Prepared for:
Nevada Environmental Response Trust
Las Vegas, NV

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Camarillo, CA
December 2016

Data Gap Investigation Plan – Transducer Installation and Monitoring

NERT Remedial Investigation – Downgradient Study Area
Nevada Environmental Response Trust Site
Henderson, Nevada

Final

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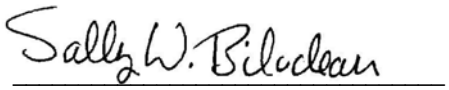
Data Gap Investigation Plan – Transducer Installation and Monitoring, Revision 0

Nevada Environmental Response Trust
Remedial Investigation – Downgradient Study Area, Henderson, Nevada

Responsible Certified Environmental Manager (CEM) for this project

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and, to the best of my knowledge, comply with all applicable federal, state and local statutes, regulations and ordinances.



12/27/2016

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List of Abbreviations

Downgradient Study Area	NERT RI Downgradient Study Area
EPA	U.S. Environmental Protection Agency
CTD	conductance, temperature and depth
DGIP	Data Gap Investigation Plan
HASP	Health and Safety Plan
IDW	investigation-derived waste
LVW	Las Vegas Wash
NDEP	Nevada Division of Environmental Protection
NERT	Nevada Environmental Response Trust
NERT Site	former Kerr McGee/Tronox site
QAPP	Quality Assurance Project Plan
RI	Remedial Investigation
SNWA	Southern Nevada Water Authority
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
µg/L	micrograms per liter

1.0 Introduction

This Data Gap Investigation Plan (DGIP) describes the location, procedures and methods for the installation of transducers in existing wells along the Las Vegas Wash (LVW) in support of the Downgradient Study Area of the Nevada Environmental Response Trust (NERT) Remedial Investigation (RI) in Henderson, Nevada (herein referred to as the Downgradient Study Area or Project) (**Figure 1**). This DGIP was developed at the direction of the Nevada Division of Environmental Protection (NDEP) and describes the procedures and methods for establishing transducer locations, installing transducers, and collecting data from transducers. The activities in this DGIP will be conducted in conformance with the AECOM Quality Assurance Project Plan (QAPP) (AECOM 2016b) and the site-specific AECOM Health and Safety Plan (HASP) (AECOM 2016a). Data collected under this DGIP – Transducer Installation and Monitoring will be reported in a technical memorandum that will in turn be further evaluated by NERT during the preparation of the RI Report.

The overall objective of the investigation of the Downgradient Study Area is to identify subsurface pathways downgradient and cross-gradient of the NERT RI Study Area through which perchlorate-impacted groundwater is entering the LVW. The objective of installing transducers is to provide data on water level changes in existing wells near the LVW to address data gaps identified in the historic and recent (April 2016) groundwater monitoring data. While quarterly groundwater level data have been collected from a limited number of groundwater wells over the past few years, groundwater data have not been collected over a continuous period of time, nor has it been collected from a comprehensive assemblage of wells along the LVW.

The proposed transducer locations were established based on the results of the April-May 2016 groundwater sampling event, during which 61 groundwater samples were collected from wells throughout the Downgradient Study Area. The groundwater well sampling locations are shown on **Figure 2**.

As part of the work plan preparation, NERT was contacted to determine what their transducer program included. In addition the Seep Well Field Flow Quantification Technical Memorandum by Ramboll dated September 9, 2016, (Ramboll 2016) was reviewed. In the vicinity of the Seep Well Field, NERT has installed transducers in ten wells (PC-62, PC-68, PC-108, PC-155A, PC-155B, PC-156A, PC-156B, PC-157A, PC-157B, and WMW6.15S) northeast of the Bird Viewing Ponds. Monitoring well WMW6.15S is located adjacent to the LVW near the Pabco Road Weir. Each well has been equipped with a data logger (In-Situ Aqua TROLL 200) and a cellular network telemetry system (In-Situ Tube 300R). The data logger measures temperature, conductivity, absolute water pressure, and water level. In addition, the data logger calculates and reports specific conductivity, salinity, total dissolved solids, resistivity, and water density. The tube measures absolute barometric pressure and automatically applies a barometric pressure correction to the water level that is reported in the telemetrically transmitted data. Measurements are taken at 15-minute intervals and tubes typically transmit recent logger and tube data telemetrically to the Ramboll Environ FTP site every 12 hours. The data loggers continue to collect and store data when they fail to transmit, and, therefore, data can be manually downloaded if needed. Based on the results of the initial data evaluation as summarized in the September 9, 2016, Technical Memorandum (Ramboll 2016), it was recommended to install transducers in the following wells: PC-96, PC-97, PC-155A, PC-155B, PC-156A, PC-156B, PC-157A, PC-157B. One well in each of the following well pairs was also recommended to have transducers installed: PC-86 or PC-87; PC-88 or PC-90; and PC-91 or PC-92.

2.0 Background

The former Kerr McGee/Tronox site (NERT Site) (**Figure 1**) has been the location of industrial operations since 1942 when it was developed by the United States government 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 On-Site Study Area, as well as those conducted at adjacent properties, resulted in contamination of environmental media, including 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 and 2011 from the NERT Site to minimize potential health risks from impacted soil. Additional soil removal was performed in 2013 when the eastern end of the Beta Ditch was excavated. The soil removal activities and post-removal conditions are described in detail in the Revised Interim Soil Removal Action Completion Report (ENVIRON International Corporation 2012). On-site groundwater removal actions included the installation of the groundwater extraction and treatment system, which was designed to capture and treat perchlorate and hexavalent chromium in shallow groundwater.

In the spring of 1999, SNWA hydrologists discovered a seep discharging to the LVW at approximately 400 gallons per minute. Perchlorate concentrations in the seep exceeded 100,000 micrograms per liter (µg/L) (**Figure 1**). The results of the seep sample indicated that a significant mass flux of perchlorate was entering the LVW; Kerr McGee subsequently implemented a capture system in November 1999 to reduce the migration of perchlorate to the LVW (ENSR International 2005).

Ongoing investigations have been focused on the NERT Site and NERT RI Off-Site Study Area (**Figure 1**). Little information on groundwater has been collected in the Downgradient Study Area located west, north and east of the NERT RI Off-Site Study Area (**Figure 1**). Groundwater elevation data are needed that represent the current groundwater levels and that show possible fluctuations over time. Data recorded by the proposed transducers will help refine the understanding of groundwater levels near the LVW. Of specific interest is where and when the water levels indicate that LVW is gaining and or losing water as well as how the groundwater levels respond to surface water fluctuations in LVW. Water levels in LVW are available from U.S. Geological Survey (USGS) gaging stations and readings are typically recorded every 15 minutes. These data are posted on the waterdata.usgs.gov site. AECOM is also planning to install transducers in LVW to measure surface water levels under a different project and if the installations are complete and data are available, this water level information would be used as well.

3.0 Investigation Objectives and Locations

The objectives for the installation of transducers are discussed in the following subsections. In addition, the rationale for each transducer location is described in these subsections.

3.1 Transducer Installation Objectives

3.1.1 Transducer Installation

Groundwater level data in the Downgradient Study Area, specifically along the LVW, has not been monitored on a regular basis or over a continuous period of time. Limited groundwater level data is available from wells along the LVW owned by the Southern Nevada Water Authority (SNWA). Additional water level data (if any) collected by SNWA during the time frame of our data collection will be requested and reviewed. In November 2015, NERT installed ten conductance, temperature, and depth (CTD) loggers in the vicinity of the seep well field. The data from the CTD loggers was used to evaluate daily water level changes, as well as to look for longer term changes. The surface water level in LVW shows a daily fluctuation of approximately 0.3 feet. Groundwater levels obtained in wells adjacent to LVW show a similar pattern of fluctuation but with a smaller amplitude. The further a well was from the LVW the less the groundwater responded to surface water level changes (Ramboll 2016).

Groundwater levels in the LVW are assumed to fluctuate seasonally. Groundwater in the area around the City of Henderson Bird Viewing ponds follows an annual cycle of higher water levels in summer and lower water levels in winter (Ramboll 2016). Groundwater elevation data over an extended period of time are needed to understand fluctuations on groundwater levels near the LVW.

To obtain this information, Solinst transducers will be installed in a maximum of 20 groundwater monitoring wells. Data will be recorded every 15 minutes and will thus provide 96 groundwater level readings per instrument per day. These data, in conjunction with data collected as part of the Downgradient Study Area investigations as well as the NERT RI, will be used to:

- better understand the groundwater levels;
- identify daily and seasonal variation along the LVW;
- evaluate where and when the LVW influences local groundwater levels; and
- identify statistical groundwater elevation trends using Mann-Kendall trend analysis and/or additional statistical tests as considered appropriate based on EPA guidance (EPA 2009).
- It will also be used to refine the site conceptual model.

3.1.2 Rationale for Transducer Locations

The well locations for the proposed installation of transducers were selected to provide groundwater level data on the north and south sides of LVW to determine the relationship and response of groundwater levels to the different stages of the water levels in the wash. In addition, wells present in areas where seeps or springs were observed were selected to determine the relationship, if any, of the potentiometric surface to the surface water features. The wells that were selected for transducer installation are listed on **Table 1**, which includes the measured well depth, screened interval, if known, water-bearing zone and lithology. Only shallow water-bearing zone wells were selected because the deeper water-bearing zones would not be expected to be influenced significantly by surface water level changes. The table also presents the rationale for selecting the well to have a transducer installed.

Since there are very little data on the north side of LVW, all six wells present on the north side were selected to have transducers installed. Five of these wells are located on the same river mile transects as five wells (referred

to as “well pairs” in **Table 1**) on the south side of LVW. These five well pairs were selected to have transducers installed to provide five cross sections of the groundwater levels across LVW. The five well pairs are: WMW3.5N and WMW3.5S; LNDMW1 and LNDMW 2; WMW4.9N and WMW4.9S; WMW6.15N and WMW6.15S[1]; and WMW6.9N and WMW6.9S. Although WMW5.7N does not have a companion well on the south side of the wash it was selected for installation of a transducer to provide water level data in this location on the north side of LVW.

Several wells present along the C-1 drainage channel and a tributary wash near the Upper Narrows Weir were selected to have transducers installed to see what effect, if any, these surface water features may have on groundwater levels. These wells are AA-30, WMW5.5S, PC-74, and PC-77.

Two wells (MW-13 and MW-20) on the northern boundary of the Henderson Landfill Site were selected for the installation of transducers to evaluate water levels on the northern side of the Henderson Landfill upgradient from the LVW.

Two wells (WMW6.55S and COH2B1) near the Seep Well Field were included because they exhibited high perchlorate concentrations (1,800 µg/L and 5,600 µg/L, respectively) during the April-May 2016 groundwater sampling event. The transducer data will provide water level information for this area that may aid in understanding the effect of well field pumping.

Well WMW5.58S1 is located within a meander of LVW and exhibits lower perchlorate concentrations than nearby wells. The transducer data may aid in understanding if surface water is mixing with groundwater at this location. Additional details regarding the rationale for transducer installation locations are provided in **Table 1**.

[1] Well WMW6.15S already has a NERT transducer installed in it so a new transducer will not be installed in this well. The water level data from the existing transducer will be obtained from NERT.

4.0 Installation and Data Collection Procedures

Transducer installation procedures are discussed in the following subsections. In addition, the pre-field activities and data collection procedures are described in these subsections.

4.1 Field Procedures

All activities must comply with the HASP (AECOM 2016a). Field personnel need to take care to ensure skin does not contact groundwater. Appropriate personal protective equipment, as described in the HASP, shall be used.

4.1.1 Pre-field Activities

AECOM will obtain site access to wells and properties for the installation of transducers. Access to Clark County and U.S. Bureau of Reclamation (USBR) properties has been permitted under the USBR Use Authorization Permit (Form 7-2540). AECOM will provide notification to landowners prior to mobilization.

Transducers will be programmed prior to deploying them into the field for installation. Each transducer will be labeled with the well identification in which it will be installed. The recording interval, date, time, and well identification will be preprogrammed into each transducer using the manufacturer's software.

4.1.2 Transducer Installation

Transducers will be installed in 19 existing groundwater wells located along the LVW, extending from the Duck Creek Confluence Weir to the Three Kids Weir, spanning the length of the Downgradient Study Area. The proposed locations of the transducers are shown on **Figure 2**. The transducer automatically records and stores the groundwater level data. The data can be accessed by direct download from the transducer at the surface. A barometer will be placed in well WMW4.43S to provide barometric pressure readings.

Prior to the installation of the transducer and again following installation of the transducer, a manual groundwater level measurement will be collected using a water-level sounder. Static groundwater level readings will be measured and recorded to the nearest 0.01 foot from the surveyed reference mark on the top edge of the inner well casing. If no reference mark is present, the measurement should be taken from the north side of the inner casing and the location noted in the field notes. Manual water levels will be recorded in each well monthly while the transducers are in use. This will provide comparison data in case the transducer instrument starts to drift. Manual water levels will be collected when the data are downloaded as well.

The installation of each dedicated transducer typically consists of placing the transducer at approximately 20 feet below the top of the water table and securing the transducer with a cable within the well head. As shown on **Table 1,** some wells have less than 20 feet of water column so for these wells the transducer will be placed approximately 2 feet above the bottom of the well. For each well, the depth below the groundwater level and elevation of the transducer will be recorded in the field notes. The transducer cable will be secured in the well with the well cap.

Each transducer will be programmed to record pressure at a frequency of every 15 minutes (96 times per day). Automated readings from the transducers will need to be corrected for barometric pressure fluctuations. A barometer reader will be installed in one of the 19 wells and programmed to record barometric pressures at the same frequency as the transducer measurements.

4.1.3 Documentation Procedures

Records generated during field work include field logs, photographic logs, equipment inspection/calibration records, and transducer data. The QAPP (AECOM 2016b) describes the necessary documentation activities that must be implemented to properly document work performed. The QAPP for the proposed Downgradient Study Area is a separate document adapted from the existing QAPP for the NERT RI and is consistent with U.S. Environmental Protection Agency (EPA) guidance.

4.1.4 Investigation-Derived Waste Management

Investigation-derived waste (IDW) associated with the installation of transducers will consist of used personal protective equipment (disposable nitrile gloves) and household trash such as used paper towels, etc. No liquids will be generated during the installation of transducers because no groundwater samples will be collected. A minimal amount of liquid IDW will be generated when the transducers are removed from the well and decontaminated. The liquid IDW will be temporarily placed into a polyethylene tank; at the end of each day, the liquid IDW will be taken to the Groundwater Extraction and Treatment System at the NERT Site and discharged into the GW-11 pond, which receives groundwater pumped from extraction wells at the Seep Area and Athens Road Well Fields. The remaining IDW generated will be double-bagged in plastic trash bags.

4.2 Transducer Data Collection

As mentioned in Section 4.1.2, the transducers will record changes in pressure (groundwater levels) every 15 minutes (96 times per day). Similarly, a barometer installed in one of the wells will record barometric pressures at the same frequency as the transducer measurements. After the first 3-month period the frequency of monitoring will be evaluated and adjusted to be less frequent if warranted. Data will be downloaded from the transducers on a quarterly basis for two quarters following installation. During data collection, the transducers will be brought up to the surface for data download directly from the transducer. Data from the transducers will be downloaded using the manufacturer's handheld data reader and software. After downloading of data, care will be taken that recording of data has been restarted and to make sure the transducer comes to rest at its prescribed depth.

Each time the transducer is brought to the surface, the cable and transducer will be inspected for signs of damage. If damage to the cable is noted, the cable will be replaced with a new one of the same length. If damage is noted to the transducer, the transducer will be taken out of the well and sent in for repairs or replaced, as needed.

4.3 Transducer Removal

When the transducers are no longer required, they will be removed from the well. Transducers will be pulled up by hand and decontaminated for storage or appropriate reuse, recycling, or disposal. Decontamination will consist of a wash with Alconox™ detergent (or equivalent) in potable water, followed by a first rinse in potable water and a second rinse in distilled water. The transducers will be allowed to air dry prior to being stored. Cables used to suspend the transducers will be decontaminated and then disposed of.

5.0 Schedule and Reporting

It is anticipated that the activities described in this DGIP will begin in November 2016 after the DGIP has been approved, as applicable, by NDEP, EPA, and NERT. Transducer installation will take approximately five days to complete. Downloading of data from the 19 transducers will take two days to complete each quarter.

Hydrographs will be prepared to show groundwater levels during the monitoring period. Draft hydrographs will be provided to NDEP after each data download. Statistical analysis will be conducted using the data downloaded from the transducers. The Mann-Kendall trend test (EPA ProUCL 5.0 statistical software package) is proposed to analyze relative magnitude of groundwater trends (EPA 2016). It should be noted that the test is specific to the trend in the well in which the data was collected and is not appropriate for a regional evaluation of water level trends. Additional statistical tests, as considered appropriate based on EPA guidance (EPA 2009), may also be used.

Figures showing manual groundwater level measurements collected during the installation and two data downloads will be used to depict the potentiometric surface along the LVW within the Downgradient Study Area. Summary tables of the manual groundwater level data will be prepared. These data will be compared to the USGS and/or AECOM gaging data for water levels within LVW. This evaluation would include a comparison of elevation data to see if the surface water elevation is higher or lower than the groundwater elevation, comparison of the daily change in elevation of the surface water to see if a similar change is observed in groundwater, and to evaluate changes in groundwater elevation that may not be the results of surface water elevation changes.

A technical memorandum will be prepared that will summarize the transducer installation and groundwater level evaluation. The technical memorandum will include a brief description of field installation activities and will present summary tables of groundwater levels, statistical analysis, and figures depicting groundwater levels. The technical memorandum will also include copies of the field data sheets.

A preliminary draft of the technical memorandum will be issued within approximately three weeks of the last data download, for review by NDEP, NERT, and EPA. Approximately two weeks following receipt of review comments, which will be consolidated by NDEP into one comment table, a draft technical memorandum will be prepared. The draft technical memorandum will be provided to the stakeholders for review. Approximately two weeks following receipt of comments from stakeholders, the technical memorandum will be finalized and distributed to NDEP, NERT, EPA, and other stakeholders.

A summary of the DGIP task is provided below.

Task	Approximate Schedule
Transducer Installation Activities	1 week following field mobilization
First Quarterly Data Download	3 months following transducer installation activities
Preliminary Draft Data provided to NDEP	3 weeks following download
Second Quarterly Data Download	3 months following first quarterly data download
Preliminary Draft Technical Memorandum	3 weeks from second data download
Draft Technical Memorandum	2 weeks following receipt of comments
Final Technical Memorandum	2 weeks following receipt of comments

6.0 References

AECOM, 2016a. Health and Safety Plan, NERT Remedial Investigation – Downgradient Study Area, Nevada Environmental Response Trust, Henderson Nevada. February.

AECOM, 2016b. Quality Assurance Project Plan, NERT Remedial Investigation – Downgradient Study Area, Nevada Environmental Response Trust, Henderson Nevada. March.

ENSR International, 2005. Conceptual Site Model Kerr-McGee Facility, Henderson, Nevada. February.

ENVIRON International Corporation, 2012. Revised Interim Soil Removal Action Completion Report, Nevada Environmental Response Trust Site, Henderson, Nevada. August 2010 – November 2011. January. Revised September 28. NDEP approved December 17, 2012.

Environmental Protection Agency (EPA), 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007.

EPA, 2016. ProUCL Software, Statistical Software ProUCL 5.1.00 for Environmental Applications for Data Sets with and without Nondetect Observations. Accessed at: https://www.epa.gov/land-research/proucl-software. Accessed on: September 26, 2016.

Ramboll, 2016. Technical Memorandum Seep Well Field Quantification, Nevada Environmental Response Trust Site, Henderson Nevada. September 9, 2016.

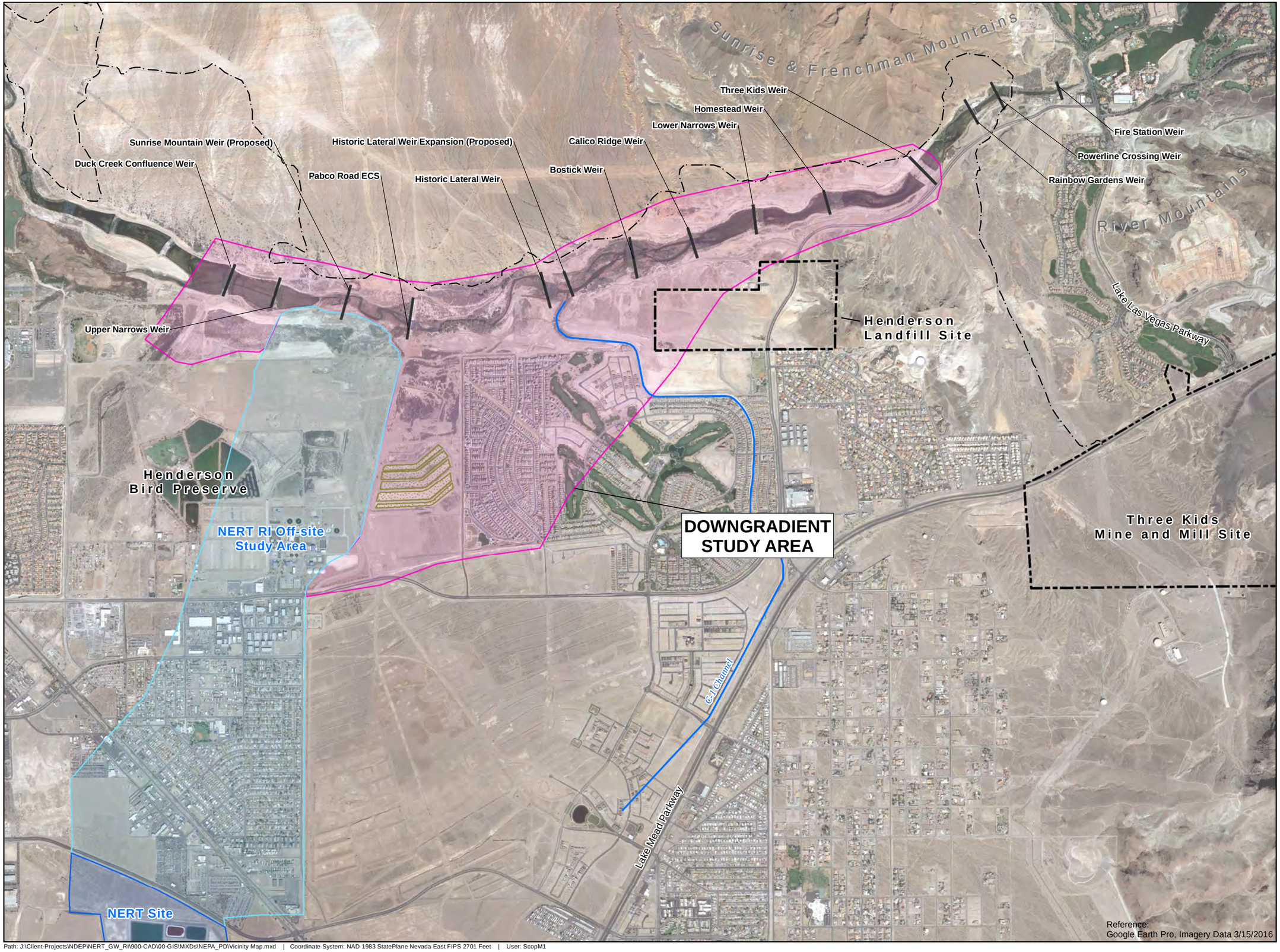
Table

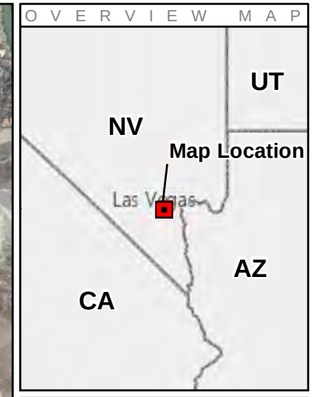
Table 1
Wells Selected for Installation of Transducers
NERT RI - Downgradient Study Area
Henderson Nevada

Well ID	Depth to Groundwater (feet) (1)	Measured Well Depth (feet) (1)	Water Column (feet)	Screen Interval (feet, bgs) (2)	Water-Bearing Zone (3)	Lithology (4)	Rationale for Selection
AA-30	20.44	34.05	13.61	11.7 - 31.7	Shallow	Qal	To evaluate water level changes west of C-1 drainage channel and between the Chimera Golf Course and well WMW 5.5S.
COH2B1	16.98	67	50.02	Unknown	Shallow	Qal	To evaluate water level changes near the Seep Well Field.
LNDMW1	36.99	61.56	24.57	Unknown	Shallow	Qal	To evaluate water level changes on north and south side of LVW between Lower Narrows and Homestead weirs.
LNDMW2	34.39	55.05	20.66	Unknown	Shallow	Qal	
MW-13	35.58	49.4	13.82	38-48	Shallow	Qal	To evaluate water level changes at the northwest corner of Henderson Landfill and between Henderson Landfill and LVW.
MW-20	33.05	67.25	34.20	50-65	Shallow	Thumb Formation?	To evaluate water level changes between LVW and Henderson Landfill and within the Thumb formation.
PC-74	11.59	48.25	36.66	39.5 - 49.5	Shallow	Qal	To evaluate water level changes along a tributary wash between PC-75 and LVW.
PC-77	7.19	38.87	31.68	29.5 - 39.5	Shallow	Qal	To evaluate water level changes along a tributary wash and uogradient of PC-74.
WMW3.5N	35.64	56.6	20.96	Unknown	Shallow	Qal	To evaluate water level changes on north and south side of LVW and where a seep was observed.
WMW3.5S	43.60	59.80	16.20	--	Shallow	Qal	
WMW4.9N	31.91	53.00	21.09	Unknown	Shallow	Qal	To evaluate water level changes on north and south side of LVW between Bostick and Calico Ridge weirs.
WMW4.9S	26.58	46.75	20.17	Unknown	Shallow	Qal	
WMW5.58S1	10.48	40.95	30.47	Unknown	Shallow	Qal	To evaluate water level changes in a well located within a meander of the LVW that exhibits lower perchlorate concentrations (510 µg/L) than nearby wells potentially due to mixing of lower concentration surface water with groundwater.
WMW5.5S	15.51	38.3	22.79	Unknown	Shallow	Qal	To evaluate water level chages in a well that exhibits high perchlorate concentrations (3,200 µg/L) and that is along the C-1 Drainage Channel. In addition this well is between AA-30 and LVW.
WMW5.7N	9.47	21	11.53	Unknown	Shallow	Qal	To evaluate water level changes on the north side of LVW.
WMW6.15N	23.3	38.4	15.10	Unknown	Shallow	Qal	To evaluate water level data from a well located on the north side of LVW paired with WMW6.15S. WMW6.15S already has a NERT transducer installed.
WMW6.15S	19.41	10.28	9.13	Unknown	Shallow	Qal	
WMW6.55S	16.03	40.67	24.64	Unknown	Shallow	Qal	To evaluate water level changes in a well with high perchlorate concentrations (1,800 µg/L) on the south side of LVW near the Seep Well Field.
WMW6.9N	18.42	48.55	30.13	--	Shallow	Qal	To evaluate water level changes on the north and south sides of LVW near Duck Creek Confluence weir.
WMW6.9S	11.43	51.55	40.12	--	Shallow	Qal	

Notes:
bgs = below ground surface
LVW=Las Vegas Wash
Qal = Alluvium
µg/L = micrograms per liter
(1) Depth to groundwater and total well depth were measured in April 2016 by AECOM.
(2) Screened interval was obtained from the NERT All Wells Database.
(3) Water bearing zone was obtained from the NERT All Wells Database and from the definition that the shallow water bearing zone is present from 0 to 90 feet below ground surface.
(4) Lithology was obtained from the NERT All Wells Database, from geotechnical investigations conducted for the weirs, and from the 1980 Bell and Smith Geologic map of the Henderson Quadrangle.

Figures





Legend

- Wetlands Trail
- Channels
- Northern Rapid Infiltration Basins
- NERT Downgradient Study Area
- NERT Off-site Study Area
- NERT Site

NORTH

0 2,000

Feet

Scale 1:24,000

1 inch = 2,000 feet

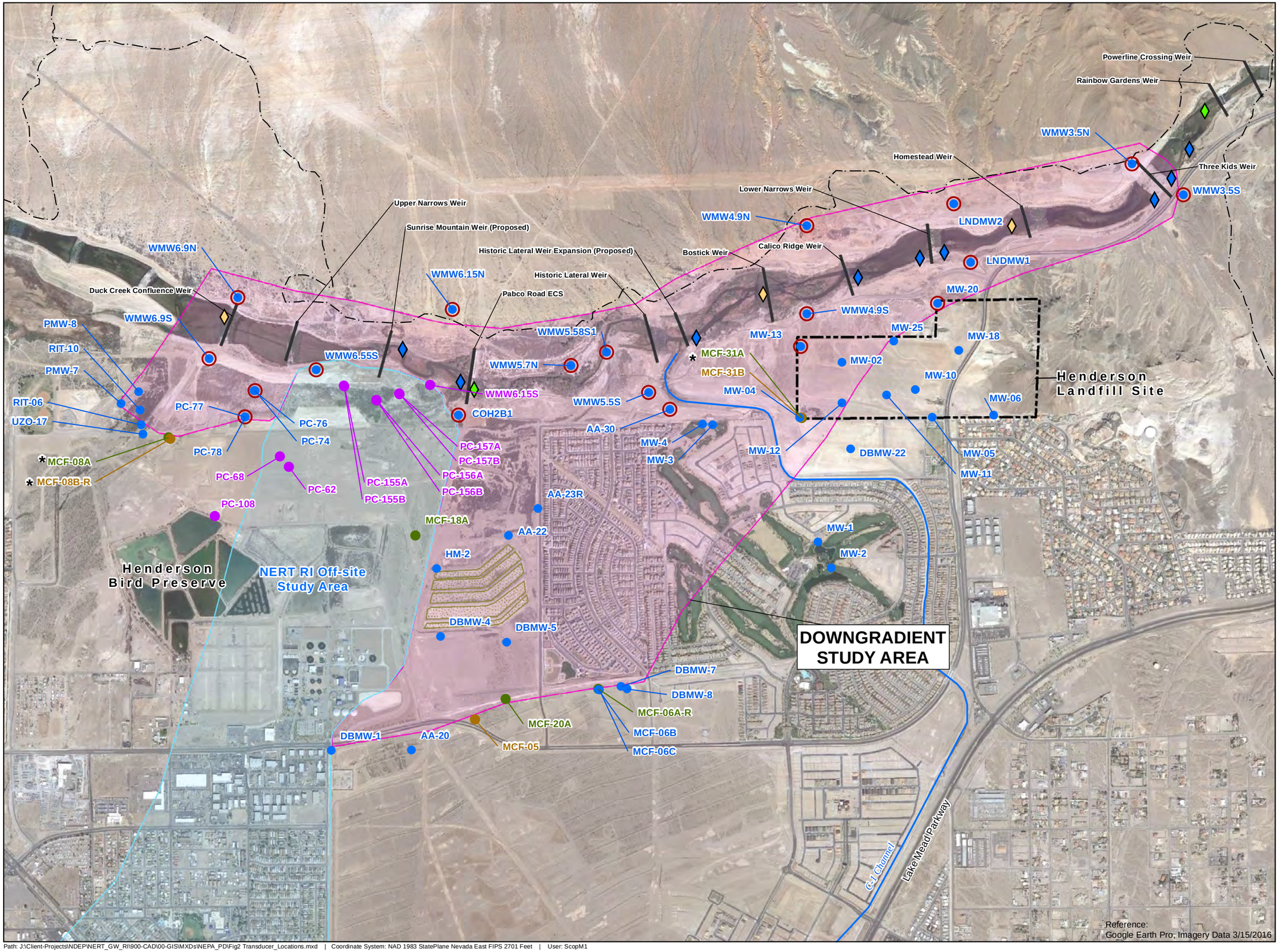
NERT
Downgradient Study Area

DOWNGRADIENT STUDY AREA LOCATION MAP

Date: 12/12/2016 Project: 60477365

AECOM

Figure 1



OVERVIEW MAP

Legend

- Proposed Location of Transducer Installation
- Groundwater Monitoring Well in Shallow Water Bearing Zone
- Groundwater Monitoring Well in Middle Water Bearing Zone
- Groundwater Monitoring Well in Deep Water Bearing Zone
- NERT Transducer Well
- Artesian Well
- Approximate Location of Temporary USGS Stream Gage
- Approximate Location of Permanent USGS Stream
- Approximate Location of Staff Gage Installation
- Wetlands Trail
- C-1 Channel
- Northern Rapid Infiltration Basins
- NERT RI Downgradient Study Area
- NERT RI Off-site Study Area

0 1,500
Feet
Scale 1:18,000
1 inch = 1,500 feet

NERT
Downgradient Study Area

PROPOSED TRANSDUCER INSTALLATION LOCATIONS

Date: 12/12/2016 Project: 60477365

AECOM **Figure 2**

Reference:
Google Earth Pro: Imagery Data 3/15/2016

Path: J:\Client-Projects\NDEP\NERT_GW_RI\900-CAD\00-GIS\MXDs\NEPA_PD\Fig2 Transducer_Locations.mxd | Coordinate System: NAD 1983 StatePlane Nevada East FIPS 2701 Feet | User: ScopM1