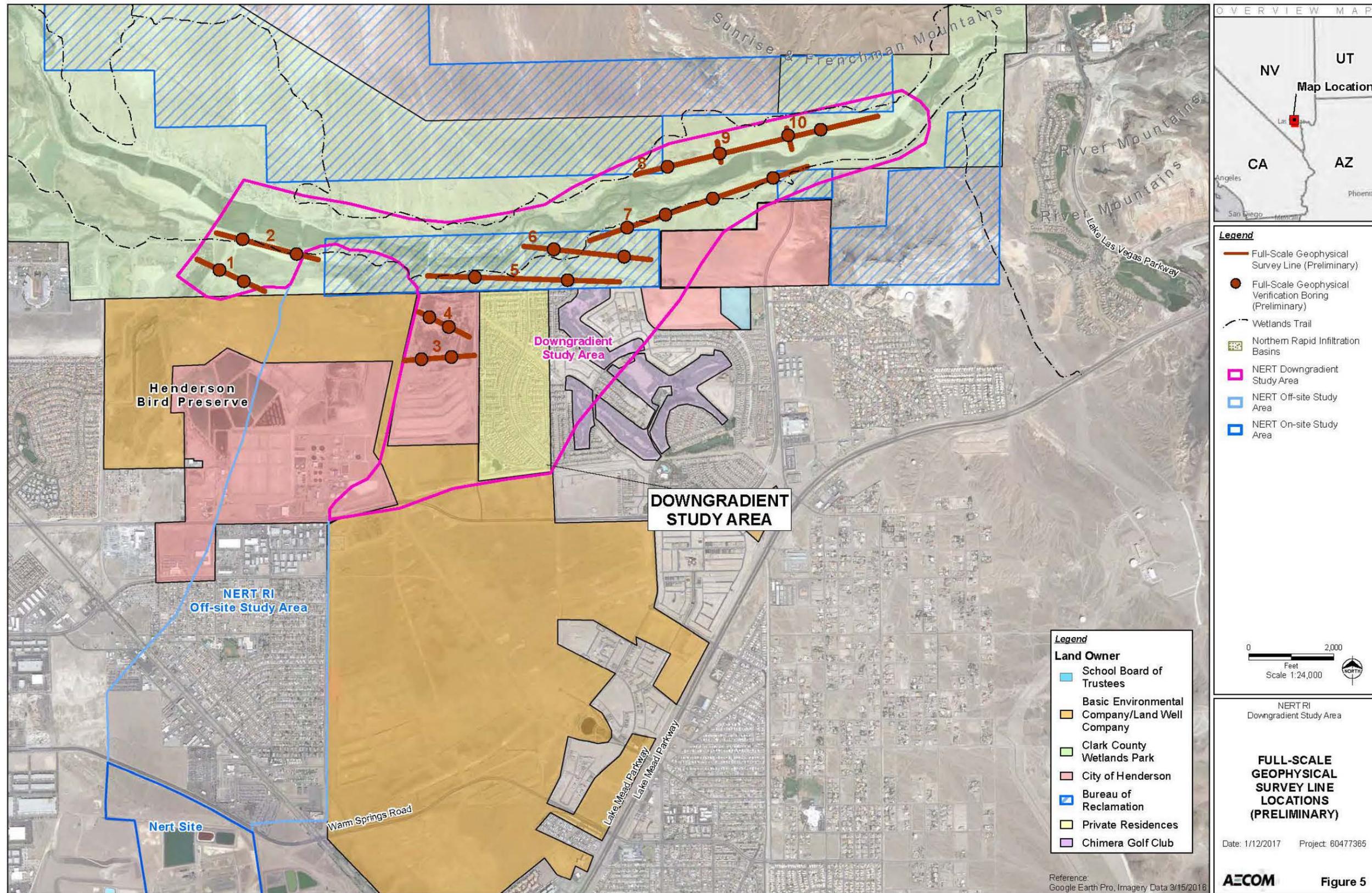


Figure 5. Full-Scale Geophysical Survey Line Locations (Preliminary)

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Boreholes would be 6 to 12 inches in diameter. The minimum drilling depth for each boring is 75 feet, but this depth could be extended deeper if the geophysical results indicate “structures” of interest (i.e., top of the Upper Muddy Creek formation, fault, paleochannel, etc.) that need to be investigated at greater depth. Sonic drilling yielding continuous geologic borehole data would be employed. The borehole locations would be selected in consideration of access, sensitive biological and cultural resources, and after reviewing the geophysical results so that the boreholes can explore areas of interest.

Materials encountered would be logged using the Unified Soil Classification System. A detailed boring log would be prepared from the soil cuttings and an electric log would be run in each borehole. Boreholes would be cased with 3-inch-diameter PVC piping to allow for the electric log to be conducted without the borehole collapsing on the logging equipment.

Soil borings would be drilled using a sonic or mini-sonic drill rig. The exact locations of the soil borings would not be known until the results of the surveys have been reviewed; however, it is anticipated that two soil borings would be drilled at each of the survey lines.

The disturbance footprint would be approximately 100 feet by 100 feet for the sonic drill rig and 50 feet by 30 feet for the mini-sonic drill rig and two support vehicles during drilling of the borings (Figures 3 and 4). Once completed, soil borings would be backfilled and the surface would be completed to match the existing surface. Each borehole would be backfilled or plugged within 60 days after it is drilled. Boreholes will remain open until all boreholes are completed to allow for electronic logging to be conducted. Boreholes will be covered with steel plates to prevent wildlife from falling in. If the borehole does not encounter groundwater and the bottom of the borehole is above the expected seasonal high water table, the borehole may be backfilled by filling the borehole from the bottom with uncontaminated soil to within 20 feet of the ground surface. The top 20 feet would be plugged with concrete grout, cement grout, or neat cement to the surface.

If the total depth of the borehole is below the seasonal high water table, concrete grout, cement grout, neat cement, or bentonite grout would be placed by tremie pipe from the bottom of the borehole to within 20 feet of the surface. The upper 20 feet of the borehole would be plugged with concrete grout, cement grout, or neat cement to the surface. If artesian groundwater conditions are encountered, the artesian water strata must be sealed or contained consistent with NAC 534.378. If there is evidence of water-draining formations or water-bearing formations of different water quality, there must be neat cement placed across the water-confining formations to prevent the vertical migration of water.

For consistency with NAC 534.4369, a record of the borehole would be retained in the NERT files and provided to landowners. The records would include dates when the borehole was drilled; location of the borehole; depth and diameter of the borehole; and methods and materials used to plug the borehole.

Drilling, logging, and subsequently plugging the four borings associated with the full-scale GI on Reclamation land is expected to take up to 1 week to complete.⁸

⁸ Timeframe to complete the full-scale GI for the entire Downgradient Study Area is approximately 15 weeks.

2.2.3 Design Features

An appropriate combination of monitoring and resource impact avoidance would be employed during all phases of the Proposed Action, including implementation of the following design features.

General Design Features

- NDEP will obtain all required permits including well drilling permits and other required permits.
- Only biologists approved by Reclamation shall conduct preconstruction surveys or serve as biological monitors. The project proponent shall submit the name(s) and resumes of proposed biologist(s) to Reclamation for review and written approval at least 15 days prior to the onset of activities. No activities shall begin until a biologist is approved by Reclamation and is present at the worksite.
- Worker Environmental Awareness Training will be implemented prior to work. Presentations will be provided by the biologist to all workers who will be present in the Proposed Action areas. A record of all trained personnel will be maintained.
- Biological monitors will be provided throughout all activities excluding well monitoring/sampling in all Proposed Action areas located on Reclamation-managed land.
- Construction, operations and maintenance activities that may affect vegetation or migratory bird nesting habitat during the breeding season (February 15 to September 1) shall be required to conduct nesting bird clearance surveys. If any nesting bird activity is detected, all activities will cease until the biologist determines that no active nests, eggs, nestlings or recently fledged birds will be affected.
- Field crews will use appropriate Stormwater Pollution Prevention Plan Best Management Practices where applicable.
- To prevent the spread of noxious and invasive weeds, equipment used for the Downgradient Study Area will be thoroughly cleaned prior to entering and exiting the Proposed Action areas. The cleaning process will ensure that all dirt and debris that may harbor noxious or invasive weed seeds are removed and disposed of at an appropriate facility. Reclamation's Inspection and Cleaning Manual for Equipment and Vehicles to Prevent the Spread of Invasive Species: 2012 Edition should be referenced for inspection and cleaning activities. The manual is located at: <http://www.usbr.gov/mussels/prevention/docs/EquipmentInspectionandCleaningManual2012.pdf>.
- To prevent increased incidence of wildfire that could degrade or destroy habitat, fire-safe practices will be implemented, including removing vegetation that could ignite, not parking vehicles over dried vegetation, and having fire extinguishers on site at all times.
- Signs will be posted alerting recreational users of temporary roadway or bike path crossings that need to occur for well installation. Flagmen will be used to safely direct traffic during delivery of large pieces of equipment.

- All Proposed Action area boundaries associated with temporary and permanent disturbances will be conspicuously staked, flagged, or otherwise marked to minimize surface disturbance activities. All workers will strictly limit activities and vehicles to the designated Proposed Action areas.
- Prior to conducting vegetation crushing or trimming, a field survey will be conducted by a biologist to verify that no sensitive flora or fauna species are present in the areas where the work will be conducted. It is anticipated that vegetation in an area at least 6 feet wide along the survey lines will have to be crushed or trimmed using hand tools or mechanical equipment. Crushing of vegetation is the preferred method that will be used. No grubbing will be conducted.
- Crushing and trimming of vegetation in Proposed Action areas will be avoided to the maximum extent practicable.
- Trimmings will be removed from the Proposed Action areas by the contractor hired to conduct this work. Trimmings will be disposed of off-site at an appropriate waste disposal facility.
- All trash and food items generated by construction and maintenance activities will be promptly contained and regularly removed from the Proposed Action areas.
- Pets will not be allowed in the Proposed Action areas.
- All work activities will stay within Reclamation-approved Proposed Action areas.
- All vehicles will obey a speed limit of 15 miles per hour.
- Best management practice control measures will be implemented as listed in the Dust Control Handbook (Clark County 2003) to manage soil disturbance and prevent fugitive dust.
- Any incident occurring during the Proposed Action that is considered by the biological monitor to be in non-compliance with these design features will be documented immediately by the biological monitor. The biological monitor will ensure that appropriate corrective actions are taken and will report to Reclamation.
- Results of biological monitoring and status of construction will be detailed in daily reports by the biological monitor.
- Management and disposal of waste materials including, but not restricted to, refuse, garbage, sanitary wastes, industrial wastes, and oil and other petroleum products, would be coordinated with Reclamation's Regional Hazardous Materials Coordinator.
- If hazardous material is found, or any construction or project-associated spills of a gallon or more occur on Reclamation lands and/or projects all operations would cease and local emergency response organizations shall be notified by calling 911. The Reclamation Regional Hazardous Materials Coordinator would be notified within one hour of notifying 911. Construction associated spills less than 1 gallon would be cleaned up immediately and the Reclamation Regional Hazardous Materials Coordinator notified within 24 hours of the spill.

Desert Tortoise-specific Design Features

- A biological monitor, with desert tortoise experience, will be on site for all activities excluding future well monitoring/sampling. If a desert tortoise is encountered at the

NERT Site, work activities shall cease until the tortoise has moved out of the area by its own volition.

- No overnight hazards to desert tortoises (e.g., boreholes, trenches, pits, or other steep-sided depressions) will be left unfenced or uncovered.
- Parked vehicles will be inspected for the presence of desert tortoises prior to being moved.
- Standing water will be minimized to reduce the potential for the Proposed Action to attract opportunistic predators that prey on desert tortoise.

Cultural Resource-specific Design Features

- To the extent possible ground-disturbing activity associated with the Proposed Action will not occur within 75 feet or less of a historic property. An Archaeological Avoidance Plan will be implemented to ensure historic properties are avoided during implementation of the Proposed Action. An Archaeological Inadvertent Discovery Plan will also be prepared, outlining measures to follow if archaeological resources are discovered during the course of the Proposed Action activities. If deemed necessary by Nevada State Historic Preservation Office (SHPO) or the Reclamation, archaeological monitoring may be employed to assist with avoidance measures.

2.3 Alternatives Considered but Not Evaluated in Detail

Groundwater sampling using existing wells, surface water sampling, and a geophysical pilot test have already occurred at the NERT Site. These investigations have helped develop the proposed approach and locations for groundwater well installation, groundwater sampling, and full-scale GI. No conflicts for the Proposed Action with respect to the need for alternative uses of available resources exist. Therefore, the installation of new wells, conducting a full-scale GI, and drilling of verification soil borings provide the most appropriate and reasonable approach to identifying subsurface pathways within the Downgradient Study Area through which perchlorate-impacted groundwater is entering the Las Vegas Wash.

No alternative subsurface investigation methods were considered because installation of groundwater wells provides the most reliable method of collecting groundwater data over time. In addition, geophysical investigation methods and the drilling of new wells and soil borings are minimally invasive investigation methods and they provide detailed information needed for the objectives of the Downgradient Study Area.

The Downgradient Study Area investigation could be implemented without the use of Reclamation-managed land. However, as a result, this would prevent the identification of some potential areas where perchlorate-impacted groundwater is entering the Las Vegas Wash, thus hampering efforts to understand the extent of perchlorate contamination in groundwater. This would ultimately slow the ability to implement a comprehensive remedial action designed to reduce the migration of perchlorate from groundwater to the Las Vegas Wash. Implementation of a less comprehensive remedial action would not be as effective for addressing the impact on the groundwater system.

3.0 Affected Environment and Environmental Consequences

This section includes information for each resource potentially affected by the Proposed Action and a discussion of environmental consequences of the Proposed Action and No Action alternatives.

The analysis of the Proposed Action will include direct, indirect, and cumulative effects. The CEQ regulations define direct effects as those which are caused by the action and occur at the same time and place and indirect effects as those which are caused by the action and occur later in time or farther removed in distance.

Cumulative impacts are defined as impacts to the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes the action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (Title 40 CFR, Section 1508.7).

The cumulative effects analysis will address the cumulative impacts of the Proposed Action in combination with other projects or management activities. Section 3.1 identifies past, present, and reasonably foreseeable activities that are either located in the vicinity of the NERT Site or have been identified as having the potential for cumulative impacts when considered in addition to the impacts of the Proposed Action. These actions will be addressed as appropriate in each section.

The analysis areas for potential direct impacts are the Proposed Action area (as shown in Figure 1). The analysis areas for indirect and cumulative impacts are Clark County Wetlands Park and the entire Downgradient Study area. The analysis of impacts to biological resources included the Proposed Action area plus a 100-foot buffer referred to as the Action Area (as shown on Figures 8 and 9).

3.1 Past, Present, and Reasonably Foreseeable Future Projects

3.1.1 Clark County Wetlands Park

The 2,900-acre Clark County Wetlands Park was established in 1991. It is comprised of a 210-acre nature preserve, nature center, and multiple trails that surround the Las Vegas Wash. The Las Vegas Wash bisects the Wetlands Park on its 12-mile flow downstream to Lake Mead. The Wetlands Park includes land owned by Reclamation and Clark County. Reclamation-managed land that is part of the Wetlands Park is managed by Clark County through an agreement with Reclamation.

3.1.2 Weir Dewatering

The Southern Nevada Water Authority's (SNWA) Sunrise Mountain and Historic Lateral Weir Construction Project is constructing two weirs in the Las Vegas Wash. NERT has been ordered by NDEP to treat groundwater extracted by SNWA. To facilitate the weir construction, removal

of shallow groundwater is required in the construction areas (Weir Dewatering Treatment Project) (Tetra Tech 2017a). The treatment system for the Weir Dewatering Treatment Project consists of concrete pads, piping, tanks, and control equipment for two pump stations and a centralized water treatment plant. Groundwater generated from the Sunrise Mountain Weir will be transferred to the Sunrise Mountain Pump Station and groundwater from the Historic Lateral Weir will transferred to the Historic Lateral Pump Station. Water from the pump stations will be transferred to the centralized water treatment plant to remove sediments and perchlorate. The treated water will then be discharged into the Las Vegas Wash. Portions of the Weir Dewatering Treatment Project (Contract No. 16-07-30-L0850C) occur on land under the jurisdiction of Reclamation and managed by Clark County. The Sunrise Mountain Weir and the Historic Lateral Weir Expansion is located directly adjacent to the southern portion of the Wetlands Park loop trail. The location and components of the Weir Dewatering Treatment Project are shown on Figure 1.

3.1.3 Entire Downgradient Study Area Investigation including City of Henderson and Clark County Land

The entire Downgradient Study Area investigation would occur on land comprised of both Reclamation-managed lands and lands owned by Clark County and the City of Henderson. A total of approximately 10 Phase I and 13 Phase II monitoring wells would be installed for the entire Downgradient Study Area. The total full-scale GI survey lines total approximately 25,800 feet, with a total of 20 soil borings occurring along the survey lines.

The installation and sampling of the 10 Phase I wells is anticipated to take approximately 8 weeks, the installation and sampling of the 13 Phase II wells is anticipated to take approximately 10 weeks, and the 20 soil borings associated with the full-scale GI are expected to take up to 15 weeks to complete. Minimum and maximum disturbance acreages and land ownerships are provided in Table 2. The procedures for conducting this work are described in Section 2.2.

Table 2. Entire Downgradient Study Area Land Ownership and Minimum and Maximum Disturbance Acreages

	Reclamation	Clark County	City of Henderson	Total	Minimum Disturbance (acres)	Maximum Disturbance (acres)
Phase I Wells*	3	7	0	10	0.34	2.30
Phase II Wells*	6	7	0	13	0.45	2.98
Full Scale GI Survey Line (feet)	10,100	12,700	3,000	25,800	3.55**	77.0**
GI Soil Verification Borings*	4	12	4	20	0.69	4.59

* Minimum footprint for mini-sonic drill rig is 50 feet by 30 feet. Maximum footprint for full-size rotary sonic rig is 100 feet by 100 feet.

** The survey equipment would be laid out approximately 6 feet to 130 feet from the survey line.

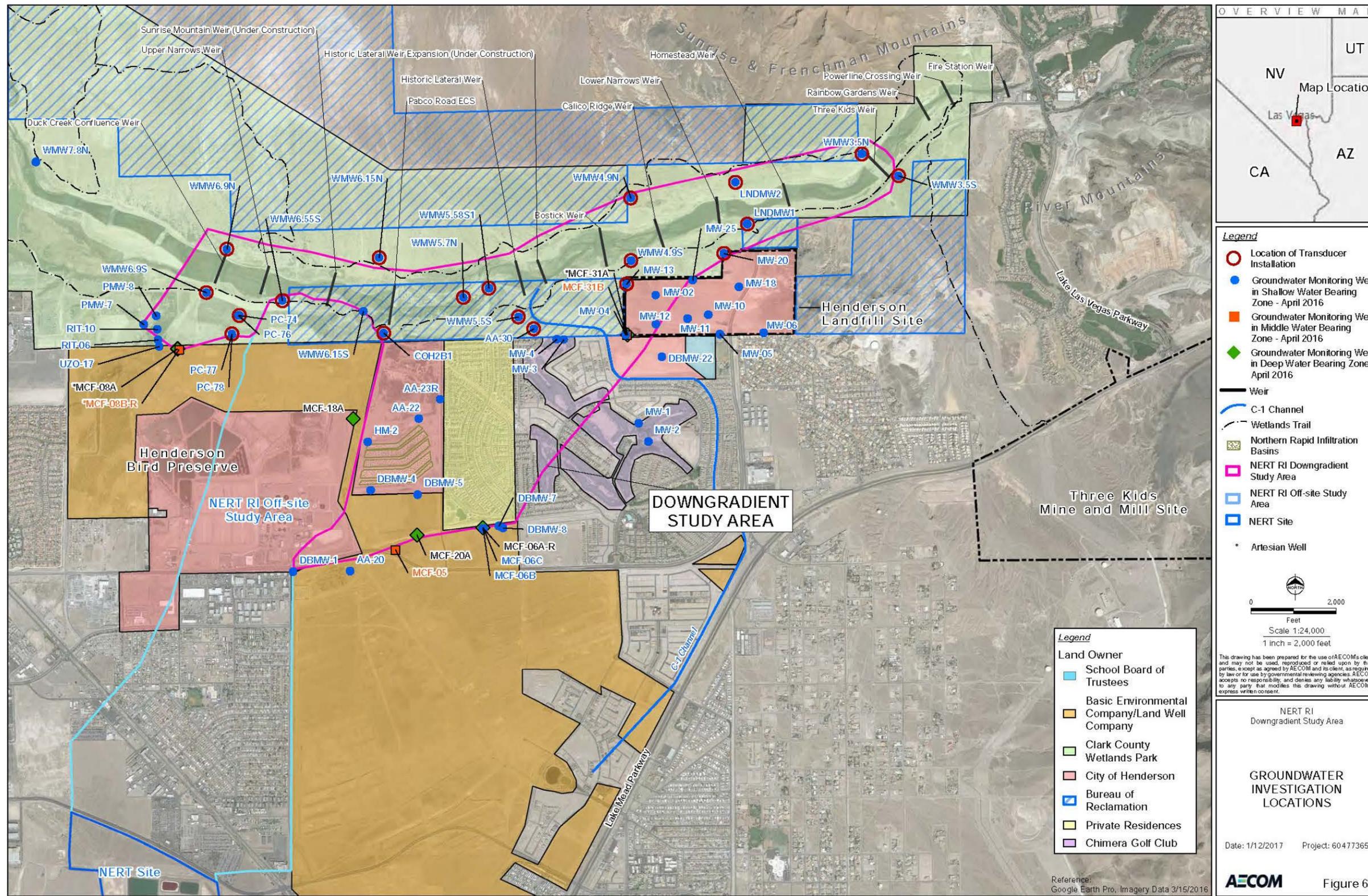


Figure 6. Groundwater Investigation Locations

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Existing groundwater wells within the Downgradient Study Area were included in groundwater monitoring conducted by AECOM in April 2016. A total of 61 wells were sampled to assess concentrations of perchlorate (as well as six other constituents) in groundwater (Figure 6). Sampling activities consisted of driving to the wells on existing roads and collecting a groundwater sample using a pump to bring the water to the surface. These activities were minimally invasive and did not create disturbance of the areas surrounding the wells.

In May 2017, 19 transducers were installed in existing wells along the Las Vegas Wash (Figure 6). The transducers continuously recorded data for a period of 6 months. Monthly monitoring of these wells will be conducted to collect manual groundwater level measurements, and on a quarterly basis, data will be downloaded from the transducers. Like the groundwater sampling event, these activities require driving to these wells on existing roads. Monitoring of these wells and data downloads are minimally invasive, and do not cause disturbance of the areas surrounding the wells.

Implementation of the entire Downgradient Study Area Investigation would provide understanding of the extent of perchlorate contamination in the groundwater. This would ultimately allow implementation of a comprehensive remedial action designed to reduce the migration of perchlorate from groundwater to the Las Vegas Wash.

3.2 Resources Considered but Not Discussed Further

The following resources were considered and are not addressed further in this EA because there would be no impacts from the Proposed Action:

Environmental Justice - EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority and low-income populations. In accordance with CEQ guidance, minority populations should be identified if “the minority population in the project area exceeds 50 percent” or if the percentage of minority population in the project area is meaningfully greater than the “minority population percentage in the general population or other appropriate unit of analysis”. Communities should be identified as “low income” based on the annual statistical poverty thresholds from the U.S. Census Bureau (CEQ 1997). The project area for analysis includes the Proposed Action area and Downgradient Study Area. No high and adverse human health or environmental effects were identified from the Proposed Action, but data on minority populations and poverty in the project area were reviewed to assure compliance with the EO. U.S. Census Bureau data on minority populations and poverty for the Proposed Action area were compared to the same data for the state of Nevada and Clark County (U.S. Census Bureau 2015). Minority populations in the three zip codes (89122, 89011, and 89156) did not exceed 50 percent; therefore, the project area did not meet the thresholds identified for Environmental Justice analysis. The percent of individuals below poverty levels in the zip codes were compared to those for Nevada and Clark County. The poverty levels were either below or only slightly higher than those for Nevada and Clark County. Therefore, the Proposed Action would not result in disproportionately high

and adverse human health or environmental effects on minority and low-income populations.

- **Floodplains and Wetlands** - EO 11988, Floodplain Management (1977), and EO 11990, Protection of Wetlands (1977), direct federal agencies to consider potential impacts to floodplains and wetlands and to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to minimize the destruction, loss or degradation of wetlands. The Proposed Action is located within the floodplain of the Las Vegas Wash, which also contains wetlands. The only structures located within the floodplain would be wells and soil borings which would not impede the overall function of the floodplain. Implementation of the Proposed Action would also avoid disturbance to wetlands. The Proposed Action would result in beneficial effects associated with identifying subsurface pathways through which perchlorate-impacted groundwater is entering the Las Vegas Wash, so these pathways can be addressed in future groundwater remedial actions. Therefore, no adverse impacts to these resources would occur.
- **Human Health** - The Proposed Action would have beneficial human health impacts as it would monitor and collect data to identify subsurface pathways through which perchlorate-impacted groundwater is entering the Las Vegas Wash. These results would inform appropriate remediation. Therefore, no adverse impacts to human health would occur.
- **Indian Trust Assets (ITA)** - ITA are defined as “legal interests in property held in trust by the United States for Indian tribes or individuals” (Reclamation 1993). ITAs are those properties, interests, or assets of a federally recognized Native American tribe or individual Native American over which the federal government also has an interest, either through administration or direct control. Examples of ITAs include lands, minerals, timber, hunting rights, fishing rights, water rights, in-stream flows, and other treaty rights. All federal bureaus and agencies are responsible for protecting ITAs from adverse impacts resulting from their programs and activities. There are no known ITAs or treaty rights exercised by tribes in the Proposed Action area (U.S. Census Bureau 2016). As such, no adverse impacts to ITAs would occur.
- **Noise** - In the event that soil borings and well installations are drilled along geophysical survey line 5, sonic drilling required for these activities may potentially occur within approximately 125 feet north of existing residences. Homes are considered noise-sensitive land uses; however, noise generated by sonic drilling would be temporary and intermittent. In addition, sonic drilling would occur during daylight hours, within the schedule dictated by the local City of Henderson noise ordinance (Title 8 Chapter 8.84 Section 30). Therefore, Proposed Action activities would not result in permanent changes to existing noise levels or the ambient noise environment of the Downgradient Study Area.
- **Soil** - The Proposed Action would install approximately three Phase I and six Phase II monitoring wells and perform four GI soil verification borings on Reclamation-managed lands. Additionally, minimal soil disturbance would occur during the full-scale GI survey; stakes, various electrodes and geophones would be inserted into the ground to a maximum depth of 10 inches. The maximum disturbance footprint per well would be approximately 100 feet by 100 feet (excluding access route) for the

drill rig during drilling of the soil borings and wells. Once completed, soil borings would be backfilled, and the surface would be completed to match the existing surface. Final well construction would be determined after the borings have been drilled and the geologist has determined the soil conditions. The screen interval would be placed based on the lithology at the time the well is drilled. Once completed, the approximate ground area of each well would be 4 feet by 4 feet (inclusive of the concrete well pad and four bollards). Existing roads would be used to access drilling locations to limit disturbance of surface soil. Additionally, soil borings and new well installations may generate soil cuttings, which would be contained, transported, and disposed of in accordance with local, state, and federal regulations. Disturbance of surface soil conditions on the proposed access routes would be minimal. Therefore, Proposed Action activities would not adversely affect surface soil conditions or stability.

- **Surface and Groundwater Quality and Quantity** - The Proposed Action is located within the floodplain of the Las Vegas Wash. The final locations of soil borings and new well installations shall be determined in consultation with the SNWA to assure that such activities would not interfere with the Las Vegas Wash or its tributaries. No other water bodies are located in the vicinity of Proposed Action activities. The geophysical surveys are non-invasive and would have minor impacts on existing surface features (i.e., vegetation and surface soil).

The objective of the Proposed Action is to identify subsurface pathways within the Downgradient Study Area, through which perchlorate-impacted groundwater is entering the Las Vegas Wash. New well installation and development, as well as initial groundwater sampling, may generate a minimal amount of purge water, which would be contained, transported, and disposed of in accordance with local, state, and federal regulations. However, Proposed Action activities would not adversely affect groundwater quality or quantity nor exacerbate existing conditions. The disturbance footprint of each wellhead would consist of a 4-foot by 4-foot area, and the wellhead would be secured with a locking cap. Approximately three Phase I and six Phase II monitoring wells would be installed on Reclamation-managed lands. Due to the small area that would be disturbed and the fact that the well would not contribute to surface water, there would be no adverse effect to surface water quality or quantity as the result of this Proposed Action.

- **Socio-economic** - The Proposed Action would have a beneficial socio-economic impact to the residents of the City of Henderson and Clark County. Identifying subsurface pathways where perchlorate-impacted groundwater is entering the Las Vegas Wash would enhance the opportunities for remediation which would improve the local groundwater quality and environment. Therefore, Proposed Action activities would not result in adverse socio-economic impacts.
- **Traffic Control** - Minimal vehicle traffic exists near the NERT Site. The area is primarily used for pedestrian, bike, and equestrian activities along the Clark County Wetlands Park loop trail. Under the Proposed Action, signs would be posted alerting recreational users of temporary roadway or bike path crossings that need to occur for well installation. Flagmen would be used to safely direct traffic during delivery or removal of large pieces of equipment. No adverse effects to traffic would occur.

3.3 Resources Discussed Further

The following resources are discussed further in this EA as there may be some potential impacts associated with these resource areas:

- Air Quality
- Biological Resources
- Cultural Resources/Traditional Cultural Properties/Sacred Sites
- Recreation
- Visual Resources

3.3.1 Air Quality

3.3.1.1 Affected Environment

The EPA establishes National Ambient Air Quality Standards (NAAQS) for the following common air pollutants: ozone (O₃), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter measuring less than 2.5 microns and less than 10 microns (PM^{2.5} and PM¹⁰, respectively), and lead (Pb). The EPA has developed primary and secondary NAAQS for these air pollutants to protect human health and prevent environmental and property damage.

Areas of the country that are currently in violation of NAAQS are classified as non-attainment areas; new sources to be located in or near these areas are typically subject to more stringent air permitting requirements than similar sources in attainment areas. The Clark County Department of Air Quality (DAQ) implements and enforces the air pollution program in Clark County. Clark County is in attainment or unclassifiable for PM^{2.5}, SO₂, Pb, NO₂, and O₃. The county is a maintenance area for CO and PM¹⁰ (DAQ 2017).

3.3.1.2 Environmental Consequences

No Action Alternative

The No Action Alternative would not change a substantial amount of emissions or particulate matter released into the air. Installation and ground-disturbing activities would occur only on Clark County and City of Henderson-owned lands, not Reclamation-managed lands. No adverse impacts associated with air quality are anticipated.

Proposed Action Alternative

The Phase I and Phase II well installation on Reclamation-managed lands would include installation of nine groundwater monitoring wells to depths of up to 120 feet using one rotary-sonic drill rig. In addition, the GI on Reclamation-managed land includes drilling four verification borings along four geophysical survey lines. A sonic drill rig will be used to drill the new wells and the verification soil borings. Additional equipment includes two support vehicles (utility trucks).

An emissions analysis of the maximum potential annual activity of on-site sources (i.e., drill rig and support trucks and fugitive dust generation during drilling activities) and off-site sources (i.e., mobile source emissions from vehicle travel on paved and unpaved roads) was conducted for construction activities. The results of the construction emissions analysis is presented in Table 3.

Table 3. Construction Emissions for the Proposed Action

Emissions Sources	VOC	NO _x	CO	PM ¹⁰ ²
Total Emissions (tons/year)	0.06	0.71	0.21	0.16
De Minimis Threshold ¹	100	100	100	100
Exceeds Thresholds	No	No	No	No

Notes: ¹ General Conformity *De Minimis* Tables for Maintenance Areas (EPA 2017)

² Particulate matter (PM) emissions do not account for reductions associated with control measures listed in the DAQ's Dust Control Handbook (2003).

CO = carbon monoxide; NO_x = oxides of nitrogen; PM¹⁰ = PM with aerodynamic diameter less than 10 microns; VOC = volatile organic compounds

As shown in Table 3, maximum daily emissions of air pollutants generated by construction activities would not exceed any of the *de minimis* thresholds. Thus, construction activities would not cause an air quality violation.

Operation of the Proposed Action would not result in any new substantial sources of air pollutants. Proposed Action activities would be temporary and would occur intermittently over several months. Once the wells are installed, groundwater samples would be collected up to four times per year. Transducer data would be downloaded quarterly, and groundwater level measurements would be collected monthly for each well. Each monitoring well is anticipated to be used for 10 to 20 years. In addition, the numbers of workers, equipment, and vehicles necessary to execute the work would be minimal. Table 4 shows annual criteria air pollutant emissions associated with one year of operation. The analysis conservatively assumed 2018 as an operational year; operational activities including plugging of one well and associated equipment and workers; measurements of groundwater levels and collection of quarterly groundwater samples. Given that exhaust emissions from the construction equipment fleet are expected to decrease over time, as stricter standards take effect, advancements in engine technology, retrofits, and turnover in the equipment fleet are anticipated to result in lower levels of emissions if activities involving construction equipment (i.e. drill rigs) occurs in later years. The operational emissions presented in Table 4 are conservative.

Table 4. Operational Emissions for the Proposed Action

Emissions Sources	VOC	NO _x	CO	PM ¹⁰ ²
2018 Total Emissions (tons/year)	<0.01	0.03	0.01	0.01
De Minimis Threshold ¹	100	100	100	100
Exceeds Thresholds	No	No	No	No

Notes: ¹ General Conformity *De Minimis* Tables for Maintenance Areas (EPA 2017)

² Particulate matter emissions do not account for reductions associated with control measures listed in the DAQ's Dust Control Handbook (2003).

CO = carbon monoxide; NO_x = oxides of nitrogen; PM¹⁰ = PM with aerodynamic diameter less than 10 microns VOC = volatile organic compounds

As shown in Tables 3 and 4, construction and operational emissions would be well below the *de minimis thresholds*. Additionally, as stated in Section 2.2.3, the Proposed Action would implement best management practice control measures as listed in the Dust Control Handbook (2003) to manage soil disturbance and prevent fugitive dust. Therefore, Proposed Action activities are not anticipated to generate emissions in amounts that would adversely affect the public or environment.

Cumulative Impacts

The entire investigation within the Downgradient Study Area would include the installation of a total of approximately 10 Phase I wells and 13 Phase II wells. The installation for the 10 Phase I wells is anticipated to take approximately 8 weeks and the installation of the 13 Phase II wells is anticipated to take approximately 10 weeks. During Phase I, two new dirt access paths would be created over undeveloped land, totaling approximately 200 feet in length (total disturbed area approximately 0.2 acres) to reach two proposed Phase I groundwater monitoring well locations (NERT4.38N1 and NERT4.21N1) north of the Las Vegas Wash (Figure 2).

Additionally, the full-scale GI soil verification borings for the entire Downgradient Study Area would require a total of 20 borings. These 20 borings associated with the full-scale GI are expected to take up to 15 weeks to complete.

An air pollutant emissions analysis of maximum annual construction activities for the entire Downgradient Study Area did not result in a substantial contribution to an air quality violation. Table 4 presents the emissions associated with construction activities for the entire Downgradient Study Area. The emissions analysis conservatively assumed all work would occur in 2018. Table 5 also presents the estimated emissions from the generators at the Weir Dewatering Treatment System. As previously discussed, drilling of the wells and borings for the entire Downgradient Study Area would be temporary, and groundwater sampling and pumping tests would be temporary and occur intermittently throughout the year over a period of 10 to 20 years. Additionally, the entire Downgradient Study would implement best management practice control measures to manage soil disturbance and prevent fugitive dust. As shown in Table 5, construction and operational-related emissions associated with cumulative activities at the Downgradient Study Area would not exceed the *de minimis* thresholds.

Table 5. 2018 Cumulative Emissions

Emissions Sources	VOC	NO _x	CO	PM ¹⁰ ¹
Downgradient Study Area (tons/year) ²	0.19	2.11	0.60	0.49
Weir Dewatering Treatment System (tons per year) ³	0.56	45.11	2.15	0.73
Operational Emissions (tons/year) ⁴	<0.01	0.03	0.01	0.01
Total Emissions (tons/year)	0.75	47.25	2.76	1.23
<i>De Minimis</i> Threshold ⁵	100	100	100	100
Exceeds Thresholds	No	No	No	No

Notes:

¹ Particulate matter emissions do not account for reductions associated with control measures listed in the DAQ's Dust Control Handbook (2003).

² Emissions for the entire Downgradient Study Area were estimated by scaling the number of wells (9) and borings (4) on Reclamation-managed land to the total number of wells and borings, 23 and 20, respectively.

³ Weir Dewatering Treatment System emissions provided by Tetra Tech (2017b). Emissions presented are potential to emit emissions based on conservative estimates as part of local air quality permitting.

⁴ Operational activities conservatively include plugging of one well and associated equipment and workers, and measurements of groundwater levels and collection of groundwater samples.

⁵ General Conformity *De Minimis* Tables for Maintenance Areas (EPA 2017)

CO = carbon monoxide; NO_x = oxides of nitrogen; PM¹⁰ = PM with aerodynamic diameter less than 10 microns; VOC = volatile organic compounds

Thus, cumulatively, construction and operation of the Proposed Action with the Weir Dewatering Treatment Project and entire Downgradient Study would also not result in any new substantial sources of air pollutants. The Proposed Action would not result in any adverse cumulative air quality impacts.

3.3.2 Biological Resources

3.3.2.1 Affected Environment

The Proposed Action on Reclamation lands was designed to create as little disturbance as possible to the existing resources. The Proposed Action including GI lines, soil borings, and well locations will be located on existing roads and in previously disturbed areas. Additionally, construction of the Weir Dewatering Treatment Project began in late September 2017 and this construction has re-disturbed previously disturbed areas where proposed GI lines 5 and 6 will be located.

Vegetation is sparse in the Project Area. The vegetation consists mostly of annual Buckwheat species (*Eriogonum* sp.) and nonnative, invasive vegetation, including Russian thistle (*Salsola tragus*) and nonnative grasses.

The Proposed Action occurs in upland habitat outside of any habitat suitable for southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*) and Yuma clapper rail (*Rallus longirostris yumanensis*). Reclamation has determined there will be no effect to these species from the Proposed Action and they will not be analyzed further.

Migratory birds protected by the MBTA are known to occur in the project Area.

Desert Tortoise

Desert tortoise is federally threatened and a state-protected species. A desert tortoise protocol survey for the Proposed Action was conducted in April 2017. There is no desert tortoise designated critical habitat in the Project Area. The survey was performed in accordance with U.S. Fish and Wildlife Service (Service; 2010) survey protocols (Figures 8 and 9). No desert tortoise or tortoise signs were observed.

An incidental observation of a live desert tortoise in the Downgradient Study Area was reported by an SNWA biologist on March 28, 2017 (personal communication from Carlton Parker, NDEP). Attempts by AECOM in coordination with NEDP to locate the March 28 tortoise again were unsuccessful. The location where the desert tortoise was sighted is within the project footprint of the NERT Dewatering project and has been cleared and grubbed.

Reclamation's federal action, which is issuance of a ROU contract, is limited to Reclamation managed lands. The remainder of the Downgradient Study Area occurs on lands managed under the Clark County Multiple Species Conservation Plan Section 10 (a)(1)(B) permit TE034927-0.

3.3.2.2 Environmental Consequences

No Action Alternative

There would be no impacts to biological resources from the No Action Alternative.

Proposed Action Alternative

The Proposed Action was designed to minimize biological impacts by utilizing previously disturbed habitat including existing roads. Minimal vegetation disturbance will occur as a result of the Proposed Action. Design features for the project will minimize the chance for introduction and spread of invasive species.

Desert Tortoise

No impacts to desert tortoises are anticipated. No desert tortoise or tortoise sign were observed during the April 2017 survey. No new habitat disturbance will occur as a result of the Proposed Action. Desert tortoise worker education and awareness training will be required for all personnel working on the project. A biological monitor, with desert tortoise experience, will be on site for all activities excluding future well monitoring/sampling. If a desert tortoise is encountered at the NERT Site, work activities shall cease until the tortoise has moved out of the area by its own volition.

Reclamation has determined that the Proposed Action may affect, but is not likely to adversely affect, desert tortoise. Reclamation will informally consult with the USFWS.

Construction, operations, and maintenance activities that may affect vegetation or migratory bird nesting habitat during the breeding season (February 15 to September 1) shall be required to conduct nesting bird clearance surveys. If any nesting bird activity is detected, all activities will cease until the biologist determines that no active nests, eggs, nestlings or recently fledged birds will be affected.

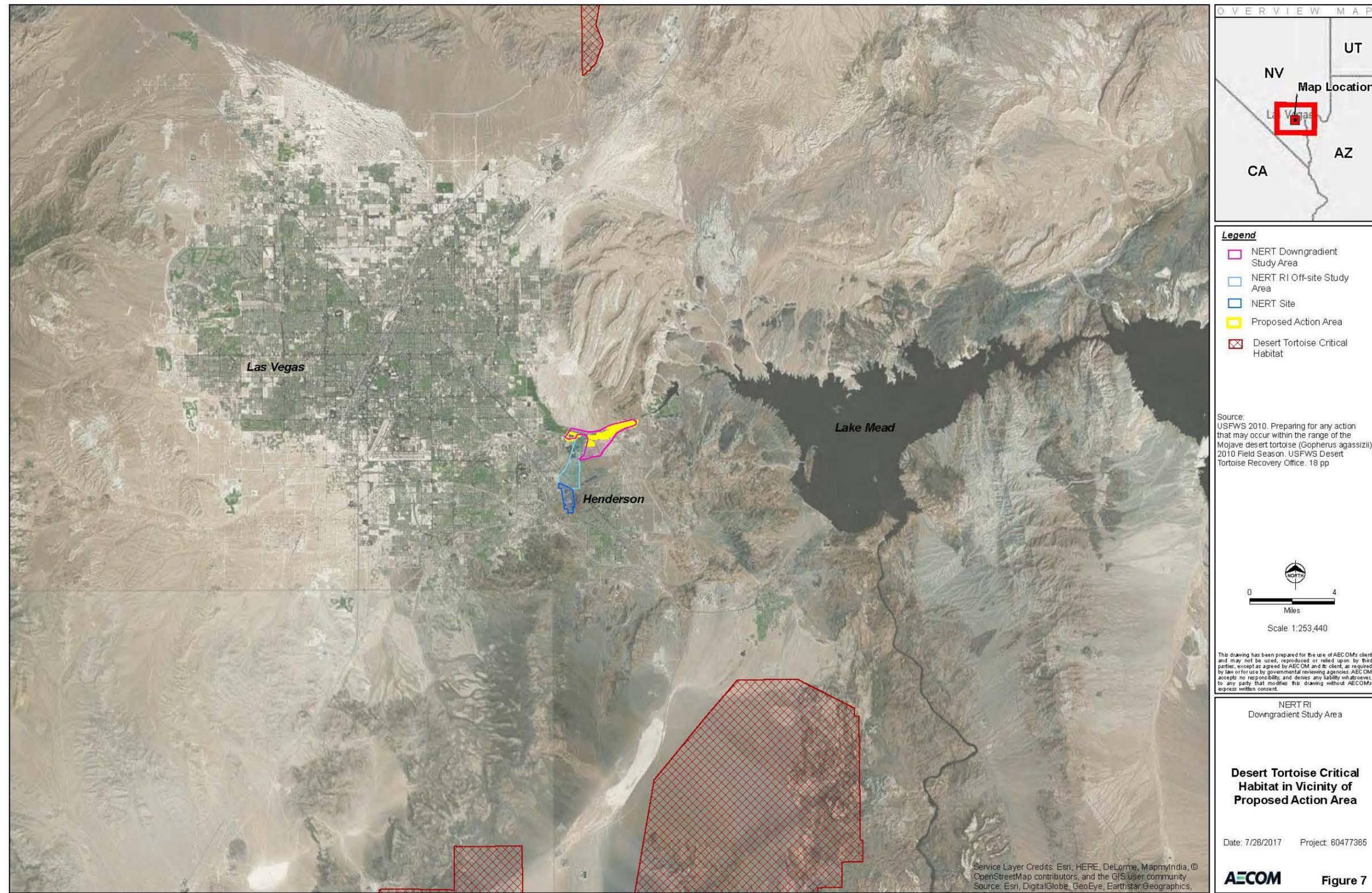


Figure 7. Desert Tortoise Critical Habitat in Vicinity of Proposed Downgradient Study Area

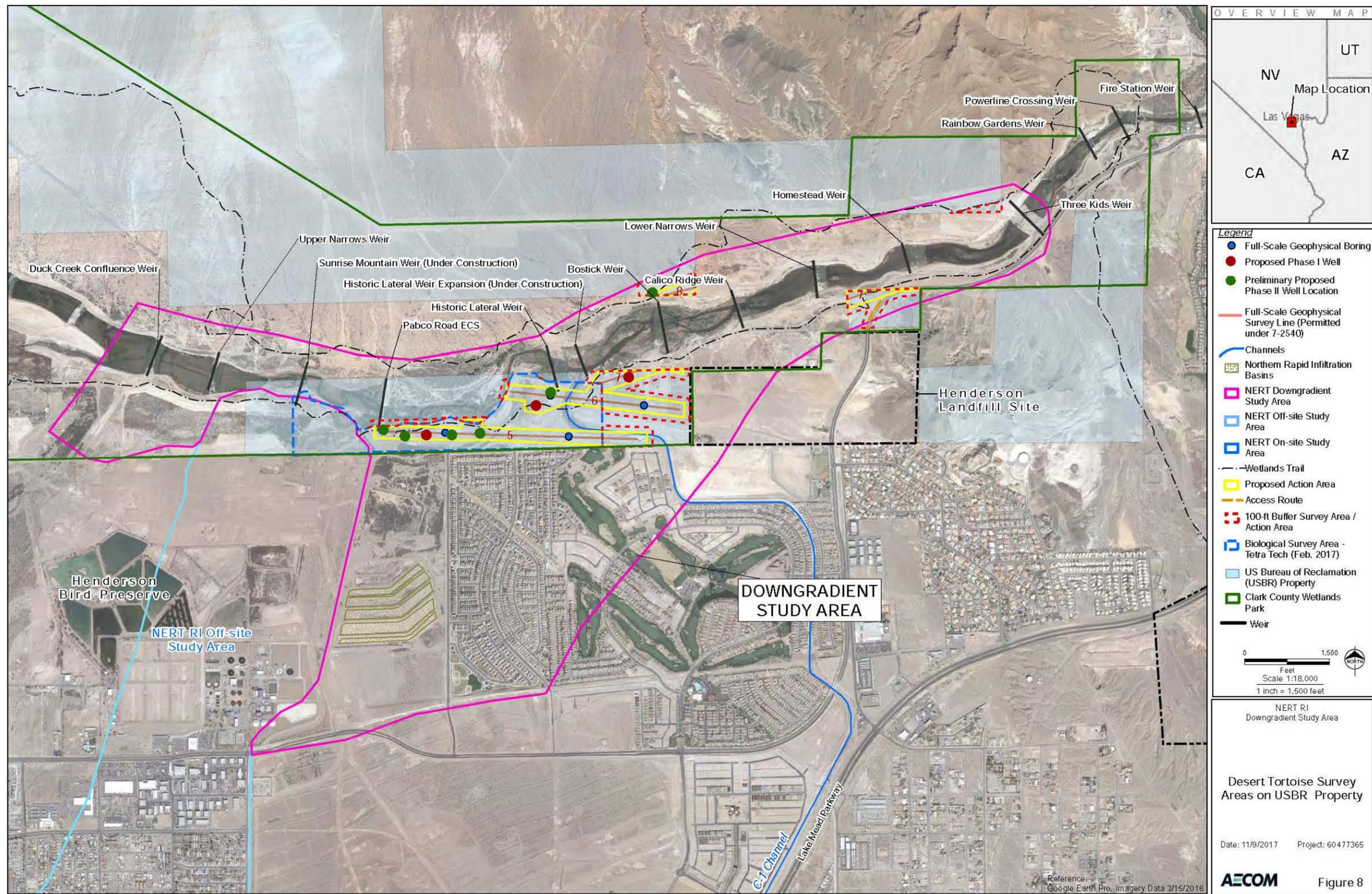


Figure 8. Desert Tortoise Survey Areas on Reclamation Managed Lands

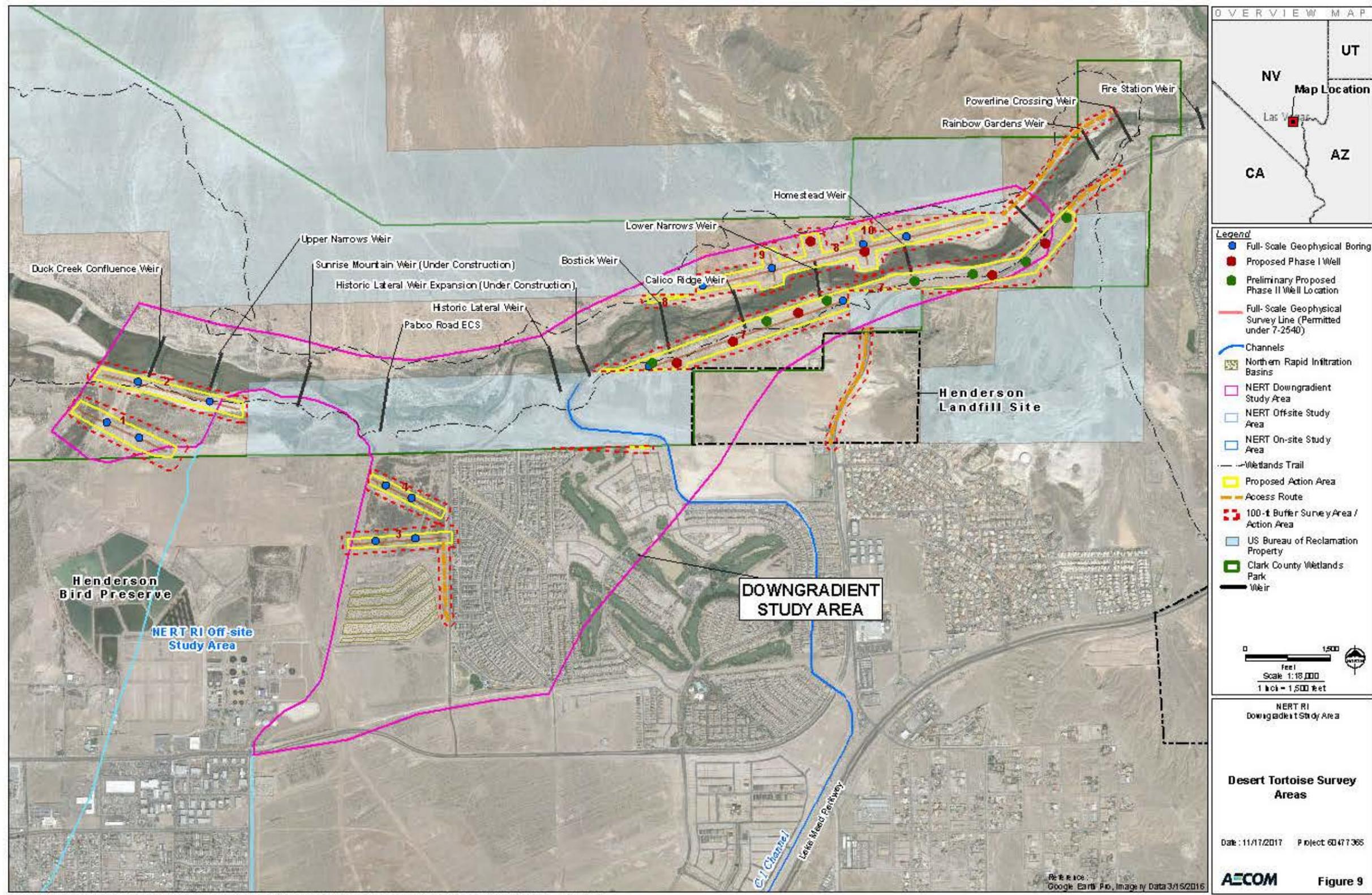


Figure 9. Desert Tortoise Survey Areas

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Cumulative Impacts

The entire Downgradient Study was designed to minimize impacts to biological resources. All activities both on Reclamation and other managed lands will occur on existing roads or disturbed areas. Coverage for desert tortoise on lands not managed by Reclamation would be addressed through the Clark County Multiple Species Conservation Plan Section 10 (a)(1)(B) permit TE034927-0.

Desert tortoise surveys were conducted for all areas in the Downgradient Study where there will be ground disturbing activities (Figure 9). No desert tortoise were detected. There is no designated critical habitat for desert tortoise in the Downgradient Study Area.

No adverse impacts to desert tortoise or migratory birds are anticipated, therefore no detectable incremental impact would result from the Proposed Action to the past, present or reasonably foreseeable actions. No detectable cumulative impacts to the above biological resources are anticipated.

3.3.3 Cultural Resources/Traditional Cultural Properties/Sacred Sites

3.3.3.1 Affected Environment

The Proposed Action is defined as an Undertaking and will require compliance with Section 106 (54 U.S. Code 306108) of the National Historic Preservation Act (NHPA) and its implementing regulations (Title 36 CFR Section 800). Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license or approval.

Compliance with Section 106 of the NHPA is a primary regulatory requirement for this Proposed Action. However, there are additional federal laws and regulations applicable to this Undertaking including the Archaeological Resources Protection Act of 1979 (16 U.S. Code 470aa-470mm; Public Law 96-95) and the Native American Graves Protection and Repatriation Act (25 U.S. Code 3001- 3013). The State of Nevada has established state laws and regulations for the protection of cultural resources which under some circumstances apply to federal undertakings as well (Nevada Revised Statutes 383.150 and 451.045 383).

Section 106 of the NHPA requires federal agencies to consider and evaluate the effects that Undertakings may have on historic properties under their jurisdiction. The term “historic property” means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (National Register) maintained by the Secretary of the Interior.

This term includes artifacts, records, and remains that are related to and located within such properties. The term eligible for inclusion in the National Register includes properties formally determined so in accordance with regulations of the Secretary of the Interior, and properties that have been determined to meet the National Register criteria, but have not been formally nominated for inclusion in the National Register.

EO No. 13007 “Indian Sacred Sites” requires Reclamation to accommodate access to and ceremonial use of Traditional Cultural Properties and Sacred Sites, and avoid adversely affecting their physical integrity. Properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria are also defined as historic properties.

Identification of Historic Properties

Cultural resources surveys and site investigations in the Wetlands Park have provide important information about the prehistory that has regional significance. The majority of the prehistoric sites in the Wetlands Park, on and off Reclamation-managed land, provide evidence of human activity for the past 2,000 to 3,000 years. A site in particular, called the Larder Site, revealed that Native Americans stored food in buried storage pits. Pollen analysis of sediment in pits revealed that native plants, as well as domesticated plants such as maize, were stored there. Radio-carbon dates indicate the Larder Site was occupied by Native Americans between 200 B.C. and A.D. 1500. Two other sites in the Wetlands Park, the Three Kids Pithouse Site and the Bee Hive Rockshelter, also provide evidence of Native American occupation.

Early in the twentieth century the Wetlands Park was homesteaded by the Bishop Family. Archaeological surveys discovered foundation remains of structures at the Bishop Ranch. An intact masonry cellar was discovered and excavated. The cellar was deconstructed and moved to the Clark County Museum in Henderson, Nevada, where was reconstructed and is now on public display

Reclamation’s efforts to identify and evaluate the National Register eligibility of cultural resources in the Wetlands Park dates to the 1970s. The first formal Reclamation-sponsored surveys in the Wetlands Park were conducted for the Colorado Salinity Basin Control Project and the Navajo-McCullough Project. They resulted in the identification of 30 cultural resource sites. The density and complexity of the sites stimulated the establishment of the Las Vegas Wash Archaeological District (District), which was listed on the National Register in 1978.

In 2000, Reclamation leased 1,151 acres of federal land for public recreation and education facilities to Clark County Department of Parks and Recreation for the Wetlands Park. Beginning in 2000, Reclamation renewed agency efforts to conduct archaeological investigations in Wetlands Park through agreements with the SNWA and Clark County Department of Parks and Recreation. Reclamation has been funding and providing other support related to recreation development, weir construction, and vegetation projects in the Wetlands Park. The boundary of the District coincides with that of the Wetlands Park.

In 2011, Reclamation executed a cultural resources programmatic agreement⁹ (PA) for Undertakings in the Wetlands Park. The PA spells out the terms of a formal, legally binding agreement among Reclamation, SNWA, the county, the U.S. Army Corps of Engineers, and the SHPO. It establishes a process for consultation, review, compliance, and the treatment and

⁹ Programmatic Agreement among Reclamation, U.S. Army Corps of Engineers, the Advisory Council on Historic Preservation, the Nevada State Historic Preservation Office, Clark County, Nevada, and SNWA Regarding Implementation of the Clark County Wetlands Park.

preservation of historic properties. Through informal discussions with the SHPO, the PA can be used for consultation, review, compliance, and the treatment and preservation of historic properties in the area of potential effect.

In fulfillment of a requirement in the PA, a Cultural Resources Coordinating Committee (CRCC) was established for the Wetlands Park. The purpose of the CRCC is to provide oversight and guidance on preservation, public education and interpretation of the historic properties within the Wetlands Park. The CRCC consists of representatives from Reclamation, SNWA, the county, the U.S. Army Corps of Engineers, and the SHPO. Another requirement of the PA was the development of a cultural resources management plan. Its development was overseen by the CRCC. It provides guidance for the long-term management and research of historic properties in the Wetlands Park.¹⁰

3.3.3.2 Environmental Consequences

As defined in Title 36 CFR Part 800.16(d) of Section 106 of the NHPA, the area of potential effects is the geographic area or areas within which an undertaking may directly or indirectly cause effects to historic properties. Those sites that have been determined to not be National Register eligible are not historic properties. Under Section 106 of the National Register of Historic Places agencies are not required to protect and preserve these sites. On the other hand, agencies are required to determine effect to historic properties following the procedures in Title 36 CFR Part 800.5-*Assessment of Adverse Effects*.

No Action Alternative

Under the No Action Alternative, Reclamation would not issue authorization to NDEP for the investigation of surface water and groundwater impacts on Reclamation-managed land within the Downgradient Study Area and no drilling, geophysical surveys, or ground disturbance would occur on Reclamation-managed land. There would be no undertaking to affect historic properties. Cultural resources within the Wetlands Park would continue to be identified, updated, and managed following guidelines of the cultural resources management plan.

Proposed Action Alternative Direct Effects

Under the Proposed Action Alternative, the area of potential effect is an approximately 230-acre area on Reclamation-managed land within the Wetlands Park. Direct effects to historic properties may result from activities associated with the Undertaking such as: off-road transport and parking of equipment, drilling (primarily within the 100-foot by 100-foot or smaller-sized drilling pads), and monitoring well installation. Normal traffic along existing paved roads and bladed dirt roads near or within the recorded limits of a historic property is addressed in the PA and does not require avoidance or treatment plans.

¹⁰ Cultural Resources Management Plan for the Las Vegas Wash Archaeological District in Clark County Wetlands Park, Las Vegas, Nevada.

Direct effects to historic properties could result from alteration or partial or complete destruction of historic properties through mobilization of heavy equipment, compaction or excavation of soils within a site, or displacement of cultural materials through drilling.

To the extent possible, ground-disturbing activity associated with the Proposed Action will not occur within 75 feet or less of a historic property. If avoidance is not possible (ground-disturbing activity will occur within 75 feet or less of a historic property), an Archaeological Avoidance Plan and/or Monitoring Plan similar to the requirements in the PA will be prepared. Any fieldwork associated with the Proposed Action will be completed by a professionally qualified archaeologist that meets or exceeds criteria found in: *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (Title 36 CFR Part 61).

If, during the course of any activities associated with this Undertaking, any new sites, structures, or objects that are discovered, activities will cease in a 75-foot vicinity of the resource. Reclamation shall ensure that the stipulations of Title 36 CFR Part 800.11 are satisfied before activities in the vicinity of the previously unidentified property can be resumed.

Should construction activities result in the exposure of human remains, all activities shall cease within 75 feet of the discovery. The discovery will be immediately protected and secured, and Reclamation shall immediately be notified. Reclamation shall immediately notify the Clark County Coroner/Medical Examiner to investigate the discovery. Reclamation will comply with the Native American Graves Protection and Repatriation Act or Nevada Revised Statutes 383.150 and Nevada Revised Statutes 451.045 as appropriate.

Proposed Action Alternative Indirect Effects

The assessment for indirect effect considers how the Proposed Action could diminish the integrity of historic properties through the alteration of the setting, feeling, and/or association by means of visual, atmospheric, and audible elements associated with the Proposed Action.

Indirect effects are expected to occur from the geophysical survey, borehole drilling, installation of Phase I and II wells, and borehole/well plugging. Once the wells are installed, groundwater samples would be collected up to four times per year. Transducer data would be downloaded quarterly, and groundwater level measurements would be collected monthly for each well. Each monitoring well is anticipated to be used for 10 to 20 years. In addition, the numbers of workers, equipment, and vehicles necessary to execute the work would be minimal. Therefore, the Proposed Action is not expected to cause adverse indirect effects.

Cumulative Impacts

Reclamation does not anticipate that the Proposed Action will result in adverse cumulative impacts to historic properties. To the extent possible NDEP is planning to avoid historic properties. If an adverse effect to a historic property occurs on federal land, the adverse effect shall be resolved following the procedures of Title 36 CFR 800.5-*Resolution of Adverse Effect*.

The Downgradient Study on Clark County and City of Henderson land would not be a Reclamation Undertaking as defined in Title 36 CFR Part 800.16(y). Therefore, NDEP is working with the SHPO and the landowners to avoid historic properties in the Downgradient Study Area that are not located on federally managed land.

3.3.4 Recreation

3.3.4.1 Affected Environment

The Proposed Action is located within the 1,340-acre Downgradient Study Area and overlaps with portions of Reclamation properties, the City of Henderson, and the Clark County Wetlands Park. The Clark County Wetlands Park is a 2,900-acre multi-use recreational park which includes an approximately 13-mile Clark County Wetlands Park loop trail that overlaps with the Proposed Action (Clark County Parks & Recreation 2014). A nature center is located directly west of the NERT Site. Recreation uses at the park include pedestrian, biking, and equestrian activities.

3.3.4.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, installation of the groundwater monitoring wells or execution of the geophysical survey would not occur on Reclamation-managed lands. Approximately seven Phase I wells, seven Phase II wells, and 16 GI soil verification borings would be installed on Clark County and City of Henderson lands. A majority of these well and boring locations would overlap with the Clark County Wetlands Park loop trail. Clark County would be notified prior to drilling activities and would implement route detours in order to ensure the safety of the trail users. Trail closure would not be anticipated during the installation of the monitoring wells, GI, and drilling of soil borings and trail use would continue under current conditions. No recreational impacts would occur on Reclamation-managed lands.

Proposed Action Alternative

The proposed monitoring wells and boring locations on Reclamation-managed lands would be located directly adjacent or within close proximity to the Clark County Wetlands Park loop trail. However, no substantial long-term adverse impacts to recreation are anticipated.

Even though the maximum disturbance footprint for the drilling and installation of each well and soil verification boring would be approximately 100 feet by 100 feet for the full-size rotary sonic rig, the final well completion and soil verification boring footprints would be smaller. Well completions would be clearly marked and would be aboveground with approximately 3 feet of mild steel casing, a surface pad, and a lockable well cap above grade with four protective posts installed around each well. Traffic-rated, at-grade completions can also be installed if needed in specific areas along the trail. When monitoring wells are no longer needed, they would be plugged and grouted to the surface with cement. Additionally, the soil verification borings would create temporary surface and below-ground disturbances, after which the surface would be finished to match the existing surface. Although installation and plugging of the monitoring wells and GIs would temporarily affect recreational use of the Clark County Wetlands Park loop trail, the final well completion and soil verification borings would not permanently inhibit the recreational use of the Wetlands Park loop trail.

In addition, Clark County would be notified prior to drilling activities and would implement route detours in order to ensure the safety of the trail users. Trail closure would not be anticipated during the installation of the monitoring wells, GI, and drilling of soil borings.

Existing roads would be used to access drilling locations to limit disturbance of surface soil. Additionally, signs would be posted alerting recreational users of temporary roadway or bike path crossings that need to occur for well installation. Flagmen would be used to safely direct traffic for periodic delivery of large pieces of equipment.

With the implementation of best management practices to alert trail users and the installation of protected well structures, adverse effects to recreation are not anticipated to occur.

Cumulative Impacts

With the implementation of the entire Downgradient Study Area investigation, a total of approximately 23 wells (during Phase I and Phase II) would be installed and a total of 20 soil verification borings would occur as part of the GIs. Portions of the entire Downgradient Study Area investigation would be located directly adjacent to the Wetlands Park loop trail. Additionally, the Weir Dewatering Treatment Project would construct two weirs, two pump stations, and a centralized water treatment plant in the Las Vegas Wash to remove sediments and perchlorate from the groundwater extracted by SNWA. The Sunrise Mountain Weir and the Historic Lateral Weir Expansion would be located directly adjacent to the southern portion of the Wetlands Park loop trail. Similarly, Clark County would be notified prior to construction activities and route detours along the Wetlands Park loop trail and best management practices would be implemented to ensure the safety of the trail users. Trail closure would not be anticipated.

Minor cumulative impacts to recreational use of the Clark County Wetlands Park loop trail are anticipated from the Proposed Action, the entire Downgradient Study, and the Weir Dewatering. The majority of these impacts would be short term (2 to 3 years), while the main Downgradient Study and Weir Dewatering activities are occurring. Minor, intermittent impacts would occur after this period from well monitoring and well maintenance activities.

3.3.5 Visual Resources

3.3.5.1 Affected Environment

The Proposed Action on Reclamation-managed land is located within the Clark County Wetlands Park and surrounded by desert hills to the north, residents and commercial uses to the south, west, and east. The Clark County Wetlands Park loop trail is directly adjacent to and overlaps the Proposed Action. Trail users could potentially be exposed to the visual changes from the Proposed Action during and after installation of the monitoring wells and soil borings.

3.3.5.2 Environmental Consequences

No Action Alternative

Under the No Action Alternative, installation of the groundwater monitoring wells or execution of the GI would not occur on Reclamation-managed lands. Approximately seven Phase I and nine Phase II well installations, and 16 GI soil verification borings would be added to those already located in the Downgradient Study Area. No visual impacts would occur on Reclamation-managed lands.

Proposed Action Alternative

The Proposed Action activities would include the installation and development of three Phase I and six Phase II new wells to a depth of up to 120 feet. With regard to permanent visible changes, the above-ground portion of the wells will include 2 feet of mild steel casing and a lockable well cap and four protective posts (approximately 3 feet tall) installed around each well. Traffic-rated, at-grade well completions could also be installed if needed in specific areas. Once completed, the approximate ground area of each well would be 4 feet by 4 feet (inclusive of the concrete well pad and four bollards). Additionally, once a monitoring well is no longer needed, it would be plugged by removing the well casing and bollards, and grouting the well to the surface with neat cement. Due to the limited height of well installations, at-grade plugged wells, and the existence of similar well installations already located in the area, these structures are not anticipated to result in a substantial adverse visual effect.

In addition, four soil verification borings would occur as part of the GIs. These Proposed Action activities would consist of temporary surface and below-ground disturbances, after which the surface would be completed to match the existing surface. Crushing or trimming of vegetation, where necessary, would cause temporary visual impacts that would disappear once vegetation pops-up or grows back. Even though visual impacts would occur temporarily from the rotary sonic drill rig and two support vehicles during drilling activities, no visual effects would result after the geophysical surveys are completed. As such, no substantial adverse visual effect would result from the Proposed Action.

Cumulative Impacts

With the implementation of the entire Downgradient Study Area investigation, a total of approximately 23 wells (during Phase I and Phase II) would be installed to a depth of up to 120 feet. Additionally, a total of 20 soil verification borings would occur as part of the GIs.

As previously discussed, due to the limited height of well installations, at-grade plugged wells, and the existence of similar well installations and weirs already located within the area, the structures associated with the Proposed Action, the temporary impacts from crushing or trimming of vegetation, and the other project activities (i.e., entire Downgradient Study Area and Weir Dewatering Treatment Project) on non-Reclamation-managed lands would not result in a substantial cumulative adverse visual effect.

4.0 Coordination and Consultation

4.1 Agencies Consulted

NDEP is working in conjunction with EPA to investigate the surface water and groundwater impacts within the Downgradient Study Area. An NOI will be submitted to the DWR for review prior to drilling activities.

4.2 Endangered Species Consultation

Reclamation has determined that the Proposed Action may affect, but is not likely to adversely affect desert tortoise on Reclamation-managed lands. Reclamation will request concurrence with

this determination from the Service. The remainder of the Downgradient Study Area occurs on lands managed under the Clark County Multiple Species Conservation Plan Section 10 (a)(1)(B) permit TE034927-0.

4.3 Public Involvement

The Draft EA will be sent to SNWA, Clark County Parks and Recreation, the City of Henderson, and other agencies and interested parties for a 30-day review. The Draft EA will be posted on Reclamation's internet site at: <http://www.usbr.gov/lc/region/g2000/envdocs.html>. A news release regarding the availability of Draft EA will be sent to newspapers and other media.

5.0 References

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6.0 List of Preparers

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