

Final Report

**Locating Orphaned and/or Abandoned Underground
Storage Tanks (USTs) within the State of Nevada, Leaking
Underground Storage Tank Trust Fund Assistance Award,
American Reinvestment & Recovery Act (ARRA) of 2009**

Prepared for

Nevada Division of Environmental
Protection – Bureau of Corrective Action
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Prepared by

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Department of Conservation and Natural Resources
Division of Environmental Protection
Bureau of Corrective Actions
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701

Attn: Mr. Kevin Sullivan

RE: Final Report, Locating Orphaned and/or Abandoned Underground Storage Tanks (USTs) within the State of Nevada, Nevada Division of Environmental Protection.

Dear Mr. Sullivan:

Broadbent & Associates, Inc. (BAI) is pleased to submit this Final Report for Locating Orphaned and/or Abandoned Underground Storage Tanks (USTs) within the State of Nevada. Activities were conducted for Nevada Division of Environmental Protection (NDEP) under the Leaking Underground Storage Tank Trust Fund Assistance Award, Funded under the American Reinvestment & Recovery Act (ARRA) of 2009. This Work Plan was based upon various Scopes of Work (SOW) previously approved by NDEP, on December 1, 2009, October 7, 2010 and May 11, 2011, respectively.

Broadbent & Associates, Inc. appreciates the opportunity to provide technical services to you. Should you have questions regarding this submittal, please do not hesitate to call (775) 322-7969.

Sincerely,
BROADBENT & ASSOCIATES, INC.



Eric M. Seitz,
Project Manager



Douglas G. Guerrant, P.G., C. HG., C.E.M. #1334 (Exp. 2/2/2012)
Principal Hydrogeologist

Enclosure: Final Report for Locating Orphaned and/or Abandoned
Underground Storage Tanks (USTs) within the State of Nevada

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EXECUTIVE SUMMARY

Broadbent & Associates, Inc. was contracted by the State of Nevada Division of Environmental Protection (NDEP) to locate, inventory, and prioritize for environmental assessment, orphaned and/or abandoned underground storage tanks (USTs) within the state of Nevada. Activities were conducted as part of the Leaking Underground Storage Tank Trust Fund Assistance Award, funded under the American Reinvestment & Recovery Act (ARRA) of 2009. The objective of this investigation was three-fold: 1) Review available resources in an effort to locate and build an inventory of orphaned and/or abandoned UST sites within the state of Nevada that, at the time they were taken out of service, were not properly assessed and/or closed (Phase I); 2) refine the Phase II inventory list by conducting more detailed field investigations (Phase II); and 3) correctly classify sites identified during Phases I and II and conduct tank closure assessment activities on identified sites that were suspected to contain orphaned and/or abandoned USTs that potentially represent a hazard to human health and/or the environment (Phase III).

Project objectives were achieved by conducting extensive research, communication, and field activities. With NDEP input, a site inventory design and content platform for data storage and processing was developed. A Microsoft Access database was developed and an ESRI ArcView File Geodatabase was constructed to store all geospatial data developed during the investigation. The state was divided into three primary regions and a team of 15 local Research & Field Assistants (RFAs) was hired and trained, in addition to assignment of three Regional Managers and an overall Project Manager, to assist with research and field reconnaissance activities.

During Phase I investigation activities, a total of 182 potentially orphaned and/or abandoned UST sites were identified. Gathered research and field data was entered into the Access database and integrated into a Personal Geodatabase. Site location and scoring activities were conducted using a detailed Geographic Information System (GIS). A designed Site Scoring System (SSS) was then utilized to create a total site score for each identified site, in order to determine potential for impact to human health and/or the environment. Scored sites were then ranked from highest priority to lowest priority (1 through 182). Identified sites were sorted into three different formats: 1) Potential for environmental impact (1-182); 2) Site Name; and 3) County.

Extensive correspondence and interaction with property owners, during Phase II, resulted in a refined list of the 182 sites. These stakeholders were provided multiple opportunities to correspond with investigation personnel, assuring property owners the ability to become informed about this investigation, their responsibilities as site owners, and available methods of resolution to potential UST obligations.

Both orphaned and abandoned USTs were discovered during Phase II, in addition to discovery of numerous documented and/or non-regulated USTs. Sites possessing orphaned USTs were given priority over sites possessing abandoned USTs. Sites determined to be "previously documented" (i.e., sites already having been issued an NDEP facility ID number) were cleared of obligations relative to this investigation. Additionally, sites determined to possess non-regulated USTs, with no reporting requirements applicable, were also cleared of obligations relative to this investigation.

General Phase II investigation results included:

- 119 sites were cleared of obligations relative to this investigation
- 30 site owners were non-responsive or not findable with available information
- 30 sites required additional investigation
- Three sites were identified for subsurface assessment

The objective of Phase III was to correctly classify sites identified during Phase I and II, and to conduct tank and line closure activities for sites identified to potentially possess orphaned and/or abandoned USTs. At the conclusion of Phase III activities, all 182 originally identified sites were assigned one of the following classifications:

- Pre-regulation UST(s): cleared of undocumented UST obligations
- No UST(s) present: cleared of undocumented UST obligations
- UST(s) previously identified by NDEP: cleared of undocumented UST obligations
- Owner non-responsive, referred to NDEP: not cleared of undocumented UST obligations
- Investigation open, referred to NDEP: not cleared of undocumented UST obligations

Additionally, a total four identified sites (three from Phase II and one from Phase III) received a detailed field investigation, three of which were found to possess USTs. Those discovered USTs were subjected to tank closure assessment activities, one of which was found to have impacts (Old West Station, Wells, NV). Additional site characterization and mitigation activities, in conjunction with conduct of a risk based evaluation of remaining impacts, resulted in a recommendation for site closure for Old West Station site.

Overall investigation results include:

- 182 sites identified
- 147 sites cleared of obligations relative to this investigation
- 35 sites remain in question and were referred to NDEP for further consideration
- Four sites were subject to detailed field assessment, three of which were found to possess USTs, one of which was found to have had a release (Old West Station, Wells, NV)
- After completing extensive site investigation and risk based assessment, Old West Station was recommended for case closure

1.0 INTRODUCTION

Broadbent & Associates, Inc. (BAI) has been contracted by the State of Nevada to locate, inventory, and prioritize for environmental assessment, orphaned and/or abandoned underground storage tanks (USTs) within the state of Nevada. Activities were conducted for the Nevada Division of Environmental Protection (NDEP) under LUST Trust Tasks #BA-05, BA-08B, and BA-09B, as part of the Leaking Underground Storage Tank Trust Fund Assistance Award, funded under the American Reinvestment & Recovery Act (ARRA) of 2009. This investigation was carried out in three distinct phases, each associated with Work Plans approved by NDEP on December 1, 2009, October 7, 2010 and May 11, 2011, respectively. Definitions for orphaned and abandoned USTs are as follows:

Orphaned Tank (per State Board to Review Claims Resolution No. 96-002):

An abandoned tank with no current owner, in that the current land owner had no knowledge of the tanks presence and never utilized the tank.

Abandoned Tank (per NAC 459.994):

- a) A storage tank that is not maintained and whose owner or operator has not provided NDEP with a written statement of their intention to close the storage tank; or
- b) A storage tank that is not in service and does not comply with 40 CFR 280.70 or 280.71.

2.0 OBJECTIVE/PURPOSE

The objective of this investigation was three-fold: 1) Review available resources in an effort to locate and build an inventory of orphaned and/or abandoned UST sites within the state of Nevada that, at the time they were taken out of service, were not properly assessed and/or closed (Phase I); 2) refine the Phase II inventory list by conducting more detailed field investigations (Phase II); and 3) conduct tank closure assessment activities on identified sites that appear to contain orphaned and/or abandoned USTs that potentially represent a hazard to human health and/or the environment (Phase III). The ultimate investigation result was designed to be the report provided herein documenting this state wide investigation and providing a prioritized list of potential orphaned and/or abandoned UST sites.

3.0 PROJECT APPROACH

As discussed above, the objectives of this investigation were accomplished by conducting work in three separate phases. Each of these phases included separate goals, achieved through completion of phase-specific tasks. Phase specific goals, activities, and results are provided within their respective sections below. Orphaned USTs were given priority over abandoned USTs for potential liability purposes. As such, the investigation was designed to locate and address USTs that were not properly closed, not to create environmental liabilities for property owners. As the investigation progressed, careful consideration was given to this matter. Additionally, care was taken to observe if any sites researched and/or identified represented an immediate threat to human health and/or the environment. If such as site

was identified, then all other activities were to be ceased and full attention and resources were to be applied to this identified site.

Project staff gathered potential site information and, in most cases, participated in extensive correspondence with property owners. Stakeholders were assured that prior to interaction and correspondence with project staff, non-relevant information regarding their sites would not be published or distributed to the public. During dialogue with property owners, BAI personnel were careful to inform property owners of their responsibilities as owners of previously undocumented USTs, as well as methods available to release their properties from potential obligations regarding previously undocumented USTs.

4.0 PHASE I ACTIVITIES

4.1 PHASE I INTRODUCTION

Phase I activities were conducted during the period of January 2010, to June 2010. Work was based upon an NDEP approved December 1, 2009 detailed Phase 1 Work Plan.

To facilitate Phase I activities, the state was divided into three geographical regions: 1) West; 2) South; and 3) North & East. Primary areas of interest, generally located along major roadways, were established within each geographic region to conduct the investigation. A total of 15 primary areas of interest were established. Local Research & Field Assistants (RFAs) were hired and trained, within each area of interest, to assist with research and field reconnaissance activities. Additionally, one Regional Manager was hired/assigned to each of the three established geographic regions (West Region, South Region, and North & East Region) to organize and manage activities and RFAs within their respective Region.

A site inventory design and content platform for data storage and processing was developed for this investigation. A Microsoft Access database was developed and an ESRI ArcView File Geodatabase was constructed to store all geospatial data developed during the investigation.

Representatives from BAI and the NDEP contacted county commissioners and leaders of select cities and towns throughout Nevada to describe the purpose and intent of this project. BAI representatives presented program information at meetings with county commissioners, city/town councils, town advisory boards, and public works departments throughout the state to inform community leaders and local citizens of the project and its intent, and to gather local input/knowledge. Additionally, Regional Managers and RFAs interviewed local citizens regarding input/knowledge of potential orphaned and/or abandoned UST sites located in their community.

A total of 182 potential orphaned and/or abandoned UST sites were identified during this Phase I investigation. Each of these sites was assigned a unique site ID. Field data was entered into the Access database and integrated into a personal Geodatabase. Site location and scoring were conducted using a detailed Geographic Information System (GIS). A designed Site Scoring System (SSS) was then utilized to create a site score for each identified site, in order to determine potential for impact to the environment

and/or human health. Scored sites were then ranked from highest priority to lowest priority (1 through 182). Identified sites were sorted into three different formats: 1) by ranking of environmental importance (1-182), provided in Index A; 2) sorted by Site Name, provided in Index B; and 3) sorted by County, provided in Index C.

The approach to Phase I activities was comprised of three primary tasks: 1) Project Planning; 2) Project Development; and 3) Project Reporting (Deliverables). Under the Project Planning task, geographic regions to be investigated were established, including primary areas of interest. Additionally, the type of data/information needed and the systems to assemble, organize, interpret, prioritize, and present the collected information were determined. In this case, a Microsoft Access database and a detailed geographic information system (GIS) were utilized.

Under the Project Development task, required data/information was collected and an evaluation system was constructed using a Microsoft Access database and detailed GIS. Subsequently, a Site Scoring System (SSS) and Site Priority List (SPL) were developed utilizing the relational database and GIS. The identified orphaned and/or abandoned UST sites were then prioritized, for assessment, in order of highest to lowest risk to the environment and/or public health.

Under the Project Deliverable task, the format for presenting investigation details and results was established and includes both hard copy and electronic deliverables.

Details for each of these three primary tasks are provided in the following Sections.

4.2 PHASE I PROJECT PLANNING

Tasks completed as part of project planning included the following: 1) define the organizational structure; 2) establish geographic regions within the state; 3) identify primary areas of interest within each region; 4) determine the Site Inventory System Design and Content; 5) evaluate and determine staffing requirements to complete the investigation; 6) determine a schedule to develop and complete the investigation. Details for each of these conducted tasks are provided below.

4.2.1 Organization

The organizational structure for conducting this investigation is depicted on Figure 1, attached. Review of Figure 1 indicates that the federal Environmental Protection Agency (EPA) and the NDEP – Bureau of Corrective Actions (BCA) are the overall stakeholders and BAI is the retained primary contractor. BAI staffed this investigation with a Program Manager, a project specific Project Manager, three Regional Managers, two database & GIS managers, and 15 RFAs. Details for these positions are provided in Section 4.2.5, below.

4.2.2 Geographic Regions

To facilitate this investigation, the state was divided into three geographical regions: 1) West; 2) South; and 3) North & East. The attached Figure 2 demonstrates the project investigation regions. To coordinate and facilitate research and field reconnaissance activities, each region was assigned a Regional

Manager. The West Region, illustrated in blue, includes Carson City, Churchill, Douglas, Lyon, Mineral, Storey, and Washoe counties. The South Region, illustrated in red, includes Clark, Esmeralda, Lincoln, and Nye counties. The North & East Region (illustrated in green) includes Elko, Eureka, Humboldt, Lander, Pershing, and White Pine counties.

4.2.3 Primary Areas of Interest

Primary areas of interest, within each geographic region, were identified for this investigation. As illustrated on Figure 3, the primary areas of interest are generally located along major roadways. Cities and towns researched during this investigation are shown below and depicted on Figure 3. Cities/towns listed below in bold print were designated as core cities/towns within their respective area.

Designated Areas	Cities/Towns
West Region Areas	
W1	Reno/Sparks
W2	Fallon/Fernley/Wadsworth/Gerlach/Empire
W3	Carson City/Virginia City/Dayton/Silver Springs
W4	Minden/Gardnerville/Wellington/Smith/Stateline/East Shore Tahoe
W5	Hawthorne/Yerington/Schurz/Luning/Mina/Gabbs
South Region Areas	
S1	Las Vegas/North Las Vegas
S2	Henderson/Boulder City/Searchlight/Laughlin/Jean
S3	Mesquite/Overton/Moapa/Logandale/Bunkerville
S4	Pioche/Caliente/Alamo/Panaca/Hiko
S5	Beatty/Amargosa Valley/Indian Springs/Pahrump
S6	Tonopah/Goldfield/Coaldale/Round Mountain/Lockes/Warm Springs
North & East Region Areas	
NE1	Elko/Battle Mountain/Carlin/Valmy/Mountain City/Owyhee
NE2	Winnemucca/Lovelock/Imlay/Mill City/Golconda/Orovada/McDermitt
NE3	Ely/Eureka/Austin/ McGill/Ruth/Baker
NE4	Wells/Jackpot/West Wendover/Halleck/Deeth

4.2.3.1 West Region

The West Region's primary areas of interest included: the Interstate 80 corridor from the NV-CA border to the northern boundary of Churchill County; the Highway 50 corridor from the state line in South Lake Tahoe to the eastern boundary of Churchill County; the Highway 395 corridor from the NV-CA border in the north to the NV-CA border to the south; and the old Highway 40 corridor through Reno,

and beyond. Additionally, select cities and towns within the Region were investigated including: Reno, Sparks, Fallon, Carson City, Minden, Hawthorne, and Yerington.

4.2.3.2 South Region

The South Region's primary areas of interest included: the Highway 95 corridor from the northwestern Esmeralda County line to the NV-CA border; the Highway 93 corridor from the northern Lincoln County line to the NV-AZ border; and the Interstate 15 corridor from the NV-AZ border to the NV-CA border. Additionally, select cities and towns within the Region were investigated including: Las Vegas, Henderson, Boulder City, Mesquite, Pioche, Beatty, Tonopah, and Goldfield.

4.2.3.3 North & East Region

The North & East Region's primary areas of interest included: the Interstate 80 corridor from the southern Pershing County line to the NV-UT border; the Highway 50 corridor from the western Lander County line to the NV-UT border; and the old Highway 40 corridor (somewhat along the same path as the current Interstate 80 corridor). Additionally, select cities and towns within the Region were investigated including: Elko, Winnemucca, Eureka, Wells, Austin, Ely, Lovelock, Battle Mountain, and West Wendover.

4.2.4 Site Inventory Design & Content

Subsequent to establishing geographic regions and identifying primary areas of interest, a site inventory design and content platform for data storage and processing was developed. Microsoft Access database software was utilized for this purpose which facilitated systematic formatting, categorizing, and prioritizing collected field data. Site-specific information entered into this database included the following:

- Parcel ID Number
- Property location (address, town, county, zip code)
- Property coordinates (latitude/longitude)
- Past owner(s) name and contact information
- Present owner name and contact information
- Property size
- Former use(s)
- Current use(s)
- Presence of historical structures
- Roadway access
- Site Score

Multiple geospatial data sets were collected from outside sources and integrated to develop the personal file Geodatabase which was then utilized for site analysis. These data sets (and their sources) include the following:

- Roadways – Nevada DOT
- Railroads – Nevada DOT
- Surface Water – USGS
- Drinking Water and Wells – NDWR
- Depth to Water (Water Table) – NDWR & USGS
- Annual Precipitation – NOAA Climatic Data or Nevada State Climatologist
- Archaeology – Nevada State Historic Preservation Office
- Sensitive Wildlife Habitat – Nevada Department of Wildlife
- Endangered Plant Species – Nevada Heritage Foundation
- Soil Type – U.S. Department of Agriculture
- Quadrangle Maps – USGS
- Historical Maps – University of Nevada System (geo-referenced)
- Historical Maps – Sanborn Maps[®] (geo-referenced)
- Nearby sensitive ecosystems

4.2.5 Staffing

A total of 22 staff members plus administrative assistants were required to implement and complete this project, including: one Program Manager, one Project Manager, two Database & GIS Data Managers, three Regional Managers, and fifteen Research & Field Assistants. The roles of these twenty-two staff members are discussed below. Eighteen of these twenty-two positions were newly created jobs.

4.2.5.1 Program & Project Managers

Mr. Douglas Guerrant was the overall ARRA Program Manager. He was responsible for contract management, billing, and project reporting. Mr. David Howard was the project specific Project Manager. He was responsible for hiring RFAs, managing Regional Managers and database and GIS managers, reporting project updates, and preparing deliverables to NDEP.

4.2.5.2 Access Database & GIS Manager

Mr. Eric Seitz was hired to construct and maintain collected data using Microsoft Access software. Mr. Seitz managed the project data and conducted the geospatial analysis and site evaluations. He was responsible for collecting/acquiring existing public domain geospatial data and building a Personal Geodatabase that included collected local site information. Mr. Justin Gerthoffer helped design the Microsoft Access database, conducted database queries, and produced site scoring reports. Additionally, he prepared the AutoCAD figures and photo logs for each identified site.

4.2.5.3 Regional Managers

One Regional Manager was assigned to each of the three established geographic regions (West Region, South Region, and North & East Region) to organize and manage activities within their respective Region. Furthermore, each Regional Manager supervised the team of RFAs assigned to their respective region. Mr. Darin Galloway was assigned the West Region; Mr. Kirk Stowers the South Region; and Mr. Aaron Sonerholm the North & East Region.

4.2.5.4 *Research & Field Assistants (RFAs)*

Fifteen RFAs were hired and assigned to specific geographic areas throughout the state. Five RFAs were hired and assigned to the West Region which included: Mr. David Lindsey (W1), Ms. Christy Lattin (W2), Mr. Jake Johnson (W3), Mr. Brook Enos (W4), and Mr. Robert Eddy (W5). Six RFAs were hired and assigned to the South Region which included: Ms. Nancy Denman (S1), Mr. Colin McNee (S2), Mr. Matt Stinchfield (S3), Mr. Glennon Zelch (S4), Ms. Suzy McCoy (S5), and Mr. Rod Moyes (S6). Four RFAs were hired and assigned to the North & East Region which included: Ms. Diana DuBois (NE1), Mr. Jim Blattman (NE2), Mr. Paul Sonerholm (NE3), and Ms. Gaile Supp (NE4).

4.2.6 Schedule

Phase I activities were conducted during the period of October, 2009 through June, 2010. Figure 4 (attached) provides a Timeline for Phase I activities, from Scope of Work submittal through Final Report approval.

4.3 PHASE I PROJECT DEVELOPMENT

Phase I project development activities consisted primarily of creating the site inventory. Specific activities included: design templates for field reports, forms, and maps; research and acquire geospatial datasets/layers; model, construct and review Microsoft Access database; contact county and city/town leaders regarding project intent; recruit, hire, and train RFAs; collect data from designated primary areas of interest; conduct field reconnaissance and interviews; populate database with collected data; integrate database into GIS; evaluate and rank investigated sites through a scoring system; and prepare final GIS maps with prioritized data. Details for these activities are discussed below.

4.3.1 Design Templates

Field form templates and site scoring templates were designed for personnel to complete with critical site information and vicinity data required to properly categorize and prioritize orphaned and/or abandoned UST sites across the state. Data gathered from field research and site reconnaissance were entered into the Access database. Site scoring calculation spreadsheets were designed to incorporate ownership and site criteria into weighted values. These totaled values were then used to rank sites discovered during this investigation. These templates are discussed below.

4.3.1.1 *Field Reconnaissance Reports, Forms & Maps*

Field reconnaissance forms and site and vicinity maps were created and provided to the Regional Managers and RFAs. The field sheet templates are provided in Appendix A for reference. The field sheets were designed in a manner such that the Regional Managers and RFAs would understand the type of data required to conduct proper research and field reconnaissance and so that data were collected in a consistent manner. Data requested on the field sheets matches the data fields created in the Access database.

4.3.1.2 Site Scoring Calculation Sheets

Site Scoring Calculation Sheets were created to prioritize identified orphaned and/or abandoned UST sites. Collected data for each identified site were entered into the spreadsheet to calculate the site score, which was then used to rank and prioritize sites across the state.

4.3.2 GIS Data/Layers Research & Acquisition

As indicated above, multiple statewide geospatial data sets and community-specific data were collected and incorporated into the detailed GIS built for this investigation. This GIS was then utilized for calculating site-specific scores and for map presentation purposes. Development of the GIS data/layers was a vital component of this investigation and an essential tool for overall investigation, interpretation, and inventory presentation purposes. Data were standardized to ensure better data quality, reporting, and management. The GIS Personal Geodatabase was built using ESRI ArcView 9.3.1 software on a new Dell Precision T3400 Convertible MiniTower work station, which was purchased for this investigation.

4.3.3 Model & Design Access Database

A review of project goals and analysis of field reconnaissance data, necessary to complete an inventory of candidate sites, was conducted to develop a model for the Access database. Initial modeling was undertaken using Microsoft Excel, and then a multiple table relational database was created in Microsoft Access. Considerations were taken to assure that created tables were compatible with the Geodatabase.

4.3.4 Contact County & City/Town Leaders

NDEP contacted county commissioners and leaders of select cities and towns throughout Nevada, via a written letter dated December 3, 2009, to describe the purpose and intent of this project. BAI followed up with phone calls to these local representatives to further discuss the project. Additionally, these leaders were asked to implement their own local search of orphaned and/or abandoned UST sites. A copy of the program introduction letter and the mailing list for county commissioners and city/town leaders is provided in Appendix B.

4.3.5 Recruit, Hire, and Train RFAs

BAI hired a total of 15 RFAs from selected cities and towns across Nevada to conduct research and field reconnaissance for this project. The RFAs were trained to understand the procedures and protocol necessary to perform the outlined tasks. The plan to recruit, hire, and train RFAs to cover regions across the state is provided below.

4.3.5.1 Advertise in Core Cities/Towns for RFAs

One city or town within each designated area (15 total areas) was selected as a core city/town. RFAs were primarily recruited from core cities/towns to conduct research and field reconnaissance within

their respective area. Recruitment of RFAs began with a December 2009 advertising campaign. Advertising was conducted through: established contacts within each county; recommendations from local community leaders, agencies and/or groups; newspaper ads; a recruitment brochure; and/or local employment groups. After an extensive interview process, qualified individuals were selected and hired. These were newly created jobs. Core requirements to fill this position were as follows: currently unemployed or underemployed; a strong local history and knowledge of the planned investigation areas; and strong communication skills.

4.3.5.2 Evaluate Resumes, Conduct Interviews, and Hire RFAs

Resumes were evaluated to short list, interview, and ultimately select the best candidate for each area. These were newly created jobs. The position was filled as a Temporary BAI employee. The Project Manager and/or Regional Managers conducted the employee recruitment, interview, and selection process. The recruitment and hiring process was conducted during the initial stages of the Project Development portion of the project.

4.3.5.3 Conduct Training for RFAs

Hired personnel received training on protocol to follow in: researching their assigned area; how to conduct site specific investigations; and how to communicate with potential information resources and/or property owners. Detailed Field Reconnaissance Forms and Maps were distributed for use when conducting site-specific inspections as a means of providing both guidance and consistency when conducting site inspections. RFAs were provided hand-held GPS units and digital cameras to record site-specific data and photograph selected site features.

Separate training sessions were conducted by the Project Manager and Regional Managers for hired RFAs with sessions held in Reno, Henderson, and Elko, Nevada. Project specifics were explained in detail so that it was clear to the RFAs the purpose and objective of the investigation and how to accomplish their given tasks. Specifically, the RFAs were trained on the following subjects:

- The purpose of the project
- The difference between an orphaned and an abandoned UST
- How the state has been divided into Regions and primary areas of interest
- The method in which collected information will be assembled and entered into the database and GIS
- How to approach local community partners and citizens for assistance
- How to review local agency records and historical documents
- How to conduct site/field reconnaissance inspections
- How to use their hand-held GPS unit and record GPS coordinates
- How to set their digital camera and record photographs
- How to complete Field Reconnaissance Reports, Forms, & Maps

4.3.6 Local Data Collection

Local level data were collected by Regional Managers and RFAs, and entered into the Access database. Resources utilized to acquire local data included: local community leaders; local historians/groups/societies; historical maps; historical and current aerial photographs; property ownership review; regulatory agency records review; personnel interviews; library databases; building and fire department records review; business directories; and old phone books.

4.3.6.1 Partner Queries

Key stakeholders in local communities were contacted by NDEP and BAI to inform them of this project and to allow them to assist the project in identifying potential orphaned and/or abandoned UST sites within their city/town. Key stakeholders contacted during this investigation included: county commissioners; city/town councils; local real estate brokers; local developers; local bankers; city/town managers and public works directors; city/town health departments; community organizations (chambers of commerce, clubs, societies, groups); and senior citizen retirement homes. Stakeholders were provided Site Information Forms and asked to self-identify sites and provide relevant data.

4.3.6.2 Agency File Review & Interviews

State, county, and local agency files were reviewed by the Regional Managers and RFAs to identify possible orphaned and/or abandoned UST sites. Agencies included NDEP and County and City/Town Departments (such as Assessor, Health, Recorder, Environmental, Engineering, Fire, and Public Works). Interviews were conducted with City/Town Mayors, Managers, Public Works Directors, Engineering Directors, and Fire Departments.

4.3.6.3 Community Meetings & Interviews

An effective method of collecting inventory data came from direct surveys and interviews with knowledgeable parties, such as residents who have lived in the community for many years. BAI representatives presented program information at meetings with County Commissioners, City/Town Councils, Town Advisory Boards, and Public Works Departments throughout the state to inform community leaders and local citizens of the project and its intent, and to gather local input/knowledge. Table 1 lists meeting locations where BAI representatives presented program information.

4.3.6.4 Review Historical Documents

The Regional Managers, Data Manager, and RFAs reviewed historical documents, such as historical maps, aerial photos, and local building and fire department records to evaluate potential orphaned and/or abandoned UST sites. Other valuable documents included historical city directories, business directories, phone books, and building/property inspection reports.

4.3.7 Develop Field Investigation Maps

Field investigation maps were generated utilizing the GIS depicting population centers (cities and towns), roadways, railroads, surface water, county cadastral data, water supply wells, depth to water, public and private lands, and other pertinent information. The field investigation maps were provided to the Regional Managers and RFAs to assist in data collection and site assessment activities.

4.3.7.1 Site Inspections

Site visits/inspections were conducted by RFAs to field verify the presence or absence of UST(s) at each identified site. Global Positioning System (GPS) coordinates (Datum NAD 83 meters) for each identified site (with or without a confirmed UST) were recorded by RFAs using field GPS hand-held equipment (Garmin Etrex Legend H GPS Navigator) which were set to latitude/longitude decimal degrees (NAD 83 meters). Recorded GPS coordinates were incorporated into the Access database and GIS to update preliminary UST location(s) on specific sites. Additionally, photographs of the identified sites were taken with a digital camera.

4.3.7.2 Locate Other Potential

As an additional investigation/research measure, RFAs conducted visual “drive-by” surveys within their assigned area in an attempt to locate potentially orphaned and/or abandoned UST sites not previously identified via the literature search process. The RFAs searched for closed facilities and/or abandoned properties (i.e. former gasoline service stations) as possible candidates for orphaned and/or abandoned USTs

4.3.7.3 Complete Reports, Forms & Maps

Field Reconnaissance Reports, Forms, and Maps were used by RFAs, during field activities, to record site-specific information including: site name, site address, parcel identification number, GPS coordinates (latitude & longitude), owner contact information, parcel dimensions, former uses, current uses, and presence of historical structures. Each site was photographed and site maps were prepared depicting on-site features, including: buildings, canopies, UST pad(s), condition of property, and surface features (e.g. pavement, monitor wells, utilities, etc.). Additionally, vicinity maps were prepared, depicting off-site features, within approximately one mile of the property, including: adjacent properties, adjacent thoroughfares, railroad tracks, water supply wells, rivers or lakes, and major dry washes.

4.3.7.4 Submit Reports, Forms & Maps

Upon identification of a site, RFAs submitted their completed field reconnaissance forms, maps, and digital photographs to their Regional Manager. Field forms and maps were scanned and stored electronically as PDF documents. Data from these field sheets were then entered into the Access database.

4.3.8 Process Collected Data

4.3.8.1 Populate Access Database

Field reconnaissance information, detailed in Section 4.4, was entered into the Access database on an as ready basis. Identified sites were cross referenced with the existing NDEP UST database to determine if the sites were registered with the state. Input of data, as provided by RFAs and Regional Managers, allowed for review and refinement of field and office methodologies. Collected data was stored locally and backed up on the BAI network server. The identified sites database will be provided in electronic format to NDEP.

4.3.8.2 Consolidate Geospatial Data

Geospatial data acquired from state and federal agencies was edited and integrated into both Access and ArcMap. The geospatial data was critical in measuring environmental sensitivity criteria, such as distance to surface water and water supply wells, from each of the identified sites. As discussed herein, geospatial data was utilized to assist in assigning point values to specific criteria for each site.

4.3.8.3 Integrate Access Data into Geodatabase

Tables from the Access database were integrated into a personal Geodatabase using import tools provided by the ESRI 9.3.1 software suite. Of most importance was geospatial information (latitude and longitude in decimal degrees NAD 83 meters format) which was used to demonstrate site locations within the GIS.

4.3.8.4 GIS Analysis

GIS calculations were performed utilizing the developed Geodatabase, comprised of field reconnaissance information and geospatial datasets from state and federal agencies. These calculations produced statistical data, such as proximity of sites to environmentally sensitive areas.

4.3.9 Site Scoring

The collected geospatial, community, and site-specific data were entered into the Access database and developed GIS and then evaluated with a pre-designed SSS. Scoring results were then compiled with site name and location into a SPL.

The SSS Calculation Sheets include the following data (as applicable): ownership status; site environmental sensitivity; and Nevada Administrative Code (NAC) 459.9973, subpart 1 (a)-(k) site evaluation criteria. As discussed earlier, orphaned UST sites were given precedence over abandoned UST sites. The SSS is designed to provide a consistent scoring system regardless of the staff member completing the form. Each listed criteria has an assigned specific point value. The SSS Calculation Sheet Template is provided in Appendix C, for reference.

The SPL was created based on data collected and analyzed during this investigation and was used to rank the identified sites. The SPL is provided as Index A, Identified Sites sorted by Ranking. As discussed earlier, the priority ranking of the sites was based on a number of site specific and environmental factors. Two other indices are provided for reference: 1) Index B, Identified Sites sorted (alphabetically) by Site Name; and 2) Index C, Identified Sites sorted (alphabetically) by County. Each Index lists Site ID, Site name, Site county, and Site ranking (based on Site score).

Site Summary Documents, provided in Appendix D, were prepared to summarize each site individually. Each Site Summary Document contains the following information: Site Overview, with Site Score (Environmental Importance); Regional Site Map; Site Location Map; Site Photo Log; Field Reconnaissance Forms; and Relevant Additional Documents. The Site Overview sheet for each identified site details the following information: Site name, Site classification, environmental ranking, Site address, Owner name, and photo.

4.3.10 Final Site Mapping

Collected geospatial data were used to produce one statewide map: Nevada – Identified Sites, which illustrates the number and location of newly identified sites not within the existing NDEP UST database. A total of 182 sites were identified during this investigation. The identified sites include properties with the following scenarios: 1) properties with potential USTs present; 2) properties reported (but not confirmed) to have had USTs removed in the past; and 3) properties with unknown UST status. The statewide map is provided as Figure 5.

Regional site map base layers were produced using *National Geographic TOPO! 1:100,000 and 1:24,000-scale maps* as provided by *ESRI's ArcGIS online server*. Each map depicts one or more identified sites. The identified sites are labeled with a unique site number along with latitude and longitude coordinates. Regional site maps are provided in Appendix D, within each Site Summary Document.

Site location map base layers were produced using *World Imagery* as provided by *ESRI's ArcGIS online server*. Site location maps were produced for each identified site which may potentially contain orphaned or abandoned UST(s). The site location maps depict the potential UST site location and surrounding area. Site location maps are provided in Appendix D within each Site Summary Document.

4.4 PHASE I RESULTS

As previously indicated, 182 potential orphaned and/or abandoned UST sites were discovered/identified across the state of Nevada during this Phase I investigation. Identified sites were reported in 15 of the 17 counties within the state. The two counties where sites were not observed are Douglas and Storey. Criteria used to calculate site scores included the following:

- Land Use
- Ownership Status
- Distance to Surface Water
- Dominant Soil Type

- Distance to Archaeological Site
- Depth to Ground Water
- Distance to Irrigation or Drinking Water Well(s)
- Distance to Endangered Species (wildlife habitat and plant species)
- Annual Precipitation

A breakdown of criteria point values is shown on the SSS Calculation Sheet Template, provided in Appendix C. The highest site score calculated during this Phase I investigation was 6.50 for Cathy Service Station located in Washoe County. The lowest site score calculated during this Phase I investigation was 2.35 for Frenchman Station located in Churchill County.

4.5 PHASE I SUMMARY, DISCUSSION & RECOMMENDATIONS

The objective of this investigation was to locate and address USTs (primarily orphaned) that were never properly closed. The work detailed herein is Phase I of this project (researching and locating orphaned and/or abandoned USTs). The created scoring system was utilized to tabulate identified sites on a SPL, which ranked sites to determine which sites may be given priority for detailed site-specific investigations (Phase II). Since no imminently dangerous sites were discovered during Phase I activities, the aforementioned SPL was used to guide Phase II activities. Identified sites have been sorted into three different formats: 1) by ranking of potential for environmental impact (1-182), provided in Index A; 2) sorted (alphabetically) by Site Name, provided in Index B; and 3) sorted (alphabetically) by county, provided in Index C.

Based upon Phase I investigation results and the identified 182 potential UST sites, it was recommended that the Phase II investigation proceed. The purpose of the Phase II investigation, discussed below, was to conduct more detailed diligence to determine if USTs were in fact present or to determine if they had been removed on each of the 182 identified sites.

5.0 PHASE II ACTIVITIES

5.1 PHASE II INTRODUCTION

Phase II activities were conducted during the period of August 2010, to May 2011. Work was based upon the NDEP approved August, 2010 *Work Plan for Locating Orphaned and/or Abandoned Underground Storage Tanks (USTs) within the State of Nevada (Work Plan)*. Objectives of Phase II were met by conducting three primary tasks: 1) Project Planning; 2) Project Execution; and 3) Project Reporting (Deliverables). Details of each task are provided below.

5.2 PHASE II PROJECT PLANNING

Tasks completed during Project Planning included: 1) staffing for conducting Phase II activities; 2) adaptation of previously developed site inventory database for integration of new data; and 3) development of documents for correspondence with property owners. Details for completed tasks are provided below.

5.2.1 Staffing

Organizational staffing structure for Phase II is depicted on Figure 6. Review of Figure 6 indicates that the Federal Environmental Protection Agency (EPA) and NDEP –BCA are the overall stakeholders and BAI is the retained primary contractor. BAI utilized an overall ARRA Program Manager (Mr. Douglas Guerrant), a project specific Project Manager (Eric M. Seitz), and a support staff of six professionals. For purposes of this investigation, the state of Nevada was divided into two regions, North and South. These regions, depicted on Figure 7, are subdivided as follows:

<u>North Region</u>	<u>South Region</u>
Carson City	Clark
Churchill	Esmeralda
Douglas	Lincoln
Elko	Mineral
Eureka	Nye
Humboldt	
Lander	
Lyon	
Pershing	
Storey	
Washoe	
White Pine	

For the purpose of database management, Mr. Justin Gerthoffer provided support from BAI's Reno office. Training was conducted in preparation for Project Execution. BAI staff were informed of their duties and provided with support material.

In order to conduct non-invasive site-specific subsurface evaluations, the services of Zonge International, Inc. (Zonge), a geophysical subcontractor located in Lakewood, CO were utilized within in both project regions. Zonge provided field personnel and equipment for the analysis of seven sites identified as potentially having undocumented USTs.

5.2.2 Database Adaptation

At the request of NDEP, the current Access database was upgraded to Access 2010 format. Forms for new data entry were developed and implemented. Both Mr. Seitz and Mr. Gerthoffer were responsible for the refinement and ongoing changes to the site database.

5.2.3 Development of Correspondence and Investigation Documents

Phase II activities involved multiple attempts at formal correspondence with property owners. Email and letter templates were developed and utilized. For this investigation, BAI staff also developed: 1) an Access Agreement; 2) a Phone Call Form; 3) a Phone Call Script; 4) a Site Visit Form and; 5)

Talking Points for telephone conversations. These documents are included in Appendix E, Correspondence and Investigation Documents.

5.3 PHASE II PROJECT EXECUTION

To execute Phase II of this investigation, BAI staff utilized a 10 step Site Review Process (SRP). This process was approved by NDEP in the Phase II Work Plan, dated October 7th, 2010. The SRP is presented in Appendix F. Details for each step, are provided below.

5.3.1 Initial Investigation – SRP Step 1

Initial investigation efforts began with selection of an assigned site and review of available ownership data. Ownership data was researched and updated on an as needed basis. Once correct site address information was confirmed, Field Representatives commenced with initial mailings and phone calls to property owners. Contact results varied considerably, and many property owners were non-responsive.

5.3.2 Site Classification – SRP Step 2

Project personnel classified sites in order to identify appropriate next actions. Sites were classified as either: 1) site needs continued investigation; 2) site requires a field visit; or 3) documentation was received confirming that USTs either were removed from site, or were non-existent.

During SRP Step 1, it became evident that many of the sites identified in Phase I possessed or previously possessed USTs that were taken out of service prior to EPA enactment of UST compliance regulations, November 9, 1984. Consequently, research efforts by BAI staff and cooperative property owners resulted in many sites being classified as Pre-Regulation sites. Additionally, per the Safe Drinking Water Act of 1974, USTs determined to have been taken out of service prior to January 1, 1974 were cleared of undocumented UST obligations, as reporting is not required.

USTs determined to have been decommissioned, or taken out of service prior to November of 1984, but after January, 1974, have been classified as pre-regulation sites. Information for these sites is provided in the Phase investigation database.

5.3.3 Continued Investigation – SRP Step 3

If during the Site Classification process (SRP Step 2), project personnel were unable to properly classify a site, additional investigation was undertaken, as defined in the SRP. Additional office work was conducted, in attempt to resolve the challenge of non-responsive property owners. Staff conducted additional site visits, relied upon assistance of NDEP personnel, and utilized certified, return receipt requested postal services, in further attempt to gain a response from property owners.

5.3.4 Preparation for Site Visit – SRP Step 4

Careful preparation was undertaken prior to site visits. Field personnel coordinated their schedules with property owners and local officials in order to assure optimal use of field time. Field personnel targeted all sites within specific geographic areas, prior to travel. Field personnel obtained and carried site documents and maps in order to assure efficient use of field time.

5.3.5 Site Visit – SRP Step 5

The purpose of Phase II site visits was to verify presence or absence of USTs. Phase II site visits were conducted by BAI staff. During these visits, BAI staff performed visual inspections of sites and interviewed property owners and local officials.

As this Phase II Step 5 investigation proceeded, particular care was taken to understand historical data of individual sites. Understanding the history of a site facilitated project personnel making informed decisions as to whether ARRA funds could be utilized for additional site work. As indicated in Step 2, if historical data indicated that USTs had not been in service since prior to November 1, 1984 then the site was re-classified as pre-regulation.

Sites determined to fall under EPA regulations and suspected of containing USTs were considered for subsurface geophysical survey work, conducted by Zonge Inc. During Phase II of this investigation, Zonge Inc. was contracted to perform Magnetometer surveys on eight sites across the state of Nevada. Access Agreements allowing for conduct of these magnetometer surveys were pursued and secured, prior to scheduling these field activities.

During these initial Phase II Step 5 site visits/assessments, careful attention was taken to determine if a given site should be classified as a potentially impacted site. An impacted site is one that represents potentially imminent danger to human health and/or the environment. To date, during this investigation, no Impacted Sites have been discovered. As such, there has been no call to action, for use of the High Priority UST Taskforce. This task force consisted of BAI personnel capable of managing immediate threats from impacted sites.

5.3.6 Visit Review and Additional Work – SRP Step 6

Upon completion of field activities, field personnel conducted a debriefing of findings with the Regional Manager. Field documents were then submitted to the Project Manager for review and incorporation into the Site Database. A plan of action was then developed for each site that required further assessment.

5.3.7 Urgent Calls to Action – SRP Step 7

At the close of Phase II, no urgent calls to action had been required, as no Impacted Sites were identified.

5.3.8 Remove Site from Database – SRP Step 8

In the event that BAI staff discovered a site that did not contain USTs, or confirmed that the sites former USTs had not been in operation since prior to January 1, 1974, the site was removed from the database.

During Phase II, this process was refined. Sites found clear of undocumented UST obligations were not removed from the project database. These sites were classified as clear of UST obligations and site information remains in the project database.

5.3.9 Database Update and Site Rescoring – SRP Step 9

During Phase II, the Data Storage System (developed in Phase I of this investigation) was continuously updated and modified to accommodate newly gathered information. This resulted in generation of a new priority list of sites, ranked in order of potential for environmental impact. The site ranking was determined by utilizing the Site Scoring System developed in Phase I of this investigation.

5.3.10 Closure – SRP Step 10

The final objective of the SRP was to classify each site into one of three categories: a) 1) No USTs present; 2) Orphaned USTs present; or 3) Abandoned USTs present. During this overall Phase II investigation, it was determined that these classifications were restrictive, and that they should be expanded. Accordingly, additional classifications were created, as described below.

5.4 PHASE II DELIVERABLES

The primary Phase II investigation deliverable is the report provided herein and updated database. Provided within this report is the description of conducted activities (provided above), a series of tables detailing investigation data (discussed below), Site Summary Documents (Appendix D), site maps for three sites recommended for subsurface site assessment (Figure 8 – Beatty Airport, Figure 9 – Old West Gas Station and Figure 10 – S & S Rentals) and geophysical subcontractor, Zonge International, Inc. Results and Reports (Appendix G).

Compiled data are tabulated into eight tables, as follows:

Table 2: Pre-regulation UST(s): cleared of undocumented UST obligations

Table 3: No UST(s) identified: cleared of undocumented UST obligations

Table 4: UST(s) previously identified by NDEP: cleared of undocumented UST obligations

Table 5: Owner non-responsive, referred to NDEP: not cleared of UST obligations

Table 6: Investigation open, referred to NDEP: not cleared of UST obligations

All tables list sites in order of rank based upon potential for environmental impact. During Phase II activities, three sites were identified for subsurface assessment: Beatty Airport (Figure 8), The Old West Gas Station (Figure 9), and S & S Rentals (Figure 10).

5.5 PHASE II RESULTS

Phase II investigation activities resulted in a refinement of the 182 sites identified during Phase I. In many cases, extensive correspondence and interaction with property owners transpired during Phase II. Stakeholders were provided multiple opportunities to correspond with investigation personnel, assuring property owners the ability to become informed about this investigation, their responsibilities as site owners, and available methods of resolution to potential UST obligations.

Both orphaned and abandoned (previously undocumented) USTs were discovered during this investigation, in addition to discovery of numerous documented and/or non-regulated USTs. Sites possessing orphaned USTs were given priority over sites possessing abandoned USTs.

Sites determined to be “previously documented” (i.e., sites already having been issued an NDEP facility ID number) were removed from the final list/site database. Additionally, sites determined to be non-regulated, with no reporting requirements, were also removed from the final list/site database. No sites representing an imminent hazard to human health and/or the environment were identified/discovered during Phase II activities

General Phase II investigation results are as follows:

- 119 sites were cleared of obligations regarding USTs.
- 30 site owners were non-responsive or not findable with available information
- 30 sites required additional investigation
- Three sites were identified for subsurface assessment

5.6 PHASE II DISCUSSION & CONCLUSIONS

Phases I and II of this investigation have been exhaustive and challenging. Initially, 182 sites were identified as potentially possessing a UST that might be considered orphaned or abandoned. Further investigation eliminated 119 of these sites from the list of potential sites, for various reasons. Finding property owners and then gaining their cooperation proved to be difficult in general, and unsuccessful for approximately 30 sites. Additionally, a number of sites were found to be held in various County trusts across the state, some of which are likely locations of additional undocumented USTs. With additional investigation work, the possibility of correctly classifying and assessing these properties was considered high. County governments were hesitant to allow access to sites, as they were concerned about financial burdens that they may incur, should remediation of sites become necessary. Properties in trust are auctioned to the public, “as is”. As such, County governments have been advised by their respective district attorneys not to grant this investigation team access to these properties.

At the close of Phase II activities, BAI staff was continuing to pursue Access Agreements for numerous sites. These Access Agreements are required to further investigate sites that have a higher probability of containing undocumented USTs. These sites were also targeted for their potentially higher risk of environmental impact. At the close of Phase II, these sites were included in the classification of “Sites requiring further investigation - recommended for additional investigation”. As such, they were subject to further investigation during Phase III activities, discussed below.

General observations noted during Phase II activities include that in the 1970s, 80s and 90s, the practice of removing USTs without assessment and/or remediation and the practice of in-place UST

closures, were widespread. Additionally, many tanks were removed and relocated by property owners, to be used in agriculture and ranching operations elsewhere. Furthermore, it was not uncommon for older cities, along major highway corridors, to have had multiple fueling stations within several city blocks of one another. The earlier of these establishments utilized a variety of above ground tank styles, as well as USTs. Many facilities used small, portable ASTs that were gathered and filled at sites remote to point of sale/use. These small ASTs were common at hotels, pharmacies, and small auto repair business throughout the state of Nevada.

5.7 PHASE II RECOMMENDATIONS

There are three primary recommendations for the Phase III portion of this investigation: 1) Continue to research remaining unclassified sites; 2) conduct additional geophysical site investigations once Access Agreements are approved by property owners; and 3) conduct site-specific subsurface assessments. Details relative to each recommendation are provided below. At the close of Phase II, there were approximately 60 sites that, for various reasons, had not been assigned a final classification. In order to complete this investigation, these sites need to be further investigated.

6.0 PHASE III ACTIVITIES

6.1 PHASE III INTRODUCTION

Phase III activities were conducted during the period of July 2010 to March 2011. Work was based upon the NDEP approved April 25, 2011 *Work Plan for Locating Orphaned and/or Abandoned Underground Storage Tanks (USTs) within the State of Nevada (Work Plan)*.

During Phase II of this investigation (discussed above), extensive correspondence and interaction with property owners resulted in a refining of the Phase I list of the 182 sites. Additionally during Phase II activities, it was discovered that a majority of these 182 sites had not been operated for many decades, thus qualifying them as non-regulated sites per State and Federal law. Consequently, owners of these sites were cleared of obligations relative to previously undocumented USTs.

Subsurface magnetometer surveys were conducted on 12 sites across the state as part of Phase II activities. The objective of these surveys was to further investigate the possible presence of USTs on these identified sites. Sites where magnetic surveys were observed present (three) were given priority for further assessment activities during Phase III activities (discussed below).

6.2 PHASE III PLANNING

Phase III Project Planning tasks included: 1) Staffing; 2) Geographic organization; and 3) database adaptation. Each task is discussed in detail below.

6.2.1 Staffing

Phase III staffing included existing personnel familiar with the investigation and type of work to be performed. The staff was selected and briefed on the Phase III scope of work. Phase III organizational structure is depicted on Figure 11, with BAI retained as the primary contractor reporting to NDEP.

BAI's team included an ARRA Program Manager (Mr. Douglas Guerrant), a Project Manager (Eric M. Seitz), and support staff of five additional professionals. Additionally, utility-locating subcontractors, certified tank handlers, excavation contractors, environmental services companies, and drilling contractors were utilized during Phase III activities.

6.2.2 Geographic Organization

During Phase II of this investigation, two new geographic regions were established. For Phase III, no changes were made to this approach.

6.2.3 Database Adaptation

The database developed and utilized during Phases II and III was adapted and refined for continued use. Per NDEP request, the existing database was updated to Microsoft Access 2010 format. Mr. Justin Gerthoffer was responsible for maintenance and continued development of the database. Mr. Gerthoffer also participated in the administration of the project GIS.

6.3 PHASE III PROJECT EXECUTION

There were three tasks undertaken during project execution: 1) Continued investigation work; 2) assessment of priority sites; and 3) characterization of priority sites, as needed.

6.3.1 Continued Investigation

During Phase III activities, approximately 60 sites, not classified during previous phases, were further investigated. BAI personnel had been successful in utilizing local government agencies as a resource to obtain ownership information, historical land use information, accurate locations of suspect sites, and geographical location of sites. Based upon this previous experience, the practice of engaging local government agencies was continued, as final classification of the 182 sites was pursued. Additionally, BAI pursued and obtained Access Agreements with site owners. Upon execution of these Access Agreements, BAI personnel arranged for field visits, and in two additional cases, arranged for conduct of subsurface magnetometer surveys (conducted by Zonge).

As new information was obtained and/or developed, the project database was updated. Where no new information could be developed for yet to be unclassified sites, those sites were classified as non-cooperative.

6.3.2 Site Assessment

Site assessment work was undertaken at three priority sites, along with an additional priority site, discovered during continued Phase III investigation activities, for a total of four sites. These sites were as follows:

- Former Old West Gas Station, Wells, NV
- Former S & S Rentals, Winnemucca, NV
- The Beatty Airport, Beatty, NV
- Frenchman's Station, Churchill County, NV

As one of the goals of this investigation was to not burden property owners with liabilities related to potential environmental regulation of sites, it was decided that both the Old West Gas Station and Beatty Airport sites undergo a formal records review. This was executed in the form of an ASTM 1527-05 AAI Phase I Environmental Site Assessment. This step was taken as an effort to provide property owners with eligibility for Nevada State Brownfields grant funding or financing, should it be necessary.

Site assessment field activities were conducted at all four sites in an effort to locate the suspected USTs for each site and to collect tank and line closure assessment soil samples for each located UST. In the event that impacts were discovered during tank closure assessment activities, site characterization activities and, if necessary, mitigation measures were authorized by NDEP in order to fully evaluate overall site conditions. Authorized options to be considered for additional assessment and/or characterization included: over-excavation; test pits; soil borings via drilling (direct push or conventional drilling technique); groundwater monitor well installation; and/or a combination of these techniques. Additionally, if it was determined that the USTs and/or lines were in the way of conducting assessment activities, then removal of this infrastructure was approved by NDEP to facilitate complete assessment.

As indicated above, a total of four sites were assessed. Summary details for activities conducted at each site are provided below.

6.3.2.1 FORMER OLD WEST GAS STATION, WELLS, NV – SUMMARY OF ACTIVITIES

Results of initial field observations suggested the presence of multiple USTs at the Former Old West Gas facility located at 411 & 455 6th Street in Wells, NV. Accordingly, this site was selected for detailed site assessment activities. L.A. Perks Plumbing & Heating (Perks), a Nevada Licensed Tank Handler, was contracted to conduct exploratory excavation and, if necessary, tank removal activities. A total of five USTs were located in three excavation areas: two 10,000 gallon capacity gasoline USTs and one 12,000 gallon capacity diesel UST in Pit 1; one approximate 700 gallon capacity waste oil UST in Pit 2; and one 500 gallon capacity heating oil UST in Pit 3. Tank closure assessment soil sample analytical results indicated the presence of impacted soil in all three tank locations.

Based upon the above results and with NDEP approval, limited vertical and lateral over-excavation activities were conducted in an attempt to define the extent of impact in each area. Unfortunately, the presence of the USTs was inhibiting this effort. Therefore, and with NDEP approval, the USTs were removed, in accordance with standard tank removal protocol, and additional limited over-excavation and sampling activities were conducted. Soil sample analytical results for these additional samples indicated that most of the impacted soil had been removed but that some impacts remained in place and the potential for impacts to groundwater was observed. Accordingly, and with NDEP approval, site characterization activities were conducted in the form of installation of five groundwater monitor wells. The wells were drilled and constructed by HazTech Drilling (HazTech), a Nevada

Licensed Driller located in Meridian, ID utilizing a hollow stem auger rig. Soil and groundwater sample analytical results for these borings/wells were below State Action Levels for constituents of concern.

Given the above results and the fact that some soil impacts were left in place, a risk assessment/evaluation was conducted via protocol provided in NAC 445A.227 2.0 (a-k). Results of this risk assessment, combined with the fact that remaining impacts appear to be limited to the site, suggest that remaining impacts do not represent an immediate or significant threat to human health and/or the environment. As such, site closure was recommended to NDEP for this site.

For more specific details relative to this site, the reader is referred to Appendix H for a complete Site Assessment Report.

6.3.2.2 FORMER S & S RENTALS, WINNEMUCCA, NV – SUMMARY OF ACTIVITIES

Results of initial field observations, interviews with the property owner, and conduct of a magnetometer survey suggested the presence of USTs at the Former S & S Rentals facility located at 5475 E. Winnemucca Blvd., Winnemucca, NV. Accordingly, the site was selected for detailed site assessment activities. Bramco Construction (Bramco), a Nevada Licensed Tank Handler, was contracted to conduct exploratory excavation, and if necessary, tank removal activities.

Exploratory excavation activities began on-site at the location of two visible steel manhole covers located near the edge of the cement slab located southeast of the former onsite pump island. Trenching around the two steel covers revealed that the bottom of the trench was filled in with concrete. It was subsequently concluded that the two steel covers were sign posts for the former gas station at the site and not related to any USTs.

Trenching activities were continued along the western side of the fuel islands and building. Excavated trenches were approximately two feet wide and to a depth of eight feet bgs. While trenching along the western side of the building, a septic system was accidentally uncovered. The septic system was marked and was not disturbed. While trenching on the eastern side of the building, product lines were uncovered. No holes, cracks, or hydrocarbon staining were observed to be present upon inspection of the product lines. However, a hydrocarbon odor was noted an area where the product line had previously been cut and capped. The photoionization detector (PID) detected readings of 38.7 ppm inside the pipe and 0.5 ppm within the soil.

Based upon the above information, the product lines were removed with a backhoe and over-excavation of the soil along the pathway of the product lines was conducted on June 21, 2011. The trench was approximately 65 feet long by three feet wide and to a depth of approximately five feet bgs. Soil samples were then collected laterally at one foot, 35 feet, and 50 feet along the bottom of the excavated trench. Collected soil samples were analyzed for TPH-ORO, DRO and GRO via EPA Method 8015 modified.

Soil sample laboratory analytical results demonstrated minimal detections in insufficient amounts quantity to trigger a release reporting requirement. All excavations were backfilled and compacted. The soil surrounding the discovered supply line was disposed of, off site, at a local waste facility. The discovered supply line was also removed and disposed of, at the local waste facility. The site is considered closed and free of any undocumented UST obligations.

The complete Site Assessment Report for this site is included as Appendix I.

6.3.2.3 *THE BEATTY AIRPORT, BEATTY, NV – SUMMARY OF ACTIVITIES*

Results of initial field observations, interviews with the property owner, and conduct of a magnetometer survey suggested the presence of USTs at the Beatty Airport, Beatty, NV. Accordingly, the site was selected for detailed site assessment activities. Nye County, the owner of the property, was contracted to conduct exploratory excavation.

Initial field excavation activities were conducted on July 12, 2011 when the UST was located almost immediately. The tank was cylindrical and had dimensions of approximately 30 feet in length and eight feet in diameter, with an approximate capacity of 12,000 gallons. The top of the tank was discovered at an approximate depth of six feet below ground surface (bgs). A fill cap was exposed and removed from the tank and liquid product was observed to be present inside the tank. Accordingly, excavation activities were ceased until the tank contents could be removed and site working conditions rendered to be safe. High Desert Petroleum (HDP) was contracted to remove the tank contents and to perform tank evacuation procedures necessary to provide safe working conditions. After approximately four hours of pumping on July 13, 2011, it was discovered that the quantity of liquid in the tank could not be removed and/or stored with the onsite equipment. HDP returned to the site on July 14, 2011 with a pump truck and removed what appeared to be the remaining tank contents (approximately 200 gallons). HDP then began evacuating vapors to remove a potentially explosive environment, as at this point, there did not appear to be any product remaining in the tank. However, the vapor concentrations would not subside. Upon further examination, it was determined that the tank was sloped in the direction of the dispenser island and in fact all of the contents had not been removed.

Nye County and HDP returned to the site on July 19, 2011 to carefully excavate/expose the other end of the tank and gauge the contents remaining in the tank (estimated at approximately 150 gallons). On July 21, 2011, HDP removed the remaining contents. The tank was then triple rinsed with 80 gallons of water which was then pumped out of the tank. A Lower Explosive Limit (LEL) meter was used around the tank to determine if there was hazard for fire or explosion, of which none was found. Tank closure assessment samples were then collected from both ends of the UST and submitted to Veritas Laboratories (Veritas) (Henderson, Nevada) for analysis of Total Petroleum Hydrocarbons extractable (TPH-E) diesel range organics (DRO) and oil range organics (ORO) by EPA Method 8015M, as well as Total Petroleum Hydrocarbons purgeable (TPH-P) gasoline range organics (GRO) by EPA Method 8015M.

Soil sample laboratory analytical results were non-detect for DRO, ORO, and GRO. The site was secured with fencing by Nye County and the tank was left in place for Nye County to address.

The site is considered closed and free of any undocumented UST obligations. The complete Site Assessment Report for this site is included as Appendix J.

6.3.2.4 *FRENCHMAN'S STATION, CHURCHILL COUNTY, NV – SUMMARY OF ACTIVITIES*

Results of initial field observations, interviews with the property owner, and conduct of a magnetometer survey suggested the presence of three possible USTs present at the former Frenchmen's Station facility, Churchill County, Nevada. The property is owned by the United States Navy – Fallon Naval Air Station (NAS) with a Nevada Department of Transportation (NDOT) right of way easement. Given the possible presence of USTs, the site was selected for detailed site assessment activities. H₂O Environmental (H₂O)(Reno, NV), was contracted to perform exploratory excavation work at the site.

Exploratory excavation activities were conducted on August 16, 2011 in three areas (A, B, and C) in an attempt to locate suspected USTs. One UST was located with 12 feet long and three feet wide dimensions (approximately 700 gallons). The top of the tank was discovered at an approximate depth of two feet below ground surface (bgs). The tank appeared to be visibly damaged and aged, and it was found to be empty. A photoionization detector (PID) was used to check for the presence of volatile organic compounds (VOCs), but none were found to be present. Two tank closure assessment samples were collected, one from each end of the tank. Collected samples were submitted Alpha Analytical, Inc. (Alpha) (Sparks, NV) for analysis of Total Petroleum Hydrocarbons extractable (TPH-E) diesel range organics (DRO) and oil range organics (ORO) by EPA Method SW8015B, as well as Total Petroleum Hydrocarbons purgeable (TPH-P) gasoline range organics (GRO) by EPA Method SW8015B.

Soil sample laboratory analytical results were non-detect for DRO, ORO, and GRO. Accordingly, the soil sample collection excavation areas were backfilled and compacted. Both the NAS and NDOT were notified of findings at the Frenchman Station site. The site is considered closed and free of any undocumented UST obligations.

The complete Site Assessment Report for this site is included as Appendix K.

6.4 PHASE III SUMMARY

The objective of Phase III was to correctly classify sites identified during Phases I and II of this investigation, and to conduct tank and line closure activities for four sites identified to potentially possess orphaned and/or abandoned USTs. At the conclusion of Phase III activities, all 182 originally identified sites were assigned one of the following classifications:

- Pre-regulation UST(s): cleared of undocumented UST obligations
- No UST(s) identified: cleared of undocumented UST obligations
- UST(s) previously identified by NDEP: cleared of undocumented UST obligations
- Owner non-responsive, referred to NDEP: not cleared of undocumented UST obligations
- Investigation open, referred to NDEP: not cleared of undocumented UST obligations

Each of the four identified sites to potentially possess USTs were investigated, three of which were found to possess USTs. Those discovered USTs were subjected to tank closure assessment activities, one of which was found to have impacts (Old West Station, Wells, NV). Additional site characterization and mitigation activities in conjunction with conduct of a risk based evaluation of remaining impacts on the Old West Station site resulted in a recommendation for site closure.

7.0 OVERALL INVESTIGATION SUMMARY & RESULTS

Broadbent & Associates, Inc. was contracted by the State of Nevada to locate, inventory, and prioritize for environmental assessment, orphaned and/or abandoned underground storage tanks (USTs) within the state of Nevada. Activities were conducted as part of the Leaking Underground Storage Tank Trust Fund Assistance Award, funded under the American Reinvestment & Recovery Act (ARRA) of 2009. The objective of this investigation was three-fold: 1) Review available resources in an effort to locate and build an inventory of orphaned and/or abandoned UST sites within the state of Nevada that, at the time they were taken out of service, were not properly assessed and/or closed (Phase I); 2) refine the

Phase II inventory list by conducting more detailed field investigations (Phase II); and 3) correctly classify sites identified during Phases I and II and conduct tank closure assessment activities on identified sites that were suspected to contain orphaned and/or abandoned USTs that potentially represent a hazard to human health and/or the environment (Phase III).

A total of 182 potentially orphaned and/or abandoned UST sites were identified during Phase I via an exhaustive research and field reconnaissance effort. Information for each site was entered into a Microsoft Access database and integrated into a personal Geodatabase. Site location and scoring activities were conducted using a detailed Geographic Information System (GIS). A designed Site Scoring System (SSS) was then utilized to create a total site score for each identified site, in order to determine potential for impact to human health and/or the environment. Scored sites were then ranked from highest priority to lowest priority (1 through 182). Identified sites were sorted into three different formats: 1) Potential for environmental impact (1-182); 2) Site Name; and 3) County.

During Phase II, extensive correspondence and interaction with property owners resulted in a refined list of the 182 sites. Both orphaned and abandoned USTs were discovered, in addition to discovery of numerous documented and/or non-regulated USTs. Sites determined to be “previously documented” (i.e., sites already having been issued an NDEP facility ID number) were cleared of obligations relative to this investigation. Additionally, sites determined to possess non-regulated USTs, with no reporting requirements applicable, were also cleared of obligations relative to this investigation. At the conclusion of Phase II: 119 sites had been cleared of obligations relative to this investigation; 30 site owners were non-responsive or not findable with available information; 30 sites required additional investigation; and three sites had been identified for subsurface assessment.

Phase III activities were conducted to correctly classify sites identified during Phase I and II, and to conduct tank and line closure activities for sites identified to potentially possess orphaned and/or abandoned USTs. At the conclusion of Phase III activities, all 182 originally identified sites were assigned one of the following classifications:

- Pre-regulation UST(s): cleared of undocumented UST obligations
- No UST(s) present: cleared of undocumented UST obligations
- UST(s) previously identified by NDEP: cleared of undocumented UST obligations
- Owner non-responsive, referred to NDEP: not cleared of undocumented UST obligations
- Investigation open, referred to NDEP: not cleared of undocumented UST obligations

Additionally, a total four identified sites (three from Phase II and one from Phase III) received a detailed field investigation during Phase III, three of which were found to possess USTs. Those discovered USTs were subjected to tank closure assessment activities, one of which was found to have impacts (Old West Station, Wells, NV). Additional site characterization and mitigation activities, in conjunction with conduct of a risk based evaluation of remaining impacts, resulted in a recommendation for site closure for the Old West Station site.

Overall investigation results include:

- 182 sites identified
- 147 sites eventually cleared of obligations relative to this investigation
- 35 sites remain in question and were referred to NDEP for further consideration
- Four sites were subject to detailed field assessment, three of which were found to possess USTs, but only one of which was found to have had a release (Old West Station, Wells, NV)
- Old West Station was recommended for case closure through site investigation and risk based assessment procedures

8.0 DISCUSSION & CONCLUSIONS

This project set out to conduct a statewide search for USTs that might not have been properly closed, prior to the onset of modern UST regulations. The project was funded by federal stimulus monies, provided by the American Reinvestment & Recovery Act (ARRA). As such, project objectives were to provide a service to the State of Nevada, in terms of searching for potential environmental liabilities, while also stimulating the economy and creating jobs in local communities across the state, even if these jobs were short term. These objectives were achieved. A total of 182 sites were identified as possible liabilities. 15 short term positions were created and one long term position was filled. Additionally, an extensive project database was generated. This database will be utilized by NDEP as a useful tool, when questions arise about any of the identified properties. Of the 182 identified sites, after extensive due diligence efforts, field assessment activities were conducted on four sites. There are 37 sites that still require additional investigation.

As a result of this investigation, the State of Nevada should feel confident that, statewide, there is little probability of unknown environmental liabilities associated with orphaned and/or abandoned USTs.

9.0 CLOSURE

Our services were performed in accordance with generally accepted practice, at the time work was performed. Results and recommendations were based on review of available documentation and written or verbal correspondence with regulatory agencies, laboratory results, observations of field personnel, and the sites investigated. No warranty is expressed or implied.