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ENVIRONMENT
& HEALTH

December 7, 2017

TECHNICAL MEMORANDUM

To: Steve Clough
Nevada Environmental Response Trust

From: Scott Warner, Ramboll Environ
John Pekala, CEM#2347, Expires 9/20/2018, Ramboll Environ

Re: RI Phase 3 Modification No. 1
Results of Well Inspections, Additional Proposed Wells, and All Wells Database Update for the Eastside Sub-Area
Nevada Environmental Response Trust Site
Henderson, Nevada

This Technical Memorandum presents Ramboll Environ's recommended Modification No. 1 to the scope of work presented in the *RI/FS Work Plan Addendum: Phase 3 Remedial Investigation, Revision 1* dated October 27, 2017 and approved by NDEP on November 8, 2017 ("Phase 3 RI Work Plan").

Please find herein a summary of findings from the well inspection program conducted in the Eastside Sub-Area within the Eastside Study Area[1] in preparation for the Phase 3 Remedial Investigation (RI) for the Nevada Environmental Response Trust (NERT or Trust) Site (the "Site") in Henderson, Nevada. The inspection program, performed between July 31 and August 17, 2017, was intended to evaluate and document the readily observable condition, accessibility, and repair needs of existing monitoring wells within the Eastside Sub-Area prior to planned groundwater sampling activities as part of the Phase 3 RI. A tabular summary of this information is included in Table 1 and also described in this technical memorandum. The results of the well inspections are depicted on Figures 1 and 2.

Based on the results of the existing well inspections in the Eastside Sub-Area, Ramboll Environ recommends adding six well locations to the scope of the Phase 3 RI Work Plan. With the addition of these six wells, the total number of new proposed monitoring wells for the Phase 3 RI is 38 wells (27 wells in the Eastside Sub-Area and 11 wells in the Northeast Sub-Area). As further described below, these six additional proposed locations were selected to replace wells found to be damaged or missing during the well inspections at locations important to understanding the distribution of perchlorate and chlorate in

[1] Well inspections have not yet been conducted in the Northeast Sub-Area within the Eastside Study Area due to property access constraints. The Trust will continue to work with property owners to access this area, so that Ramboll Environ can inspect the 14 existing wells in the Northeast Sub-Area, as well as two wells in the Downgradient Study Area near the northern Eastside Study Area boundary.

groundwater within the Eastside Sub-Area. The proposed well locations included in this Modification No. 1 are shown on Figures 3 and 4.

1. COMPREHENSIVE MONITORING WELL INSPECTION IN THE EASTSIDE SUB-AREA

The intent of this task was to conduct well inspections at known monitoring well locations (based on the NDEP-maintained well database and discussions with Basic Remediation Company [BRC] personnel) within the Eastside Sub-Area (108 wells total). This work was conducted between July 31 and August 17, 2017. Well inspections consisted of both qualitative visual observations (e.g., well completion/construction, apparent damage, missing components) and physical measurements (e.g., casing diameter, depth to water, total well depth, and casing stick up). Data and observations collected as part of the field inspections were recorded digitally in the field using tablet computers and a well record application developed from ERSI Inc.'s Collector Application program. The collected data and observations were then used to assess maintenance and repair needs of the wells and verify the accuracy of information (including location and well construction information) in the All Wells Database. Photos depicting the wells appearance, location, and condition were also taken at each well location.

Ramboll Environ contacted BRC, the property and well owner for a majority of the inspected well locations, regarding the findings of the well inspections. BRC provided additional information regarding access, installation, and abandonment of specific wells, which has been incorporated into this document's findings.

Missing, Damaged, and Other Inaccessible Wells

The following observations relate to missing, damaged, and inaccessible wells noted during the well inspections:

- Wells were not found at 28 of the 108 inspected locations despite searching within an approximate 100-foot radius of each well's anticipated position using a global positioning system (gps) device. We contacted BRC regarding the 28 wells that could not be located.[2] In response, BRC indicated that five of the apparently missing wells were abandoned, reinstalled, and then likely paved over during development of the Cadence master-planned community. These five wells could be sampled if (after being located) they are brought up to current grade and properly completed. Subsequent to the well inspections, BRC shared well abandonment records (without re-installation) for three additional inspected locations. The abandonment history of the other 20 wells that could not be located is unknown; BRC was not aware that wells at these locations were missing or abandoned prior to the inspections.
- Various constraints (e.g., non-standard locks, rusted and cross-threaded lids, and excessive well stick-up) currently limit access to the well interior at eight additional locations. Some issues may be addressed through minor repairs (e.g., cutting locks), while other issues are more involved and repairs would involve coordination with the well owner.

[2] Contact with BRC regarding well status consisted of email correspondence with Josh Carroll of BRC between mid-September and mid-October 2017.

- Damage noted during the inspections generally consisted of missing well caps, broken PVC casing, or erosion around the well. Two wells were found to be filled with soil and therefore cannot be sampled.

A list of observed damage and/or access constraints is included in Table 1. As discussed in the next section, several new wells are being proposed as part of this Modification No. 1 in order to provide data in areas where there are missing, heavily damaged, or otherwise inaccessible wells.

Other Field Observations and Measurements

Various identifying measurements and observations, including type of surface completion, total well depth, and depth to water, were collected at each well location as part of the inspections.

Dry wells (defined as wells that had less than approximately 1.5 feet of water at the time of sounding the water level within the well) were encountered at 15 locations. These wells will be re-sounded and evaluated for sampling as part of the Phase 3 RI sampling event. Additionally, as discussed in the next section, several new (deeper) wells are being proposed as part of this Modification No. 1 to provide data in areas where there are multiple adjacent dry wells.

Measurements of total well depth are included within Table 1 and were compared against expected construction information from the All Wells Database. The measured depth of most wells was reasonably consistent with the expected construction information with one exception: a well measured at the mapped location of BEC-6 (in a cluster with MCF-32 series wells) was found to be 363.5 feet deep, substantially greater than the expected total depth of approximately 80 feet (based on both the All Wells Database and the 2001 Exploration Log and Well Construction Log for BEC-6). A well consistent with the reported construction of BEC-6 was not identified in the All Wells Database at this location.

Ramboll Environ also observed that 26 of the wells were equipped with apparent dedicated pumps, although the functionality of the pumps was not evaluated during the inspections.

Well Inspection Summary of Findings

The following is a summary of the well inspections performed in July and August 2017:

- ***Wells Found to be in Good Condition: 54 wells***
  - Wells found to be in good condition with sufficient water to sample are shown on Figures 1 and 2 and are listed in Table 1 with no color highlights.
- ***Not Located or Destroyed: 30 wells***
  - Details: 5 wells may exist under pavement, 3 wells have been abandoned, 20 wells could not be located, and 2 wells were destroyed and filled with soil.
  - Figures 1 & 2: Locations are outlined in purple (may exist under pavement) or outlined in red (not located or destroyed)
  - Table 1: Locations are highlighted in purple (may exist under pavement) or red (not located or destroyed)

- ***Not Accessible: 8 wells***
  - Figures 1 & 2: Locations are outlined in yellow and the accessibility issue is described for each location
  - Table 1: Locations are highlighted in yellow
- ***Dry: 15 wells***
  - Figures 1 & 2: Locations are outlined in light blue
  - Table 1: Locations are highlighted in light blue
- ***Other: 1 well (BEC-6)***
  - Figure 1: Location is highlighted in orange
  - Table 1: Location is highlighted in orange

2. RECOMMENDED PHASE 3 RI WORK PLAN MODIFICATIONS - EASTSIDE SUB-AREA

The results of the well inspections were reviewed with the Trust in conjunction with the sampling scope outlined in the Phase 3 RI Work Plan.

Based on this review, Ramboll Environ recommends adding six (6) wells screened within the Shallow Water Bearing Zone (WBZ) to the scope of the Phase 3 RI Work Plan. Given the lack of recent monitoring data for many wells within the Eastside Study Area, Ramboll Environ anticipated that some well locations identified in the Phase 3 RI Work Plan would likely be damaged or missing. The locations of the proposed new wells are intended to replace missing, dry, or extensively damaged wells considered important to characterizing the distribution of chemicals of potential concern (COPCs) in the Eastside Sub-Area. The addition of these six new wells, combined with the other proposed wells/soil borings and existing accessible well network, will sufficiently characterize COPCs within the Eastside Sub-Area for the purposes of the Phase 3 RI Work Plan. The six proposed additional well locations are shown on Figures 3 and 4.

Unanticipated changes in the distribution of accessible monitoring wells due to ongoing construction and grading activities within the Eastside Sub-Area may result in additional data gaps beyond those currently identified. Data completeness will be reviewed following the initial Phase 3 RI sampling event. In the event additional data gaps are identified, Ramboll Environ will confer with the Trust, and, if necessary, an additional RI Modification may be prepared.

The table below describes the location and purpose of each recommended well:

Proposed Well	Reason for Modification
ES-8A	Serves as a replacement for well BEC-6, which was found to have a substantially different screened interval than reported by the well owner. This location is critical to understanding the extent of higher perchlorate concentrations historically mapped near the center of the Eastside Sub-Area. Proposed well will be screened in the Upper Muddy Creek Formation (UMCf) within the Shallow WBZ.

Proposed Well	Reason for Modification
ES-28	Replaces well HMWWT8 (which could not be located) and provides concentration data in the shallow WBZ within the south-central portion of the Eastside Sub-Area. Proposed well will be screened in the UMCf within the Shallow WBZ.
ES-29	Replaces well HMW-21 (which could not be located) and provides concentration data in the shallow WBZ within the south-central portion of the Eastside Sub-Area. Proposed well will be screened in the UMCf within the Shallow WBZ.
ES-30	Provides data immediately north of an area of historically high perchlorate concentration and serves as a replacement for a number of missing, dry or inaccessible wells. Proposed well will be screened in the UMCf within the Shallow WBZ.
ES-31	Provides data for understanding the distribution of perchlorate in proximity to a mapped paleochannel within the northwest portion of the Eastside Sub-Area and serves as a replacement for a number of dry or inaccessible wells. Proposed well will be screened in the UMCf within the Shallow WBZ.
ES-32	Provides data for understanding the distribution of perchlorate immediately east of a historically high perchlorate concentration area and serves as a replacement for a number of missing, dry, or inaccessible wells. When available, the results from adjacent planned soil boring ESB-2 will be reviewed to confirm the need for a permanent well at this location before well ES-32 is installed. If installed, this proposed well will be screened in the UMCf within the Shallow WBZ.

Soil Sampling and Well Construction

Assuming the addition of the six well locations outlined above, 38 new monitoring wells are proposed for installation within the Eastside Study Area as part of the Phase 3 RI Work Plan. Anticipated well construction details and soil sampling for each location are shown in Table 6-5 (updated from version presented in the Phase 3 RI Work Plan, Revision 1). The specified screened intervals may be adjusted during well installation based on depth to groundwater, the local thickness of the units, or in order to span sandy lenses within or close to the target well depth. The specified screen lengths were selected to provide representative groundwater samples at the selected depth. This table has also been updated to correct minor errors in the target WBZ's identified for some of the other wells planned to be installed as part of the Phase 3 RI Work Plan.

Groundwater Sampling and Hydraulic Characterization

Following installation and development and consistent with the Phase 3 RI Work Plan, Revision 1, the new wells will be sampled and analyzed for COPCs (i.e., perchlorate and chlorate) and general chemistry parameters during two rounds of sampling, as outlined in Table 6-2 (updated from version presented in the Phase 3 RI Work Plan, Revision 1). Field parameters will also be measured during sampling consistent with the Phase 3 RI Work Plan, Revision 1. Hydraulic characterization of each new well will also be consistent with the methods outlined in the Phase 3 RI Work Plan, Revision 1.

3. ALL WELLS DATABASE UPDATE

As requested by the NDEP in their comment letter dated August 29, 2017 on the Phase 3 RI Work Plan (Revision 0), we have included electronically an updated version of the All Wells Database. The updated version includes changes to status (i.e., active, plugged and abandoned) and casing diameter, but no adjustments have been made to total well depth, stick-up, or location coordinates (northing and easting) based on the inspection results.

Please contact us should you have any questions about the information presented in this technical memorandum.

Attachments

Table 1	Eastside Sub-Area Well Inspection Summary
Table 6-2 (Revised)	Groundwater Monitoring Well Sampling Plan
Table 6-5 (Revised)	Soil Sampling and Well Construction at New Groundwater Monitoring Wells

Figure 1	Shallow Well Inspection Results, Eastside Sub-Area
Figure 2	Middle WBZ (90-270 ft bgs) and Deep WBZ (>270 ft bgs) Well Inspection Results, Eastside Sub-Area
Figure 3	Shallow Well Inspection Results and New Proposed Well Locations, Eastside Sub-Area
Figure 4	Planned Boring Locations/Planned and Existing Monitoring Well Locations

All Wells Database Update (included electronically)

TABLES

Table 1. EASTSIDE SUB-AREA WELL INSPECTION SUMMARY
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site, Henderson, Nevada

Eastside Sub-Area Wells

Well ID	Owner	Well Location Information							Access Constraints*				Other Critical Issues	Other Field Observations and Measurements					
					Additional Notes														
		Northing	Easting	Well Found?	Well Re-installed by BRC	Well Abandoned by BRC	Recently Graded Area	Location in Roadway	Non-BRC Lock	15/16" Bolts	3/4" Bolts	Other Access Contraints		Apparent Dedicated Pump	Depth to Water (ft bgs)	Total Depth (ft bgs)	Surface Completion	Casing (inches)	Casing Material
AA-UW3	BRC	26718183.9	835097.9	No			X												
AA-UW6	BRC	26725552.5	839469.2	No	X														
BEC-1	BRC	26721120.0	830926.0	No															
DBMW-2	BRC	26728059.4	830530.3	No				X											
DM-2	BRC	26722367.7	833704.1	No															
DM-3	BRC	26724052.0	832896.6	No			X												
DM-8	BRC	26727795.2	838790.6	No		X													
DM-9	BRC	26725421.1	836017.9	No			X												
HMW-17	NA	26722107.5	833609.4	No				X											
HMW19	COH	26721300.3	832870.2	No				X											
HMW-21	COH	26721504.2	835446.9	No		X													
HMW22	COH	26718085.3	835244.9	No			X												
HMWWT4	COH	26721385.6	832430.0	No			X												
HMWWT8	COH	26720421.6	833239.4	No			X												
MCF-02A	BRC	26718435.2	833801.4	No	X														
MCF-02B	BRC	26718432.2	833785.7	No	X														
MCF-04	BRC	26723668.6	837630.2	No				X											
MCF-12A	BRC	26727429.3	840058.8	No	X														
MCF-12B	BRC	26727441.8	840046.0	No	X														
MCF-12C	BRC	26727428.9	840042.1	No		X													
MCF-21A	BRC	26727963.0	838100.0	No				X											
MCF-22A	BRC	26729054.0	840735.0	No				X											
MCF-23A	BRC	26726049.0	830726.5	No															
MCF-25A	BRC	26722042.8	830660.6	No			X												
PG220	NA	26724769.9	834703.2	No															
PG221	NA	26725890.0	833749.7	No															
POD2-R2	BRC	26724833.6	831879.0	No															
POD3-R	BRC	26724439.5	833450.6	No															
LG025	NA	26720915.0	830873.8	Uncertain								The steel cap on apparent well cross-threaded and rusted shut.							
PG211	NA	26725840.8	831877.1	Uncertain								The steel cap on apparent well cross-threaded and rusted shut.					Stovepipe		
LG014	NA	26725106.3	835541.3	Uncertain								Two adjacent potential wells identified. The steel caps on both apparent wells are cross-threaded and rusted shut.					Stovepipe		
BEC-6	BRC	26724104.6	835794.9	Uncertain									Well measured in expected location of BEC-6 (in cluster with MCF-32 series wells), but is 363.5 ft deep. The expected total depth of BEC-6 is approximately 80 ft.	X	14.69	363.5	Stovepipe	4	PVC
AA-01	BRC	26720238.7	830921.0	Yes											48.17	51.41	Stovepipe	4	PVC
AA-09	BRC	26723441.4	831041.6	Yes										X	39.43	68.62	Stovepipe	4	PVC
AA-11	BRC	26725458.9	830672.6	Yes										X	Dry	31.45	Stovepipe	4	PVC
AA-13	BRC	26722861.0	833889.4	Yes										X	59.9	62.82	Stovepipe	4	PVC

Table 1. EASTSIDE SUB-AREA WELL INSPECTION SUMMARY
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site, Henderson, Nevada

Eastside Sub-Area Wells

Well ID	Owner	Well Location Information							Access Constraints*				Other Critical Issues	Other Field Observations and Measurements				
					Additional Notes													
		Northing	Easting	Well Found?	Well Re-installed by BRC	Well Abandoned by BRC	Recently Graded Area	Location in Roadway	Non-BRC Lock	15/16" Bolts	3/4" Bolts	Other Access Contraints		Apparent Dedicated Pump	Depth to Water (ft bgs)	Total Depth (ft bgs)	Surface Completion	Casing (inches)	Casing Material
AA-14	BRC	26724283.5	833615.7	Yes								Well located on top of 4 foot mound.		X	64.82 (Dry)	65.29	Stovepipe	4	PVC
AA-15	BRC	26726004.2	831753.7	Yes										X	Dry	42.67	Stovepipe	4	PVC
AA-18	BRC	26727656.4	836690.9	Yes										X	58.84	69.51	Stovepipe	4	PVC
AA-19	BRC	26727447.1	832521.4	Yes										X	Dry	44.71	Stovepipe	4	PVC
AA-20	BRC	26728007.8	831811.8	Yes											31.01	33.08	Stovepipe	4	PVC
AA-27	BRC	26719301.7	832471.3	Yes										X	67.59	84.2	Stovepipe	4	PVC
AA-UW1	BRC	26719625.0	831427.2	Yes											51.4	69.31	Stovepipe	4	PVC
AA-UW2	BRC	26718117.1	832819.5	Yes											66.2	78.65	Stovepipe	4	PVC
AA-UW4	BRC	26720029.4	836517.0	No													Traffic Box		
AA-UW5	BRC	26722958.5	838134.7	Yes	X					X					45.25	57.41	Traffic Box	4	PVC
BEC-4	BRC	26723946.7	830699.3	Yes									Significant damage to PVC casing. No cap covering flushmount well.		Dry	28.85	Other	4	PVC
BEC-5	BRC	26725181.0	834179.0	Yes											59.36	68.49	Stovepipe	4	PVC
BEC-7	BRC	26725933.0	832697.0	Yes							X				56.64	60.46	Other	4	PVC
BEC-9	BRC	26727221.5	833049.5	Yes							X	Does not appear accessible by vehicle.			51.02	58.83	Traffic Box	4	PVC
BEC-10	BRC	26727623.5	835778.6	Yes									No cap covering flushmount well.		57.3	89.11	Traffic Box	4	PVC
BEC-12	BRC	26728991.0	840870.0	Yes							X				50.17	60.08	Traffic Box	4	PVC
DBMW-1	BRC	26727999.1	830469.8	Yes											36.96	51.48	Stovepipe	4	PVC
DBMW-3	BRC	26728150.2	831032.8	Yes						X					27.48	36.55	Traffic Box	4	PVC
DBMW-5	BRC	26729807.3	833399.1	Yes											27.74	37.98	Stovepipe	4	PVC
DBMW-6	BRC	26728947.3	834409.7	Yes											52.11 (Dry)	52.8	Stovepipe	4	PVC
DBMW-7	BRC	26729070.0	835304.9	Yes											58.11	73.35	Stovepipe	4	PVC
DBMW-8	BRC	26729026.9	835406.7	Yes											57.12	69.2	Stovepipe	4	PVC
DBMW-9	BRC	26727788.8	836248.4	Yes											59.84	76.77	Stovepipe	4	PVC
DBMW-10	BRC	26727918.6	836955.6	Yes											61.52	76.8	Stovepipe	4	PVC
DBMW-11	BRC	26727990.8	837595.6	Yes									Extensive erosion of soil around and under concrete base.		37.09	63.9	Stovepipe	4	PVC
DBMW-12	BRC	26727975.8	838001.0	Yes											47.72	78.98	Stovepipe	4	PVC
DBMW-13	BRC	26727960.5	838577.0	Yes	X							No space to park on side of road adjacent to well.			46.08	57.75	Stovepipe	4	PVC
DBMW-14	BRC	26727957.6	838987.3	Yes	X							No space to park on side of road. Despite having correct key, well lock could not be removed due to angle of well cap.			NA		Stovepipe		
DBMW-15	BRC	26727964.3	839477.5	Yes	X							No space to park on side of road adjacent to well.			28.64	51.62	Stovepipe	4	PVC
DBMW-16	BRC	26728557.0	840514.8	Yes											90.47	113.85	Stovepipe	4	PVC
DBMW-17	BRC	26728097.3	840772.3	Yes											57.05	75.44	Stovepipe	4	PVC
DBMW-18	BRC	26727750.5	840571.3	Yes											55.73	68.54	Stovepipe	4	PVC
DM-1	BRC	26722024.7	832745.0	Yes											50.56	54.05	Stovepipe	2	PVC
DM-5	BRC	26728698.9	833187.3	Yes											Dry	23.45	Stovepipe	2	PVC
DM-7B	BRC	26727896.5	837165.7	Yes					X						NA		Stovepipe		
HMW-18	NA	26721690.0	832673.6	Yes											51.59 (Dry)	53.18	Other	2	PVC
HMW-20	NA	26721321.7	834158.7	Yes											64.49 (Dry)	64.53	Stovepipe	2	PVC
HMWWT1	COH	26724079.8	836377.3	Yes						X					50.49	65.21	Traffic Box	2	PVC

Table 1. EASTSIDE SUB-AREA WELL INSPECTION SUMMARY
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site, Henderson, Nevada

Eastside Sub-Area Wells

Well ID	Owner	Well Location Information							Access Constraints*				Other Critical Issues	Other Field Observations and Measurements					
		Northing	Easting	Well Found?	Additional Notes: Well Re-installed by BRC	Additional Notes: Well Abandoned by BRC	Additional Notes: Recently Graded Area	Additional Notes: Location in Roadway	Non-BRC Lock	15/16" Bolts	3/4" Bolts	Other Access Contraints		Apparent Dedicated Pump	Depth to Water (ft bgs)	Total Depth (ft bgs)	Surface Completion	Casing (inches)	Casing Material
HMWWT6	COH	26722112.8	837455.8	Yes							X	Bolts appear to fully unscrew but cannot be removed making lid impossible to lift and remove. Could not access well interior.			NA		Traffic Box		
MCF-01A	BRC	26720244.9	830905.3	Yes										X	34.66	351.98	Stovepipe	4	PVC
MCF-01B	BRC	26720256.8	830888.6	Yes										X	47.48	86.08	Stovepipe	4	PVC
MCF-03A	BRC	26721058.8	836835.3	Yes										X	29.41	385.53	Stovepipe	4	PVC
MCF-03B	BRC	26721066.6	836813.2	Yes										X	44.54	80.32	Stovepipe	4	PVC
MCF-05	BRC	26728512.9	832871.1	Yes										X	51.27	233.1	Stovepipe	4	PVC
MCF-06A-R	BRC	26729028.1	834929.4	Yes										X	102.52	376.79	Stovepipe	4	PVC
MCF-06B	BRC	26729012.6	834930.9	Yes										X	57.45	85.2	Stovepipe	4	PVC
MCF-06C	BRC	26729004.8	834945.7	Yes										X	57.12	62.35	Stovepipe	4	PVC
MCF-09A	BRC	26723427.1	831024.3	Yes										X	41.46	286.77	Stovepipe	4	PVC
MCF-09B	BRC	26723449.6	831019.2	Yes										X	39.45	129.88	Stovepipe	4	PVC
MCF-11	BRC	26725461.5	830656.2	Yes										X	31.53	105.68	Stovepipe	4	PVC
MCF-16A	BRC	26726023.3	835886.9	Yes										X	40.77	385.81	Stovepipe	4	PVC
MCF-16B	BRC	26726026.5	835867.6	Yes										X	61.95	310.81	Stovepipe	4	PVC
MCF-16C	BRC	26726030.2	835846.4	Yes										X	63.35	79.3	Stovepipe	4	PVC
MCF-20A	BRC	26728860.1	833381.2	Yes										X	72.83	383.85	Stovepipe	4	PVC
MCF-24A	BRC	26725570.9	833661.1	Yes										X	72.17	378.2	Stovepipe	4	PVC
MCF-24B	BRC	26725619.3	833839.4	Yes											65.8	174.85	Stovepipe	4	PVC
MCF-27	BRC	26719293.1	832488.1	Yes										X	0.51	384.52	Stovepipe	4	PVC
MCF-32A	BRC	26724066.6	835743.7	Yes											15.91	358.54	Stovepipe	4	PVC
MCF-32B	BRC	26724074.9	835753.1	Yes											55	152.82	Stovepipe	4	PVC
POD2	BRC	26724896.9	831847.4	Yes											Dry	48.3	Stovepipe	4	PVC
POD2-R	BRC	26724825.4	831955.5	Yes											63.82 (Dry)	64.4	Stovepipe	4	PVC
POD4	BRC	26724840.0	833983.5	Yes								Well stick up 7.1' above ground surface.			NA		Stovepipe	4	PVC
POD4-R	BRC	26725123.8	834026.9	Yes											53.74 (Dry)	54	Stovepipe	4	PVC
POD5-R	BRC	26723030.3	831382.9	Yes					X						NA		Stovepipe		
POD6	BRC	26723512.9	831969.0	Yes									Well filled with soil.		NA		Other	4	PVC
POD6-R	BRC	26723201.0	832061.5	Yes								Well closed with 1/2" bolts.	Well filled with soil.		NA		Other		
POD7	BRC	26724196.9	832881.2	Yes					X						NA		Stovepipe		
POD7-R	BRC	26723526.0	832450.7	Yes									Significant damage to PVC casing. No cap covering flushmount well.		47.40 (Dry)	48.78	Other	4	PVC
POD8	BRC	26724789.8	833586.1	Yes											69.25	76.37	Stovepipe	4	PVC
POU1	BRC	26722139.8	832851.3	Yes									No cap covering flushmount well. Well total depth is approx. 15 feet above expected location, possible as a result of sediment fill.		Dry	43.81	Stovepipe	6	Steel
POU2	BRC	26723328.8	834652.1	Yes											Dry	28.22	Stovepipe	4	PVC
POU3	BRC	26721664.7	831330.0	Yes											40.03	67.15	Stovepipe	4	PVC

Table 1. EASTSIDE SUB-AREA WELL INSPECTION SUMMARY
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site, Henderson, Nevada

Well ID	Owner	Well Location Information							Access Constraints*				Other Critical Issues	Other Field Observations and Measurements					
		Northing	Easting	Well Found?	Additional Notes: Well Re-installed by BRC	Additional Notes: Well Abandoned by BRC	Additional Notes: Recently Graded Area	Additional Notes: Location in Roadway	Non-BRC Lock	15/16" Bolts	3/4" Bolts	Other Access Contraints		Apparent Dedicated Pump	Depth to Water (ft bgs)	Total Depth (ft bgs)	Surface Completion	Casing (inches)	Casing Material
Eastside Sub-Area Wells																			
Northeast Sub-Area Wells																			
AA-07	BRC	26729559.5	837100.4																
AA-26	BRC	26733349.1	840176.5																
DBMW-4**	BRC	26729903.3	832296.0																
DBMW-22	BRC	26733030.3	839141.0																
LG231	NULL	26728199.4	837411.6																
LG232	NULL	26728203.2	837354.5																
MCF-07	BRC	26729569.8	837113.6																
MW-04**	COH	26733552.6	838288.6																
MW-05	COH	26733563.6	840501.6																
MW-07	COH	26735162.9	841228.1																
MW-1	CGC	26731476.2	838593.4																
MW-10	COH	26734020.3	840223.4																
MW-11	COH	26733930.7	839738.7																
MW-18	COH	26734674.1	840946.1																
MW-2	CGC	26731044.4	838816.8																
WW-6	NULL	26728801.5	836483.7																

Notes:
* A majority of wells in the Eastside Sub-Area are locked with a standard lock opened via the same key.
** Well located in Downgradient Study Area near Eastside Study Area boundary.
ft bgs = feet below ground surface

	Inspected well location was missing, destroyed, or otherwise inaccessible and cannot be repaired.
	Well was not located, but may be accessible if well location is brought up to current grade.
	Access constraints that will require a physical modification to address.
	Well location was dry at time of inspection.
	Well location has not been inspected.
	Other issue found at inspected well location; see notes.

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Revision Date:
12/2017

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
EASTSIDE SUB-AREA										
Planned New Wells										
ES-1	NERT	NA	NA	95	110	15	TBD	--	X	X
ES-2	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-3	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-4	NERT	NA	NA	70	90	20	TBD	--	X	X
ES-5	NERT	NA	NA	70	85	15	TBD	--	X	X
ES-6	NERT	NA	NA	55	75	20	TBD	--	X	X
ES-7	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-8A	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-8B[2]	NERT	NA	NA	90	110	20	TBD	--	X	X
ES-9	NERT	NA	NA	80	100	20	TBD	--	X	X
ES-10	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-11	NERT	NA	NA	35	55	20	TBD	--	X	X
ES-12	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-13	NERT	NA	NA	90	105	15	TBD	--	X	X
ES-14A	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-14B	NERT	NA	NA	100	115	15	TBD	--	X	X
ES-15	NERT	NA	NA	70	90	20	TBD	--	X	X
ES-16	NERT	NA	NA	80	100	20	TBD	--	X	X
ES-17	NERT	NA	NA	80	100	20	TBD	--	X	X
ES-18	NERT	NA	NA	80	100	20	TBD	--	X	X
ES-19	NERT	NA	NA	90	110	20	TBD	--	X	X
ES-20	NERT	NA	NA	90	110	20	TBD	--	X	X
ES-28	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-29	NERT	NA	NA	50	70	20	TBD	--	X	X

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
ES-30	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-31	NERT	NA	NA	45	65	20	TBD	--	X	X
ES-32[3]	NERT	NA	NA	40	60	20	TBD	--	X	X
Shallow Water-Bearing Zone Wells (<90 ft bgs)										
AA-01	BRC	1755.02	49	29	49	20	Qal	X	--	X
AA-09	BRC	1694.26	70	30	65	35	Qal	X	--	X
AA-11	BRC	1658.18	28	9	29	20	Qal	DRY	--	DRY?
AA-14	BRC	1698.07	58	38	58	20	Qal	X	--	X
AA-18	BRC	1665.60	62	45	65	20	Qal	X	--	X
BEC-4	BRC	NA	39	25	40	15	Qal	X	--	X
DBMW-2	BRC	1625.01	45	20	50	30	Qal	X	--	X
DM-1	BRC	1729.11	55	30	55	25	Qal	X	--	X
DM-5	BRC	1623.51	23	7	22	15	Qal	DRY	--	DRY?
DM-8	BRC	1682.22	38	19	39	20	Qal	X	--	X
LG025	NA	1738.60	24	19	23	4	Qal	X	--	X
PG211	NA	1659.66	35	15	35	20	Qal	X	--	X
PG220	NA	1699.60	66	26	66	40	Qal	X	--	X
POD2	BRC	1673.80	49	41	46	5	Qal	X	--	X
POD4	BRC	1692.39	54	47	52	5	Qal	X	--	X
POD4-R	BRC	1692.69	55	47	52	5	Qal	X	--	X
POD5-R	BRC	1692.57	33	11	31	20	Qal	X	--	X
POD6-R	BRC	1698.10	54	21	46	25	Qal	X	--	X
POD7	BRC	1692.78	52	48	53	5	Qal	X	--	X
POD8	BRC	1691.16	74	43	73	30	Qal	X	--	X
POU1	BRC	1728.75	58	48	58	10	Qal	X	--	X
POU2	BRC	1724.88	39	33	38	5	Qal	X	--	X

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
POU3	BRC	1728.00	55	35	65	30	Qal	X	--	X
AA-13	BRC	1722.37	51	38	58	20	Qal/UMCf	X	--	X
AA-15	BRC	1655.46	36	20	40	20	Qal/UMCf	X	--	X
AA-19	BRC	1639.84	39	22	42	20	Qal/UMCf	X	--	X
AA-20	BRC	1625.98	27	10	30	20	Qal/UMCf	X	--	X
AA-27	BRC	1787.03	67	62	82	20	QalUMCf	X	--	X
AA-UW2	BRC	1817.63	61	55	75	20	Qal/UMCf	X	--	X
AA-UW3	BRC	1809.07	65	60	80	20	Qal/UMCf	X	--	X
AA-UW5	BRC	1765.05	45	37	57	20	Qal/UMCf	X	--	X
BEC-1	BRC	1731.91	30	25	40	15	Qal/UMCf	X	--	X
BEC-5	BRC	1689.66	58	54	69	15	Qal/UMCf	X	--	X
BEC-7	BRC	1662.82	48	45	60	15	Qal/UMCf	X	--	X
DBMW-1	BRC	1624.13	40	19	49	30	Qal/UMCf	X	--	X
DBMW-3	BRC	1623.40	31	19	39	20	Qal/UMCf	X	--	X
DBMW-4**	BRC	1605.81	25	10	30	20	Qal/UMCf	X	--	X
DBMW-6	BRC	1629.55	39	30	50	20	Qal/UMCf	X	--	X
DM-7B	BRC	1660.24	41	25	45	20	Qal/UMCf	X	--	X
DBMW-10	BRC	1660.83	60	55	75	20	Qal/UMCf	X	--	X
DBMW-14	BRC	1681.89	36	35	65	30	Qal/UCMf	X	--	X
DBMW-17	BRC	1709.57	64	52	72	20	Qal/UMCf	X	--	X
DBMW-18	BRC	1714.11	47	45	65	20	Qal/UMCf	X	--	X
DM-2	BRC	1728.80	50	30	65	35	Qal/UMCf	X	--	X
DM-3	BRC	1694.71	55	29	64	35	Qal/UMCf	X	--	X
DM-9	BRC	1702.68	56	40	60	20	Qal/UMCf	X	--	X
MCF-16C	BRC	1689.88	70	53	73	20	Qal/UMCf	X	--	X
POD2-R	BRC	1673.80	51	45	60	15	Qal/UMCf	X	--	X

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
POD2-R2	BRC	1675.00	47	45	60	15	Qal/UMCf	X	--	X
POD3-R	BRC	1688.88	NA	NA	NA	NA	NA	X	--	X
AA-UW1	BRC	1771.22	55	55	65	10	UMCf	X	--	X
AA-UW4	BRC	1796.79	32	35	55	20	UMCf	X	--	X
AA-UW6	BRC	1737.01	33	37	57	20	UMCf	X	--	X
BEC-6	BRC	1725.26	55	65	80	15	UMCf	X	--	X
BEC-9	BRC	1647.74	37	44	59	15	UMCf	X	--	X
BEC-10	BRC	1657.38	30	73	88	15	UMCf	X	--	X
BEC-12	BRC	1683.50	41	45	60	15	UMCf	X	--	X
DBMW-5	BRC	1606.65	12	15	35	20	UMCf	X	--	X
DBMW-7	BRC	1628.99	41	50	70	20	UMCf	X	--	X
DBMW-8	BRC	1628.99	41	48	68	20	UMCf	X	--	X
DBMW-9	BRC	1656.76	40	54	74	20	UMCf	X	--	X
DBMW-11	BRC	1664.20	30	50	70	20	UMCf	X	--	X
DBMW-12	BRC	1666.36	30	45	75	30	UMCf	X	--	X
DBMW-13	BRC	1675.93	30	45	75	30	UMCf	X	--	X
DBMW-15	BRC	1690.25	36	40	65	25	UMCf	X	--	X
DBMW-16	BRC	1691.08	95 [a]	85	110	25	UMCf	X	--	X
HMW-17	COH	1729.50	NA	NA	NA	NA	NA	X	--	X
HMW-18	COH	1732.50	NA	NA	NA	NA	NA	X	--	X
HMW-19	COH	1742.50	NA	NA	NA	NA	NA	X	--	X
HMW-20	COH	1751.50	NA	NA	NA	NA	NA	X	--	X
HMW-21	COH	1760.00	NA	NA	NA	NA	NA	X	--	X
HMWWT1	COH	1729.66	40	51	66	15	UMCf	X	--	X
HMWWT4	COH	1741.00	30	36	51	15	UMCf	X	--	X
HMWWT6	COH	1774.31	30	36	51	15	UMCf	X	--	X

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
HMWWT8	COH	1766.00	50	56	71	15	UMCf	X	--	X
MCF-01B	BRC	1753.95	49	55	85	30	UMCf	X	--	X
MCF-03B	BRC	1783.46	40	57	77	20	UMCf	X	--	X
MCF-06B	BRC	1630.27	43	67	82	15	UMCf	X	--	X
MCF-06C	BRC	1630.28	43	44	59	15	UMCf	X	--	X
MCF-12B	BRC	1712.74	52	64	84	20	UMCf	X	--	X
POD6	BRC	1697.70	48	61	66	5	UMCf	X	--	X
POD7-R	BRC	1698.60	47	NA	NA	NA	NA	X	--	X
Middle Water-Bearing Zone Wells (90-270 ft bgs)										
MCF-02B	BRC	1816.36	77	215	235	20	UMCf	X	--	--
MCF-05	BRC	1625.00	25	221	231	10	UMCf	X	--	--
MCF-09B	BRC	1693.00	70	105	125	20	UMCf	X	--	--
MCF-11	BRC	1657.75	32	94	104	10	UMCf	X	--	--
MCF-12C	BRC	1713.03	52	155	175	20	UMCf	X	--	X
MCF-24B	BRC	1680.00	49	150	170	20	UMCf	X	--	X
MCF-32B	BRC	1728.31	56	140	160	20	UMCf	X	--	X
Deep Water-Bearing Zone Wells (>270 ft bgs)										
MCF-01A	BRC	1754.44	53	335	355	20	UMCf	X	--	--
MCF-02A	BRC	1816.44	78	360	380	20	UMCf	X	--	--
MCF-03A	BRC	1783.23	38	364	384	20	UMCf	X	--	--
MCF-04	BRC	1748.35	38	379	399	20	UMCf	X	--	--
MCF-06A-R	BRC	1630.00	43	333	373	40	UMCf	X	--	--
MCF-09A	BRC	1694.26	70	270	290	20	UMCf	X	--	--
MCF-12A	BRC	1713.68	52	350	370	20	UMCf	X	--	--
MCF-16A	BRC	1689.67	70	365	385	20	UMCf	X	--	--

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
MCF-16B	BRC	1689.75	47	284	314	30	UMCf	X	--	--
MCF-20A	BRC	1622.99	17	360	380	20	UMCf	X	--	--
MCF-21A	BRC	1663.63	25	345	365	20	UMCf	X	--	--
MCF-23A	BRC	1643.86	42	362	382	20	UMCf	X	--	--
MCF-24A	BRC	1674.07	43	355	375	20	UMCf	X	--	--
MCF-25A	BRC	1708.72	38	325	365	40	UMCf	X	--	--
MCF-27	BRC	1787.03	142 [a]	362	382	20	UMCf	X	--	--
MCF-32A	BRC	1727.88	56	350	370	20	UMCf	X	--	--
NORTHEAST SUB-AREA										
Planned New Wells										
ES-21A	NERT	NA	NA	30	50	20	TBD	--	X	X
ES-21B	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-22A	NERT	NA	NA	30	50	20	TBD	--	X	X
ES-22B	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-23A	NERT	NA	NA	30	50	20	TBD	--	X	X
ES-23B	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-24	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-25A	NERT	NA	NA	30	50	20	TBD	--	X	X
ES-25B	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-26	NERT	NA	NA	60	80	20	TBD	--	X	X
ES-27	NERT	NA	NA	60	80	20	TBD	--	X	X
Existing Monitoring Wells										
AA-07	BRC	1610.12	52	30	50	20	Qal	X	--	X
AA-26	BRC	1563.56	110 [a]	32	52	20	Qal	X	--	X
DBMW-22	BRC	1532.08	15	35	55	20	UMCf	X	--	X

Revision Date:
12/2017

Table 6-2 (Revised). GROUNDWATER MONITORING WELL SAMPLING PLAN
RI Phase 3 Work Plan, Modification No. 1
Nevada Environmental Response Trust (NERT) Site; Henderson, Nevada

Well ID	Well Owner	Ground Surface (ft msl)	Depth to Qal/ UMCf Contact (ft bgs)	Depth to Top of Screen (ft bgs)	Depth to Bottom of Screen (ft bgs)	Screen Length (feet)	Screened Lithology	Baseline Sampling Event	New Well Initial Sampling	Eastside Study Area Sampling
LG231	NA	1660.00	30	89	99	10	UMCf	X	--	X
LG232	NA	1660.00	30	290	300	10	UMCf	X	--	X
MCF-07	BRC	1610.07	45	350	370	20	UMCf	X	--	X
MCF-22A	BRC	1680.62	65	342	382	20	UMCf	X	--	X
MW-04**	COH	1527.85	25	20	30	10	Qal/UMCf	X	--	X
MW-05	COH	1567.75	35	NA	NA	NA	NA	X	--	X
MW-10	COH	1543.40	NA	NA	NA	NA	NA	X	--	X
MW-11	COH	1539.53	NA	NA	NA	NA	NA	X	--	X
MW-18	COH	1581.77	NA	NA	NA	NA	NA	X	--	X
MW-1	CGC	1563.81	NA	NA	NA	NA	NA	X	--	X
MW-2	CGC	1580.35	NA	NA	NA	NA	NA	X	--	X

Notes:

[1] See Table 6-3 for analytical testing program. Field parameters including temperature, pH, dissolved oxygen (DO), oxygen reduction potential (ORP), electrical conductivity (EC), and turbidity will be measured during sampling.

[2] ES-8 has been renamed ES-8B due to the installation of paired well ES-8A as part of Modification No. 1. The construction details for ES-8B are identical to ES-8.

[3] The installation of well ES-32 is considered preliminary. The need for a permanent monitoring well at this location will be evaluated based on the results for adjacent soil boring ESB-2.

** Well located in Downgradient Study Area near Eastside Study Area boundary.

Highlighted wells are part of BRC's current groundwater monitoring program.

Well included in Phase 3 RI Work Plan, Modification No. 1 scope.

BRC = Basic Remediation Company

COH = City of Henderson

CGC = Chimera Golf Course

Qal = Alluvium

UMCf = Upper Muddy Creek Formation

[a] appears anomalous

NA = Not Available

ft msl = feet, mean sea level datum

ft bgs = feet below ground surface

TABLE 6-5 (Revised). SOIL SAMPLING AND WELL CONSTRUCTION AT NEW GROUNDWATER MONITORING WELLS
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Revision Date: 12/2017

Pilot Boring Number	Rationale for Sampling	Planned Soil Samples [1]			Soil Analytical Testing Program [2]				Construction Details for New Wells [1,3]						
		Boring Depth (ft bgs)	Planned Soil Sample Depths (ft bgs)	No. of Samples	Perchlorate	Chlorate	Total Chromium	Moisture Content	Monitoring Well ID	Casing Diameter and Type	Screen Size (inches)	Screened Interval (ft bgs)	Sand Pack Interval (ft bgs)	Target WBZ	Sand Pack Size
Eastside Sub-Area															
ES-1	Delineation of the vertical and lateral extent of perchlorate and chlorate in the alluvium and upper portion of the UMCf	120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-1	4" PVC	0.01	95-110	93-110	Middle WBZ	No. 2/12
ES-2		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-2	4" PVC	0.02	45-65	43-65	Shallow WBZ - Alluvium	No. 3
ES-3		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-3	4" PVC	0.02	45-65	43-65	Shallow WBZ - Alluvium	No. 3
ES-4		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-4	4" PVC	0.01	70-90	68-90	Shallow WBZ - UMCf	No. 2/12
ES-5		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-5	4" PVC	0.01	70-85	68-85	Shallow WBZ - UMCf	No. 2/12
ES-6		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-6	4" PVC	0.01	55-75	53-75	Shallow WBZ - UMCf	No. 2/12
ES-7		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-7	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12
ES-8		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-8A	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12
									ES-8B[4]	4" PVC	0.01	90-110	88-110	Middle WBZ	No. 2/12
ES-9		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-9	4" PVC	0.01	80-100	78-100	Shallow WBZ - UMCf	No. 2/12
ES-10		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-10	4" PVC	0.01	45-65	43-65	Shallow WBZ - UMCf	No. 2/12
ES-11		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-11	4" PVC	0.01	35-55	33-55	Shallow WBZ - UMCf	No. 2/12
ES-12		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-12	4" PVC	0.01	45-65	43-65	Shallow WBZ - UMCf	No. 2/12
ES-13		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-13	4" PVC	0.01	90-105	88-105	Middle WBZ	No. 2/12
ES-14		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-14A	4" PVC	0.01	45-65	43-65	Shallow WBZ - UMCf	No. 2/12
									ES-14B	4" PVC	0.01	100-115	98-115	Middle WBZ	No. 2/12
ES-15		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-15	4" PVC	0.01	70-90	68-90	Shallow WBZ - UMCf	No. 2/12
ES-16		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-16	4" PVC	0.01	80-100	78-100	Middle WBZ	No. 2/12
ES-17		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-17	4" PVC	0.01	80-100	78-100	Middle WBZ	No. 2/12
ES-18		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-18	4" PVC	0.01	80-100	78-100	Middle WBZ	No. 2/12
ES-19		200	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200	20	X	X		X	ES-19	4" PVC	0.01	90-110	88-110	Middle WBZ	No. 2/12

TABLE 6-5 (Revised). SOIL SAMPLING AND WELL CONSTRUCTION AT NEW GROUNDWATER MONITORING WELLS
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Revision Date: 12/2017

Pilot Boring Number	Rationale for Sampling	Planned Soil Samples [1]			Soil Analytical Testing Program [2]				Construction Details for New Wells [1,3]						
		Boring Depth (ft bgs)	Planned Soil Sample Depths (ft bgs)	No. of Samples	Perchlorate	Chlorate	Total Chromium	Moisture Content	Monitoring Well ID	Casing Diameter and Type	Screen Size (inches)	Screened Interval (ft bgs)	Sand Pack Interval (ft bgs)	Target WBZ	Sand Pack Size
ES-20	Delineation of the vertical and lateral extent of perchlorate and chlorate in the alluvium and upper portion of the UMCf	200	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200	20	X	X		X	ES-20	4" PVC	0.01	90-110	88-110	Middle WBZ	No. 2/12
ES-28		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-28	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12
ES-29		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-29	4" PVC	0.01	50-70	48-70	Shallow WBZ - UMCf	No. 2/12
ES-30		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-30	4" PVC	0.01	45-65	43-65	Shallow WBZ - UMCf	No. 2/12
ES-31		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-31	4" PVC	0.01	45-65	43-65	Shallow WBZ - UMCf	No. 2/12
ES-32		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X		X	ES-32[5]	4" PVC	0.01	40-60	38-60	Shallow WBZ - UMCf	No. 2/12
Northeast Sub-Area															
ES-21	Delineation of the vertical and lateral extent of perchlorate and chlorate in the alluvium and upper portion of the UMCf	120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-21A	4" PVC	0.02	30-50	28-50	Shallow WBZ - Alluvium	No. 3
									ES-21B	4" PVC	0.01	60-80	58-80	UMCf	No. 2/12
ES-22		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-22A	4" PVC	0.02	30-50	28-50	Shallow WBZ - Alluvium	No. 3
									ES-22B	4" PVC	0.01	60-80	58-80	UMCf	No. 2/12
ES-23		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-23A	4" PVC	0.02	30-50	28-50	Shallow WBZ - Alluvium	No. 3
									ES-23B	4" PVC	0.01	60-80	58-80	UMCf	No. 2/12
ES-24		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-24	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12
ES-25		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-25A	4" PVC	0.02	30-50	28-50	Shallow WBZ - Alluvium	No. 3
									ES-25B	4" PVC	0.01	60-80	58-80	UMCf	No. 2/12
ES-26		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-26	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12
ES-27		120	10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120	12	X	X	X	X	ES-27	4" PVC	0.01	60-80	58-80	Shallow WBZ - UMCf	No. 2/12

TABLE 6-5 (Revised). SOIL SAMPLING AND WELL CONSTRUCTION AT NEW GROUNDWATER MONITORING WELLS
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Revision Date: 12/2017

Pilot Boring Number	Rationale for Sampling	Planned Soil Samples [1]			Soil Analytical Testing Program [2]				Construction Details for New Wells [1,3]						
		Boring Depth (ft bgs)	Planned Soil Sample Depths (ft bgs)	No. of Samples	Perchlorate	Chlorate	Total Chromium	Moisture Content	Monitoring Well ID	Casing Diameter and Type	Screen Size (inches)	Screened Interval (ft bgs)	Sand Pack Interval (ft bgs)	Target WBZ	Sand Pack Size

Notes:

Well included in Phase 3 RI Work Plan, Modification No. 1 scope.

ft bgs: feet below ground surface

[1] Soil sample depths and well construction details may be modified based on subsurface lithologies encountered during drilling.

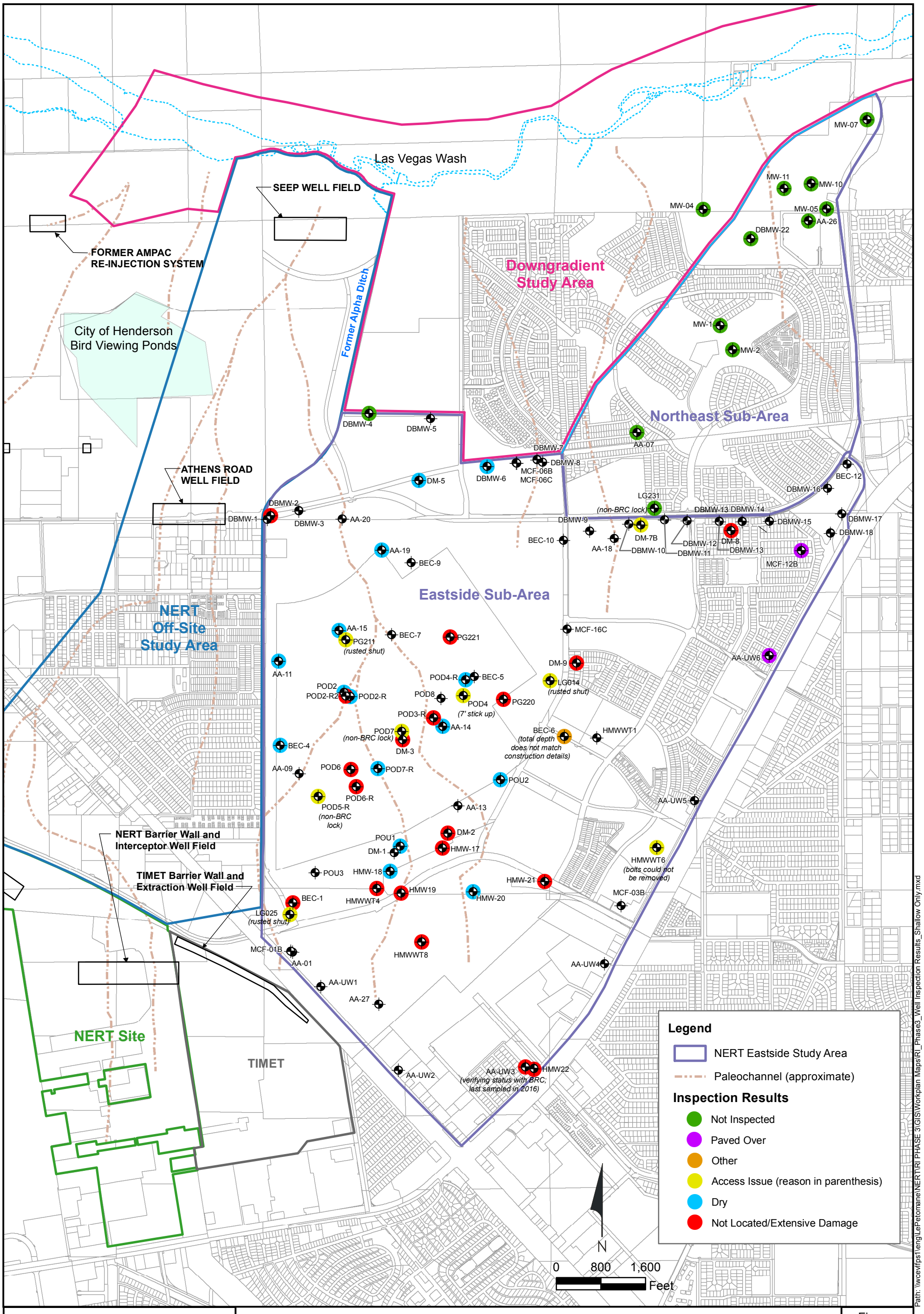
[2] Approximately 20% of the soil samples will be tested for physical properties, including Atterberg Limits (ASTM D4318), USCS Classification (ASTM D2487), grain size distribution (ASTM D422/D4464 combined or ASTM 4464 laser method), porosity (ASTM D425 modified), bulk density (ASTM D2937), and fraction organic carbon (foc) (Walkley Black). Approximately 5% of the soil samples will be selected for vertical permeability testing.

[3] New monitoring wells in the Eastside Study Area will be sampled for perchlorate and chlorate (Northeast Sub-Area wells will also be sampled for total chromium and hexalvalent chromium), and general chemistry parameters including total dissolved solids (TDS) and majors ions (calcium, magnesium, sodium, potassium, sulfate, nitrate, chloride, and bicarbonate/carbonate/hydroxide alkalinity). Field parameters including temperature, pH, dissolved oxygen (DO) and oxygen reduction potential (ORP), turbidity, and electrical conductivity (EC) will be measured during sampling. See Tables 6-2 and 6-3 within Phase 3 RI Work Plan, Revision 1.

[4] ES-8 has been renamed ES-8B due to the installation of paired well ES-8A as part of Modification No. 1. The construction details for ES-8B are identical to ES-8.

[5] The installation of well ES-32 is considered preliminary. The need for a permanent monitoring well at this location will be evaluated based on results from the adjacent soil boring ESB-2.

FIGURES



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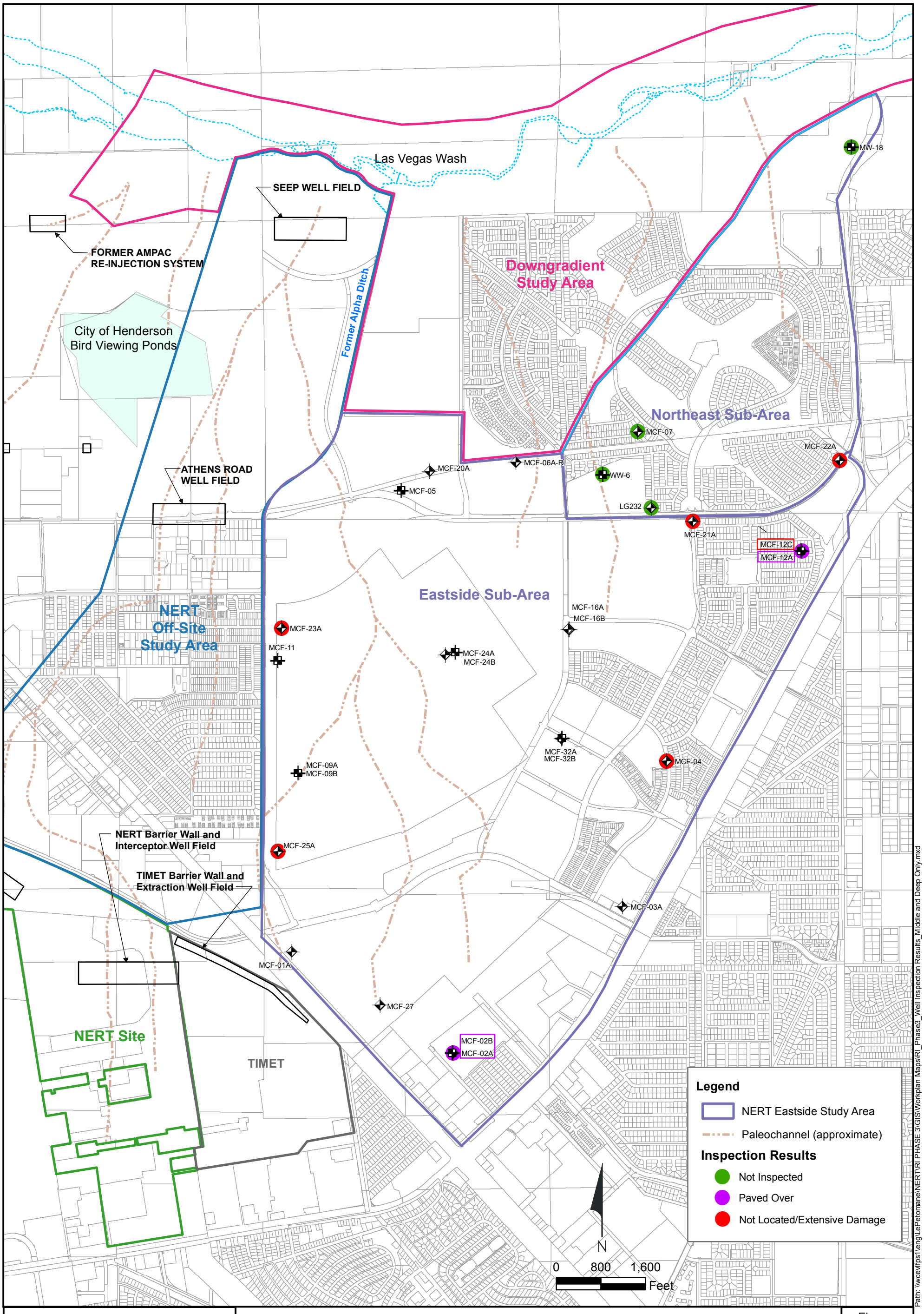
Shallow Well Inspection Results
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Figure
1

Drafter: RS	Date: 5/5/17	Contract Number: 21-41400C	Approved by:	Revised:



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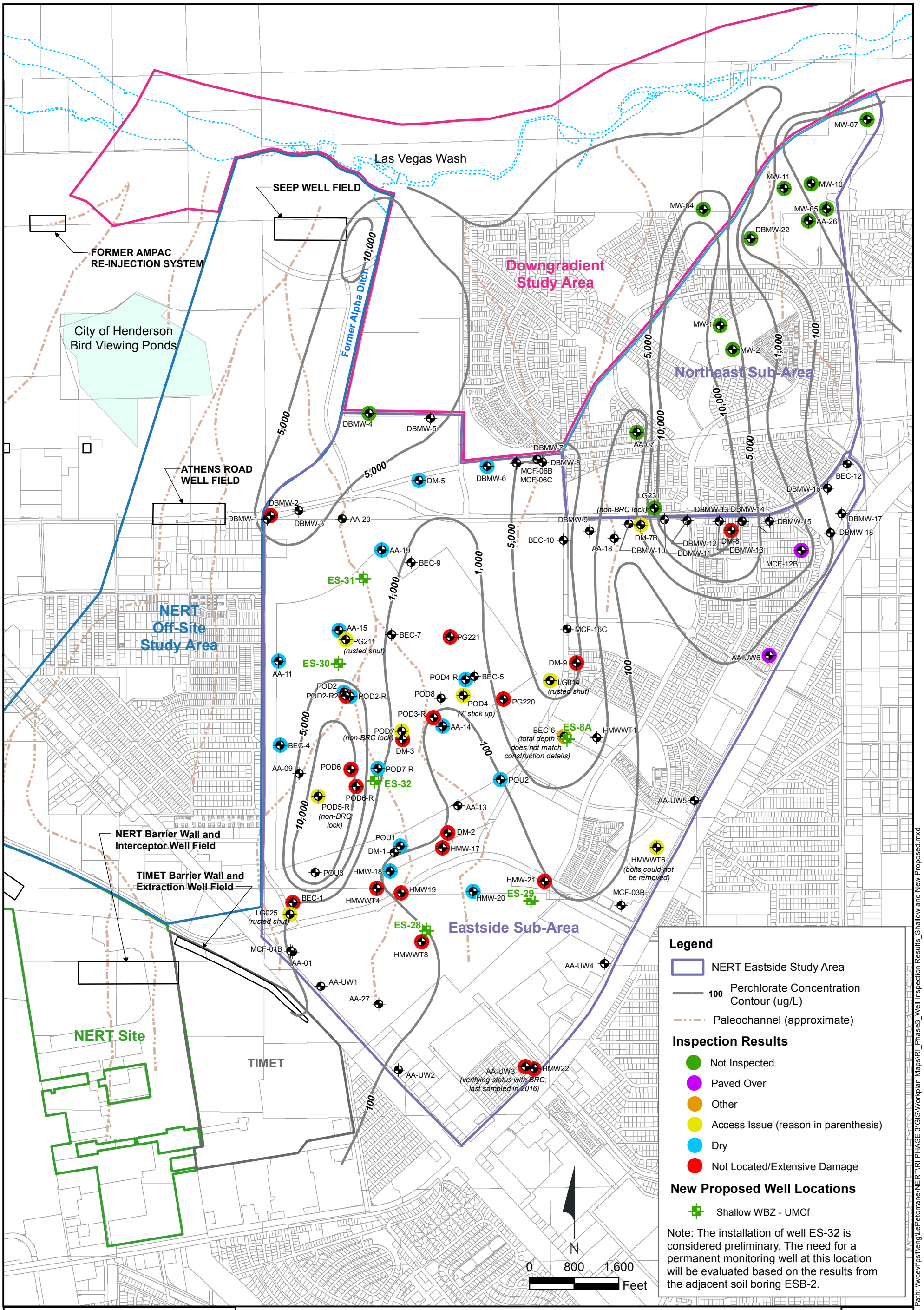
Middle WBZ (90-270 ft bgs) and Deep WBZ (>270 ft bgs) Well Inspection Results

Phase 3 RI Work Plan, Modification No. 1

Nevada Environmental Response Trust Site; Henderson, Nevada

Figure **2**

Drafter: RS	Date: 5/5/17	Contract Number: 21-41400C	Approved by:	Revised:



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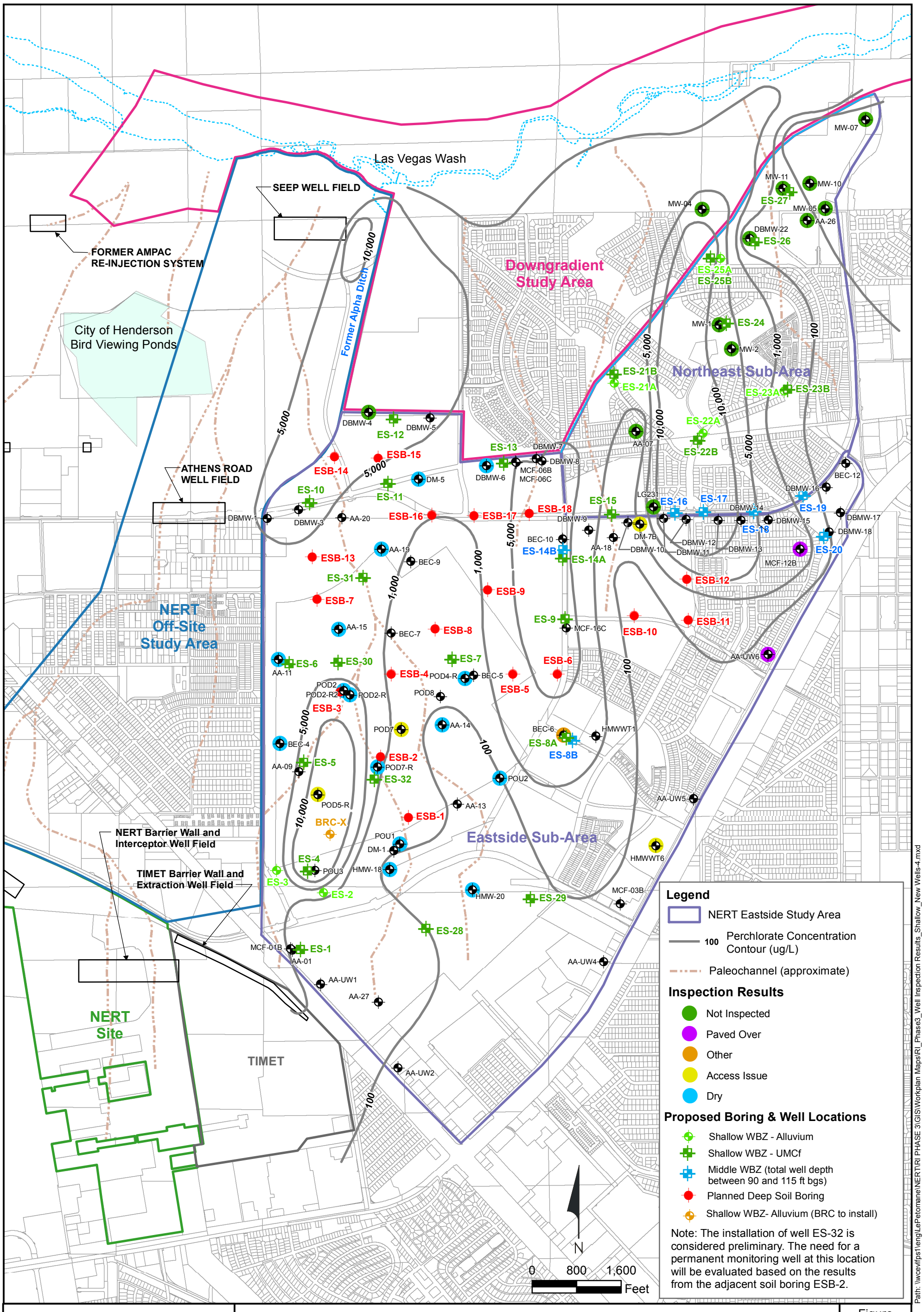
Shallow Well Inspection Results and New Proposed Well Locations
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Figure
3

Drafter: RS	Date: 5/5/17	Contract Number: 21-41400C	Approved by:	Revised:



Legend

- NERT Eastside Study Area
- 100 Perchlorate Concentration Contour (ug/L)
- Paleochannel (approximate)

Inspection Results

- Not Inspected
- Paved Over
- Other
- Access Issue
- Dry

Proposed Boring & Well Locations

- Shallow WBZ - Alluvium
- Shallow WBZ - UMCf
- Middle WBZ (total well depth between 90 and 115 ft bgs)
- Planned Deep Soil Boring
- Shallow WBZ- Alluvium (BRC to install)

Note: The installation of well ES-32 is considered preliminary. The need for a permanent monitoring well at this location will be evaluated based on the results from the adjacent soil boring ESB-2.

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Planned Boring Locations/Planned and Existing Monitoring Well Locations
Phase 3 RI Work Plan, Modification No. 1
Nevada Environmental Response Trust Site; Henderson, Nevada

Figure **4**

Drafter: RS | Date: 5/5/17 | Contract Number: 21-41400C | Approved by: | Revised:

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ALL WELLS DATABASE UPDATE
(INCLUDED ELECTRONICALLY)