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January 6, 2010

U.S. Army Corps of Engineers, Albuquerque District
ATTN: CESPA-EC-G (Mr. Brian Jordan)
4101 Jefferson Plaza NE
Albuquerque, NM 87109
505-228-9275

Subject: Contract W912DY-04-D-0005, Delivery Order 0009
MMRP SI for SW IMA Region - Advance TPP Packet
Former Los Alamos Demolition Range

Dear Mr. Jordan:

Parsons has prepared an Advance Packet for our Technical Project Planning (TPP) Meeting for the former Los Alamos Demolition Range. This meeting is scheduled for February 2, 2010 in Santa Fe, New Mexico at the New Mexico Environment Department (NMED) office. Four additional copies have been provided for your distribution to other key project stakeholders (NMED, LANL, DOE). Preparation and submittal of this packet is not required by the project's Performance Work Statement, however, Parsons believes that the intrinsic value will yield substantial dividends by providing the TPP attendees with an opportunity to familiarize themselves with site background and our (the Project Team) proposed Site Inspection technical approach prior to our presentation and justification at the TPP meeting. In this manner, the likelihood of a productive TPP meeting resulting in active participation and concurrence (or alternate idea discussion) is dramatically increased.

Upon your approval Parsons will prepare additional copies for your distribution. If you have any questions or comments, please contact me at (303) 764-1927 or (720) 480-6760 (cell).

Sincerely,

Parsons

Greg Van
MMRP SI Task Manager

cc: Laura Kelley (Parsons)
Project File (744653.85123)

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U.S. Army Corps of Engineers
Southwest IMA Region

Advance Information Packet

Former Los Alamos Demolition Range

Los Alamos County, New Mexico

FUDS Project No. K06NM004201

In Support of

Technical Project Planning Meeting

FUDS MMRP Site Inspections Project

Prepared by:

PARSONS

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Norcross, Georgia 30092

Prepared for:

U.S. Army Corps of Engineers, Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109

and

SPD Range Support Center

Contract: W912DY-04-D-0005
Task Order: 0009

Date: January 6, 2010

TPP Team Member

Subject: Technical Project Planning (TPP) Packet

The attached documents are provided for your review prior to the Site Inspection (SI) TPP meeting. The items contained in the packet will be discussed over the course of the day and are relevant to obtaining project team consensus on the SI approach to be implemented as part of the U.S. Army Corps of Engineers (USACE) Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) Military Munitions Response Program (MMRP) process.

Providing this TPP packet affords TPP attendees the opportunity to prepare questions and comments for discussion at the meeting.

Your participation in the TPP process is essential to the successful completion of the Site Inspection phase of the MMRP, which will ultimately lead to decisions regarding response actions and site closure. Your advance review of these documents will help focus the meeting and ensure the appropriate site actions are taken.

We look forward to seeing you at the meeting and are available in the interim for any questions you may have concerning the documents.

GENERAL OVERALL SI TECHNICAL APPROACH – SOUTHWEST

The text presented below was excerpted and modified from Parsons' proposal to conduct Site Inspections submitted to USAESCH in April 2005 and provides a general understanding of our planned Technical Approach to Site Inspection. Procedural details are presented in the Programmatic Work Plan and augmented by the Site Specific Work Plan (to be prepared following completion of the Technical Project Planning process for each individual site).

UNDERSTANDING OF THE REQUIREMENTS

The primary objective and purpose for this Site Inspection (SI) project is to ensure existing sites within the Formerly Used Defense Site (FUDS) inventory are sufficiently evaluated to comply with Engineer Regulation (ER) 200-3-1 SI requirements and to collect sufficient data to determine whether individual project sites warrant further response action or can proceed to a no Department of Defense (DoD) action indicated (NDAI) status. The requirements of this project will be met when the following objectives have been satisfied:

- The Technical Project Planning (TPP) process has been initiated for each individual site to include determination of the necessary data to develop Data Quality Objectives (DQOs), develop the initial Conceptual Site Model (CSM), execute the field work, and satisfy SI close-out requirements.
- A Site Visit (Field Reconnaissance and Munitions Constituent Sampling) is conducted to augment the data collected during the Preliminary Assessment (PA) and to gather additional historical and site-specific data to confirm data needs and the nature and scope of the SI, as required by ER 200-3-1 paragraph 4-4.1.2.1.
- Sufficient data has been collected or developed for Hazard Ranking System (HRS) scoring by the United States Environmental Protection Agency (USEPA).
- Sufficient data has been collected to complete the Munitions Response Site Prioritization Protocol (MRSPP).

OVERALL TECHNICAL APPROACH

Upon comprehensive review of the existing data provided by the United States Army Corps of Engineers (USACE) and other supplemental sources, all sites can be grouped into one of three general categories. The significance of this determination aided development of the appropriate reconnaissance level and Munitions Constituent (MC) sampling strategy to meet the objectives of the SI. The three categories are:

- Category 1 Sites – Anticipated No Department of Defense Action Indicated (NDAI)
- Category 2 Sites – Anticipated Remedial Investigations and Feasibility Studies (RI/FS)
- Category 3 Sites – Sites for which a preliminary determination of the next course of action (NDAI or RI/FS) is not readily apparent.

Typically the characteristics displayed by **Category 1 – Anticipated NDAI** sites include one or more of the following qualities:

- Limited military use;
- Unsubstantiated munitions and explosives of concern (MEC) or unexploded ordnance (UXO) presence;
- Minimal or nonexistent component of risk to public health or the environment; or
- Lack of or suspect evidence to support historical training activities would leave a residual risk.

Obviously, the presence of confirmed UXO would preclude the site from further consideration for grouping in this category. However, the presence of confirmed "practice" munitions requires additional evaluation as to whether their presence is strictly confined to wholly inert items (without spotting charge or active fuzing).

The SI field approach has been formulated, to the extent possible, to reflect the anticipated outcome. The SI guidance states the minimum amount of information necessary should be collected as part of the SI to meet the project objectives. Further, "***The SI is not intended as a full-scale study of the nature and extent of contamination or explosives hazards***" per ER 200-3-1. That being said this project requires extensive coordination with regulators and other key stakeholders as part of the TPP process. The justification for an SI-level NDAI recommendation (followed by MEC/MC site closeout) is viable for some sites but requires sufficient sampling and groundtruthing to satisfy the Project Team's concerns. As such, a successful SI field approach for Category 1 sites must recognize this paradigm and be focused to yield a sufficiently compelling argument for an NDAI determination. To accomplish this objective the site field investigations for Category 1 sites are tailored to include expanded reconnaissance coverage as well as a defensible MC sampling strategy.

Parsons reviewed U.S. Environmental Protection Agency's (USEPA's) "Guidance on Choosing a Sampling Design…" (EPA/240/R-02/005) and other pertinent sampling guidance documents in an effort to identify a MC sampling strategy to adequately address the data needs for Category 1 sites. The basis for the strategy included the expectation that non-detect (or background) will be the 'typical' analytical result, that the variability will be low, and that a false-negative result is of greater concern than a false-positive. Parsons concluded that, in general, multi-incremental soil samples distributed throughout the site to achieve representative coverage would be sufficient for most sites. The assumptions inherent in developing this proposed sampling plan will be discussed and perhaps modified during the TPP process.

The second site type, **Category 2 – Anticipated RI/FS**, typically display one or more of the following characteristics:

- Confirmed discovery or presence of UXO;
- Documented injury of fatality incident on file attributable to UXO presence;
- Archive Search Report (ASR) designated Risk Assessment Code (RAC) score of 1 or 2;
- Prior post-ASR investigations, Time Critical Removal Action (TCRA), or other response actions; or
- Overwhelming evidence of former military usage or training that might pose a significant risk to public health or the environment.

Parsons anticipates that ***screening*** for MC presence (as opposed to delineation or characterization) is sufficient for Category 2 sites with bias toward high probability areas such as ranges, targets, and locations of prior MEC recoveries. As such, a representative template sampling design could not be developed for Category 2 sites and site-specific reconnaissance and MC sampling has been developed on a case-by-case basis using professional judgment.

Category 3 sites display attributes of both Category 1 and Category 2 sites. Similar to Category 2 sites, A representative template sampling design could not be developed for Category 3 sites. Furthermore, some Category 3 sites have sub-areas that require RI/FS but at the same time large land areas where no evidence of MEC or MC contamination is likely. Therefore, site-specific reconnaissance and MC sampling has been developed on a case-by-case basis using professional judgment.

PROJECT ORGANIZATION

Several organizations are directly involved in this Military Munitions Response Program (MMRP) SI project. Exhibit 1 identifies the key project reporting structure. The Project Team consists of the USACE geographic Design Center (South Pacific Division Range Support Center), Parsons, and includes six USACE Districts (comprising the Southwest geographic Design Center region). In addition, USEPA, state, and local regulatory agencies, as well as other key stakeholders will comprise individual site project teams. The roles of these team members are described below.

U. S. Army Corps of Engineers, Design Center

The U.S. Army Engineering and Support Center, Huntsville (CEHNC) provides program management as well as technical expertise support to the project. The CEHNC also has the mission to standardize the MMRP SI process. For the MMRP SI Southwest geographic Design Center region, Lara Beasley serves as the SI Program Manager for the USACE Design Center and will provide technical management and execute the project. The Design Center responsibilities include procurement of contractor services; review and coordination of project plans and documents; interaction with the news media and the public; and monitoring the project schedule for this performance-based FFP project.

U.S. Army Engineer Districts

Representatives from one of the six local USACE Districts within the South Pacific Division Range Support Center regions (depending on individual site jurisdiction) will participate on the Project Team and attend the applicable TPP meetings. Individual USACE District PMs are responsible for obtaining rights-of-entry (ROE), coordinating with regulators and other stakeholders, and working closely with the geographic Design Center assigned to execute the SI. Additional District responsibilities may include review of project plans and documents, working with the news media and the public, and coordinating with federal, state and local regulatory agencies on issues pertaining to implementation of this SI and protection of ecological and cultural resources. The specific USACE District will be identified in the Site Specific Work Plan (SS-WP).

Parsons

A Programmatic Work Plan (PWP) has been prepared which provides overall engineering support and services for implementation of the SI. Parsons is responsible for performance of the activities detailed in the PWP. Personnel performing work in support of this study will meet the qualifications required by Contract No. W912DY-04-D-0005, Section C, para. 5.0, Personnel Qualifications.

Other Subcontractors

Parsons has subcontracted laboratory services to ensure successful completion of the Delivery Order. Chemical analytical services on this project will be provided by Agriculture & Priority Pollutants Laboratories, Inc. (APPL), in accordance with the Programmatic Sampling and Analysis Plan (PSAP) and site-specific SAP (SS-SAP). Specifically, APPL will perform chemical analysis on samples collected from each of the sites and provide results to Parsons for validation. No other subcontractors are anticipated.

Federal, State, and Local Agencies

The roles of site-specific federal, state, and local agencies include active participation in the TPP process and review of project plans and documents.

PROJECT PERSONNEL

Parsons will utilize a highly experienced project team to support the FUDS SI project. Our key project personnel have each served in their proposed capacity on many other hazardous and toxic waste (HTW) and MEC CERCLA and NCP-related projects for USAESCH at FUDS and active and inactive installations. Personnel performing work in support of this MMRP project will meet the qualifications required by Section C, para. 5.0 of the basic contract. Parsons' project team consists of dedicated personnel to effectively manage this SI project. In addition, Parsons' depth of project resources ensures a sufficient number of project personnel remain available to manage multiple, concurrent SI taskings and any unforeseen surge capacity requirements. The SI team is familiar with USACE Districts and regulatory personnel within the Southwest USACE geographic Design Center region. All of Parsons' support personnel possess MEC work experience directly applicable to this project.

Project Manager

The Parsons' PM, Mr. Don Silkebakken, will be the direct point-of-contact for USAESCH and the geographic MMRP Design Center. Mr. Silkebakken is a registered Professional Engineer with 15 years of government project experience addressing HTW and MEC contamination at FUDS. Mr. Silkebakken is responsible for managing all requirements of the project, overseeing the performance of all individuals on the SI project team, coordinating contract work, and overseeing specific task identification and resolutions. He will also schedule field efforts, identify the site personnel to accomplish the specific SI tasks as defined in the PWP and subsequent SS-WP, implement project QC and safety procedures, and direct personnel to achieve successful and timely completion of the project tasks. He will promptly implement approved and authorized changes to ongoing work orders, as necessary. Mr. Silkebakken will be assisted by the following key personnel.

Deputy Project Managers

To enhance communication and foster a stronger partnership between Parsons, regulators, and the MMRP USACE geographic Design Center the Parson's PM will rely on Deputy Project Managers (DPM) that will help expedite planning and project execution. Ms. Laura Kelley and Mr. Michael Short will serve in the capacity of DPM on the SI project under Mr. Don Silkebakken's direction. Both have years of government project experience and are savvy with regards to addressing HTW and MEC contamination at FUDS. This team has a history of success working together on MEC projects, including major MEC programs for USAESCH under our DACA87-95-D0018 and DACA87-00-D0038

contracts. Ms. Kelley and Mr. Short will be responsible for the day to day implementation of the SI components and processes. Mr. Short's primary area of responsibility will be the Southwest USACE geographic Design Center region and Ms. Kelley's primary focus will be the Southeast and Pacific USACE geographic Design Center region. However, both will be familiar with and involved in all aspects of both regions.

In addition to her DPM role, Ms. Kelley has extensive experience with environmental sampling and will provide oversight and technical direction for the QC of field and laboratory data. Mr. Short's project duties will also include oversight and technical direction for the project safety program, TPP presentations, and UXO technician assignments.

Field Team Leader

Dedicated Parsons' Site Visit Teams (SVTs) will conduct all field work associated with each individual site during a single mobilization effort. Each SVT will include a Field Team Leader (FTL) who will manage all field activities under the direction of the Parsons' PM and DPM. The SI project team will include several pre-trained FTLs to ensure consistency of the individual site data collection efforts.

Specific responsibilities of the FTL include scheduling daily safety meetings, scheduling and coordinating field team activities, and submitting a Daily Progress Report (Appendix F) to the Parsons' PM. The FTL will be responsible for direct oversight of all field activities during the SI. The FTL will coordinate with the Parsons' PM as necessary to take corrective actions to assure that budgets and schedules are enforced. FTL duties will also include enforcing compliance with the Programmatic Accident Prevention Plan (PAPP) and general daily field operating procedures.

The FTL reports to the Programmatic QC Manager (PQCM) on quality matters and has responsibility for overall quality of work performed on site.

Project Chemist

Ms. Tammy Chang is the Project Chemist. She will assist in preparation and review of the PWP and SS-SAP, provide technical support to the field sampling teams, review analytical results, provide analytical QC, and prepare laboratory data validation reports in compliance with project requirements. As stated above, Ms. Laura Kelley will also provide Ms. Chang with oversight and technical support.

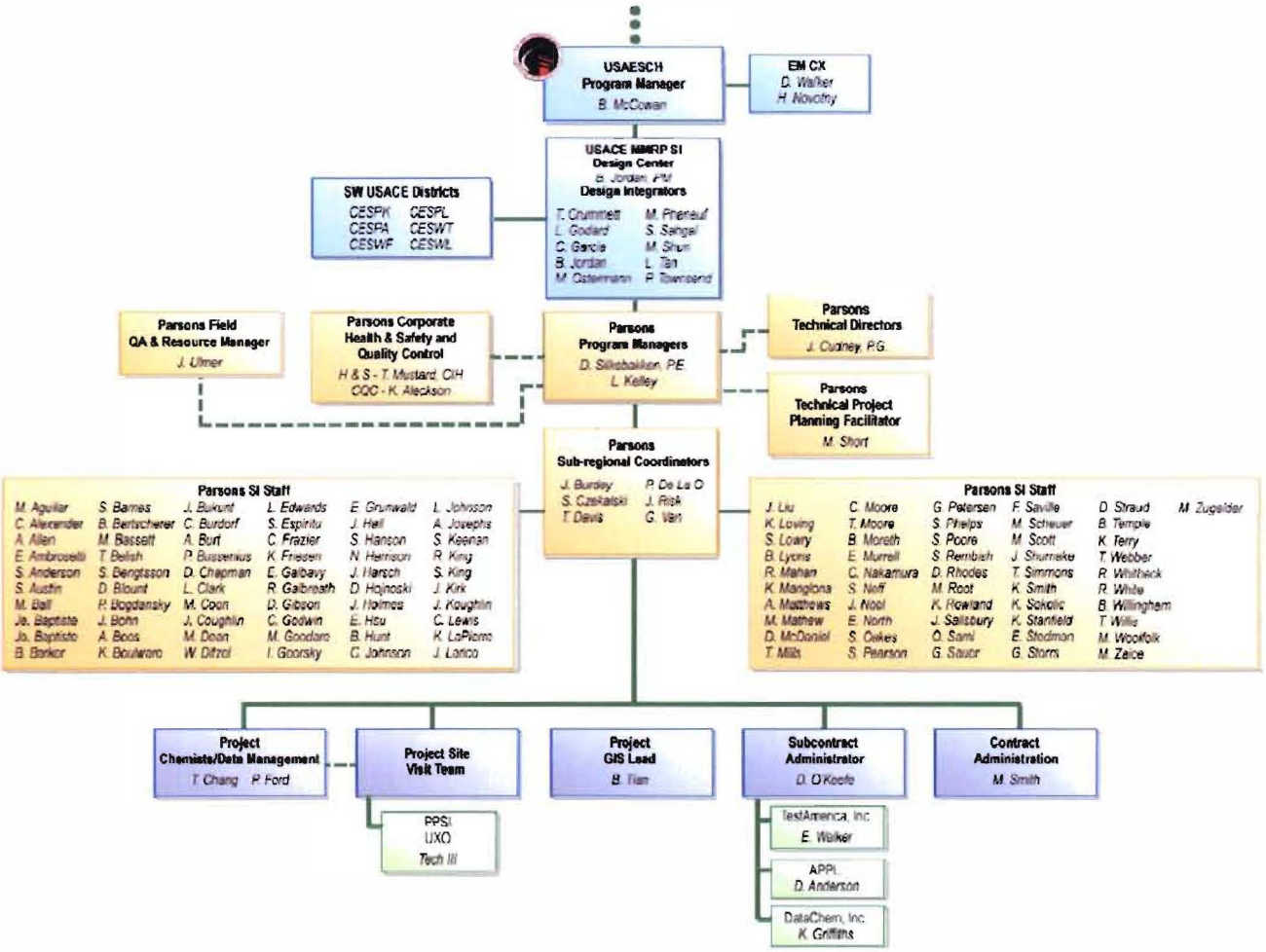
UXO Personnel

Each SVT will include a UXO Technician III (or higher). The UXO Technician will ensure safety protocols are followed, provide UXO avoidance, and MEC identification. For this project, UXO will not be handled by UXO field personnel and non-UXO qualified personnel never handle MEC under any circumstances. In the unlikely event UXO or suspect UXO is encountered, Parsons will notify the property owner, the USACE geographic Design Center (CESPA), and the local USACE District PM. In addition, Parsons will provide the appropriate emergency response contact information, upon request. SI activities in the immediate area of the finding will cease.

The UXO Technician reports to the PQCM on quality matters and is the key MEC-related QC person onsite. The UXO Technician reports to the Parson Safety and Health Manager (PSHM) for safety related issues and serves as the SVT safety officer.

Dedicated Parsons Site Visit Teams (SVTs) will conduct all field work associated with each individual site during a single mobilization effort. The duration of the field portion of the SI will vary by site and will be dependent on the amount of data collection planned following the TPP process. Each SVT will, at a minimum, include one senior scientist, geologist, or task order engineer with prior SI expertise, who will serve as the team leader and be familiar with the unique characteristics of the site pursuant to our individual site evaluations. A UXO Technician III (or higher) will accompany each SVT and will ensure safety protocols are followed, provide UXO avoidance, and MEC identification. SVT's may be augmented from a pool of prequalified additional personnel, as warranted, to support coincident reconnaissance and environmental sampling efforts. In accordance with the March 2005 Munitions Constituent (MC) Sampling Technical Update, all personnel performing environmental sampling will be trained in appropriate sampling procedures and associated documentation requirements under the supervision of a qualified chemist. Similarly, personnel performing reconnaissance (described in detail below) will have either significant prior field experience or will receive training prior to mobilization to the site.

Exhibit 1 – Organization Chart



WORK PLANS

Parsons has prepared a Draft and Final Programmatic SI Work Plan (PWP) for this project in accordance with the applicable sections of Data Item Description (DID) MR-001. ***After review and revision the Final PWP was approved in October 2005.***

The PWP describes the goals, methods, procedures, and personnel used for all of the field activities for the entire project and includes those components and sub-plans applicable to the project work. The overall geographic information system (GIS), site visit, and reconnaissance methodology is described in detail. In addition, the MC sampling approach is outlined. Since the site locations and conditions are highly variable, Parsons included to the extent practicable a wide array of safety factors.

For each site a draft and final SS-WP to the PWP will be prepared stipulating key site-specific information. The SS-WP will reference the Final PWP to the extent practical and focus on describing the relevant project components and logistical details pertaining to the specific site. Potentially dangerous local flora and fauna will be addressed in the SS-WPs and associated site-specific Safety Plan. Further, only cursory evaluation of endangered species information will be required because of the generally non-intrusive nature of field activities. For sites partially or wholly within wildlife management areas or similar protected areas the local governing agency will be consulted to ensure the most current information of protected species, sensitive environments, and culturally significant areas is captured and avoided during SI field activities.

The PSAP presents the details for environmental sampling that will be conducted during the project. As part of the SS-WP, a site-specific SAP annex (SS-SAP) will be prepared outlining the sampling strategy for each individual site.

ESTABLISHMENT AND MAINTENANCE OF GIS

A GIS database will be developed and managed for this project in accordance with DID MR 005-07 that will include spatial data from all of the different sites. Where available, spatial data from ASRs, Topographic Engineering Center (TEC) analyses, or previous MEC or HTW investigations will be used to form the baseline GIS data layers. At a minimum, the scanned USGS topographic sheets (Digital Raster Graphics also known as DRGs) and Digital Orthophoto Quandragles (DOQs) will be acquired.

Data for each project will be stored in the appropriate UTM coordinate system, using NAD 1983 datum. Mapping and data manipulation will be performed using ESRI ArcGIS software. Final output will be in ESRI Shapefile (ArcView) format. Maps will be generated in the standard USAESCH GIS format. Final maps for all sites will have a consistent format that will facilitate use in reports.

TECHNICAL PROJECT PLANNING

For each individual FUDS MMRP site, the TPP process will be initiated to determine the data needs to reach project closeout, develop DQOs, and develop the initial CSM. The TPP process will be conducted regardless of whether the completed PA efforts in support of the INPR or ASR (or any other prior site investigations) indicate confirmed or potential presence of MEC, as required by ER 200-3-1 paragraph 4-4.1.2.1. However, the extent of TPP activities may vary by site, as appropriate, to reflect the available body of data and presumptive remedies. For example, sites for which UXO presence has been either confirmed or overwhelming evidence supports UXO presence, the TPP will be tailored to focus toward anticipated RI/FS follow-on activities and approaches. As such, the SI field data collection for sites

falling into this category (Category 2) will be oriented primarily toward *qualitative* definition of MEC contamination extent and concentration. In addition, screening will be conducted for MC presence in environmental media. However, "characterization" of contamination (both MEC and MC) is not the objective of SI. In contrast to Category 2 sites, TPP objectives for Category 1 sites (anticipated NDAI based on desktop review of existing data) will gravitate toward a vision of closeout. As such, the SI field data collection for sites falling into this category will be oriented primarily toward production of sufficient and compelling evidence to satisfy regulator and other stakeholder concerns. In all cases, the TPP efforts will comply with EM 200-1-2 and EM 1110-1-1200 to ensure that the project establishes DQOs that are agreed to by all stakeholders prior to commencement of SI field activities.

The TPP process will be implemented at each site in coordination with the USACE Design Center and USACE District. Parsons' regional PM and one other key project individual (SI Program Manager, Technical Lead, etc.) will attend two TPP meetings per site. The duration of each meeting will vary depending on a number of factors including, but not limited to, location, site complexity, community and regulatory interest, and confirmed MEC presence. In conjunction with the two (or more) site-specific TPP meetings these individuals will collect peripheral data (County property records, incident reports, interviews, etc) and thereby complement the efforts of the SVT.

At the conclusion of the TPP meetings a post TPP Memorandum document will be prepared for each site identifying the agreed project DQOs and other pertinent decisions for subsequent inclusion in the site-specific SI-WP. A Draft and Final document will be prepared with all comments addressed.

CONCEPTUAL SITE MODEL

As part of the TPP process, CSMs have been developed (graphical, tabular, and animated) for each site in accordance with EM 1110-1-1200. The CSM will periodically be revised throughout the course of the project following TPP and the field effort. The current CSM will be included in the SI Report for use during follow-on activities, if applicable, outside the SI scope.

SCHEDULES

The programmatic and site-specific schedules will be revised and updated as part of the TPP process and in accordance with DID MR-085. Site-specific schedules will be submitted after completion of the TPP process.

SITE VISIT

ER 200-3-1 paragraph 4-4.1.2.1 requires a Site Visit for all MMRP SI efforts. For this project a dynamic field team will be deployed from a pool of dedicated pre-qualified and pre-trained individuals to optimize the effectiveness of the Site Visit data collection effort at each site. The primary objective of the Site Visit is to gather additional historical data and site-specific data to confirm data needs and the nature and scope of the SI. This effort will be closely coordinated with the TPP process. At a minimum, the following field components will be conducted as part of each Site Visit.

- Ground truth and confirm site boundaries, former targets, and ground scars.
- Evaluate vegetation and topographic conditions.
- Confirm soil characteristics and variability over site.
- Evaluate potential exposure pathways.

- Collect and update ASR (PA equivalent) documented archival research and incident reports.
- Conduct geophysical (hand-held instrument) reconnaissance of all or select portions of the site for avoidance;
  - To identify munitions debris or MEC on the surface but below the leaf litter.
  - To assist with selection of MC sampling locations.
- Update property ownership.
- Review onsite and regional growth and development.
- Conduct supplemental interviews.
- Establish key points of contact.
- Photograph the site and significant features.
- Conduct limited MC sampling.
- Determine drinking water sources.
- Collect all data necessary for USEPA to conduct Hazard Ranking System (HRS) scoring.
- Collect all data necessary to complete the Munitions Response Site Prioritization Protocol (MRSPP).

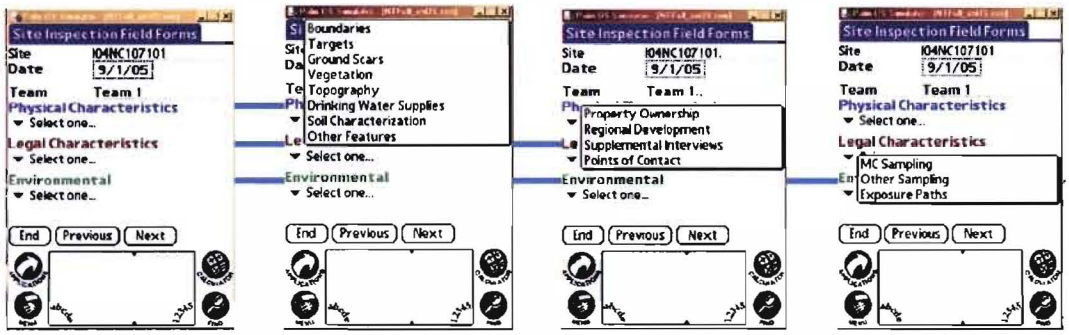
The duration of each Site Visit will vary depending on a number of factors including, but not limited to, location, site size and complexity, level of reconnaissance, MC sampling approach, and extent of existing historical data.

FIELD RECONNAISSANCE

In conjunction with the Site Visits, Qualitative Reconnaissance (QR) of "selected" areas within each site will be conducted, as warranted (and agreed upon during TPP). The primary objective of the QR is to reaffirm MEC presence, if previously documented, or to further support the absence of MEC within the entire site or specific sub-sites. In addition, the QR will:

- Aid in screening of rough lateral extent of MEC contamination areas (if present) based on visual observations;
- Confirm site boundaries, former targets, and ground scars; and
- Provide photographic documentation of vegetation, topographic conditions and other significant features.

The duration of the QR will vary by site depending on a number of factors including, but not limited to, location, site size and complexity, vegetation, and professional judgment of the necessary level of reconnaissance. Additional site-specific QR (SS-QR) data collection and justifications are presented below for each site based on Parsons desktop review of existing site data.



The same dedicated multi-purpose SVT will be used for all components of the field effort including the QR. The QR efforts will be refined and further developed during the TPP. In order to streamline data collection, ensure consistency, quality, and subsequent GIS manipulation, we will utilize a digital system to integrate textual, photographic, and GPS position data into a single Microsoft Access database. With few exceptions, a GIS data logger with a built-in megapixel camera, Bluetooth wireless connectivity, and common GIS data logger functionality will be used. The GPS will employ a Bluetooth wireless link to transmit position information to nearby computers or the GIS data logger. It has an internal point logging capability, so tracks can be kept and downloaded for later reference. It can also log raw data, which can be used to post process positions to sub-meter accuracy if necessary. The unit itself is a 12 channel parallel receiver with Wide Area Augmentation System (WAAS) capability. Rated accuracy with WAAS enabled is <3 meters.

For sites where the forest canopy or other cultural interference precludes use of all or part of the digital system hardcopy data collection will be available as a backup.

Parsons has already developed the electronic forms and pick lists to be utilized by the SVT, which ensures uniformity and completeness. In the event, UXO is discovered during the site reconnaissance effort, the item will be clearly marked and the property owner contacted. The SVT will not handle or be responsible for disposal or destruction of any MEC encountered.

MUNITIONS CONSTITUENTS SAMPLING AND ANALYSIS

In conjunction with the Site Visits, MC Sampling will be conducted within "selected" areas of each site, as warranted (and agreed upon during the TPP). The primary objective of the sampling effort will be to identify and screen the site for MC contamination. The sampling strategy will include collection of samples in areas with confirmed MEC presence and therefore the highest likelihood of having MC presence. In addition, samples will also be collected from low probability areas. For sites where RI/FS will follow the SI (Category 2), these samples will serve as background samples (when MC is not detected). For sites where NDAI is plausible (Category 1), high probability sample locations are generally not present. Thus, the number of site samples will be expanded and distributed throughout the site in an effort to present a compelling argument for NDAI to decision makers/regulators.

The location of each sample will be recorded with a GPS point taken for inclusion in the GIS database. In addition, tapes will be used to measure distances from significant nearby features.

The installation of groundwater monitoring wells during the SI phase is not standard industry practice and is not anticipated during the course of this project. ER 200-3-1 and other regulations and guidance

documents support this assertion. As an alternative, existing residential drinking water wells (when derived from groundwater sources) may be sampled for some sites. In addition, surface water, existing monitoring well, or irrigation well sources may also be appropriate. All facets of the sampling effort will be refined for each individual site as part of the TPP process.

Sample Collection

Before sampling at any location, the UXO Technician III (assigned to every SVT) will use an appropriate magnetic locator to confirm the selected sample location is free of surface and subsurface ferrous debris (potential MEC). If the selected location is not quiet (based on audible signals from the instrument) then an alternate sample location will be selected near the original location. This process will be conducted iteratively until a location can be deemed safe by the UXO Technician III.

The multi-incremental sampling requires the sampler to collect many incremental samples within a designated decision unit to build a single sample that is representative of the entire decision unit. To be representative of the decision unit, compositional heterogeneity and distributional heterogeneity of the sample are minimized through the process of collecting the sample. Compositional heterogeneity is inversely related to the mass of the sample. Distributional heterogeneity is inversely related to the number of increments used to build the sample. The large composite sample (1 to 2 kg) minimizes errors from both sources of heterogeneity. The number of increments to be collected for each sample will be agreed upon by the TPP Team and specified in the SS-WP. Generally 30 to 100 increments will be collected depending on the size and location of the decision unit.

Surface water samples are proposed for some sites. Surface water will be obtained as grab samples by submerging sample bottles into the water medium to fill up the sample containers. If a sediment sample is to be taken, the sampling site will be cleared by placing a magnetic locator in the water over the site to ensure there are no ferrous objects present. Sediment samples will be collected by lowering a stainless steel auger into the water body and into the bottom sediment, advancing the disposable auger bucket approximately one foot into the sediment, withdrawing the auger, and retrieving the sediment sample from the auger bucket with a disposable spoon into the appropriate sample containers. If surface water and sediment samples are co-located surface water will be collected first to reduce disturbance in the water sample. Additional details on sampling procedures for both surface water and sediment are specified in the Munitions Constituent Sampling Technical Update, March 2005 and PSAP and will be described in the SS-SAP.

In the event, UXO is discovered during the MC sampling effort, the item will be clearly marked and the property owner contacted. The sampling team will not handle or be responsible for disposal or destruction of any MEC encountered.

Analytical Procedures and Data Validation

Parsons will determine, in consultation with its subcontractor laboratory, appropriate analytical methodology to meet the DQOs developed during the TPP process. In addition, all applicable components of the PSAP (prepared by USACE) and the SS-WP will be addressed. Laboratory reporting limits and method detection limits will be incorporated in the PSAP, SS-SAP, and other appropriate documents. Standard laboratory operating procedures for sample preparation for the explosive analysis will be incorporated in the work plan.

Criteria listed in the DID MR-005-10 shall be followed by the laboratory and Parsons. In general, data validation for laboratory hardcopy reports will be performed by the Parsons' project chemist for all sample results in accordance with the requirements contained in the PSAP, SS-SAP, applicable USEPA Region SOPs, and the USEPA *National Functional Guidelines for Data Review* (USEPA, 1999, 2004, and 2008). Data qualifiers applied during the data validation process will be added to the electronic files. Laboratory results will be assessed for compliance with required precision, accuracy, completeness, comparability, and representativeness.

SI SAFETY

For this program, Tim Mustard, a CIH with over 26 years of experience implementing health & safety (H&S) policies and procedures at HTW and munitions response sites, will be the safety officer. He brings extensive field experience and has either developed or reviewed over 20 Accident Prevention Plans in compliance with DID MR-005-05 specifications. Furthermore, Mr. Mustard reports directly to our PI&T Safety Manager, Jim Owen. This independent reporting structure ensures that any differences of opinion with the Project Manager are reconciled quickly and effectively with minimal impact to the project and no conflict of interest.

Parsons evaluates and mitigates risk by the use of a Four-Phase Risk Model, which states: identify the risk, assess the risk (probability, consequence and risk level), plan risk mitigation (avoidance, reduction, mitigation), and execute.

Each SVT will include a dedicated UXO Technician III solely responsible for site safety with stop work authority. The safety technician will conduct site-specific safety training and, when applicable, UXO recognition training for all site personnel prior to commencing site activities. At some sites unique site-specific safety factors will be considered.

SI QUALITY CONTROL

Parsons' approach to quality is to define mutually agreed upon goals and objectives for each project site, and achieve these goals and objectives through a system of audits, enforcement, and feedback. The inclusion of the TPP process will ensure that the appropriate emphasis is placed on attaining the DQOs established early in the process. Keith Aleckson serves as the CQC Manager on this project. Mr. Aleckson is an ASQC Certified Manager of Quality/OE, is a certified ISO 9001:2000 Lead Auditor, and has 20 years of quality control experience in remediation projects for USEPA and Department of Defense programs. As in our safety program, the Quality Manager also has independent reporting to our Company QC Manager, Sabash Damle.

Parsons will develop an overriding Program QCP that defines the processes and procedures for addressing quality. This plan defines the responsibilities at the program and project levels, as well as the overall procedures and process to be implemented at the site level. Each site will have a clearly defined QCP developed as part of the work planning process that defines site-specific procedures, metrics, and goals. These procedures incorporate the requirements of DID MR-005-10, Munitions Constituents Chemical Data Quality Deliverables, and ensures independent quality control audits of the sampling laboratory are conducted on a periodic basis.

MMRP SI Project Key Contacts
Former Los Alamos Demolition Range
Los Alamos County, New Mexico

Organization	Name	Telephone/FAX
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Los Alamos National Laboratory 3747 W. Jemez Rd, Mailstop: AS16 Los Alamos, NM 87544	Ms. Cheryl Rodriguez ***Email:*** CRodriguez2@doeal.gov	(505) 665-5330
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MMRP SI Project Key Contacts (Continued)
Former Los Alamos Demolition Range
Los Alamos County, New Mexico

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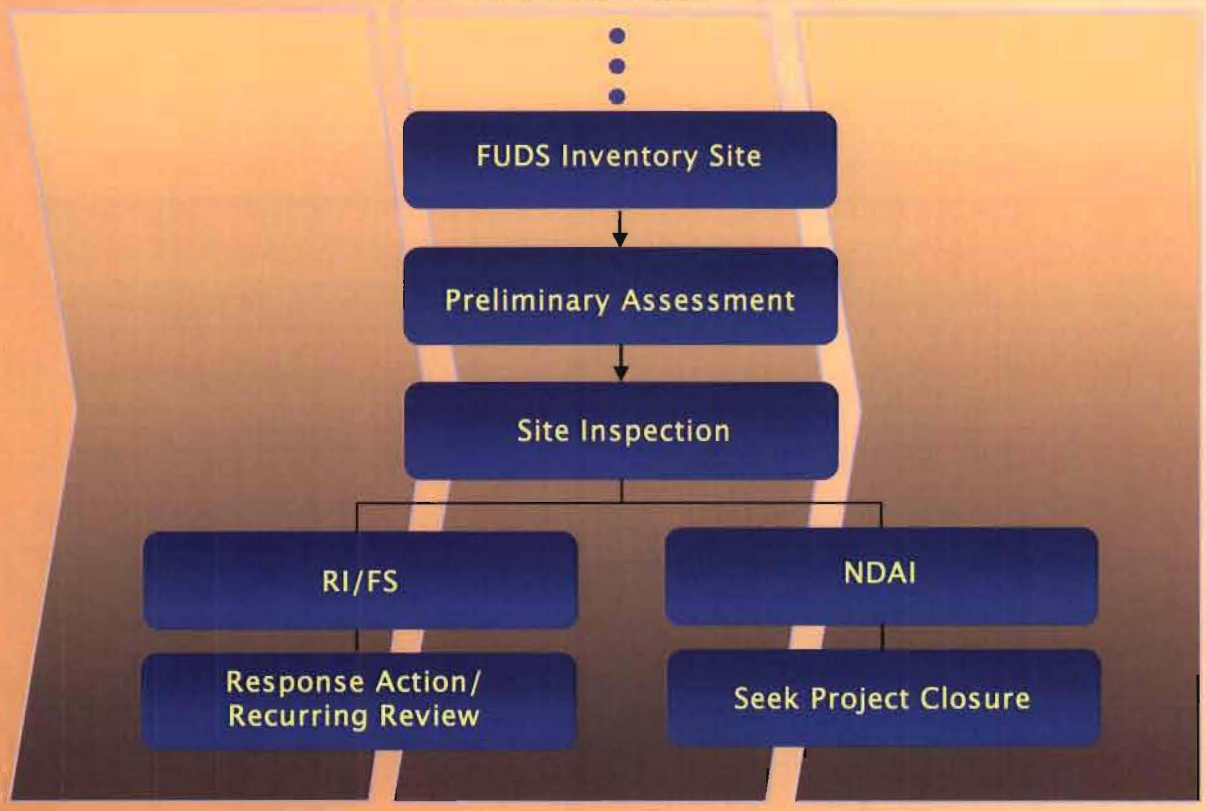
Parsons 1700 Broadway, Suite 900 Denver, CO 80290	Mr. Thomas Mills Field Team Leader ***Email:*** thomas.mills@parsons.com	(303) 764-1985 (303) 831-8208 (FAX)
Parsons 1700 Broadway, Suite 900 Denver, CO 80290	Ms. Gretchen Sauer Field Team Leader ***Email:*** gretchen.sauer@parsons.com	(303) 764-1938 (303) 831-8208 (FAX)

MMRP SI PROCESS FLOW

Former Los Alamos Demolition Range
Los Alamos, New Mexico



SITE-SPECIFIC SI TECHNICAL APPROACH

Former Los Alamos Demolition Range

The former Los Alamos Demolition Range is in Los Alamos County, New Mexico. The original boundaries of the Los Alamos Demolition Range formed the current boundaries of Los Alamos County. Most of the land in Los Alamos County is owned by the Department of Defense (DoD), the Forest Service, and the Department of Energy (DOE). The small part that remains makes up the City of Los Alamos. The areas designated as the Los Alamos Demolition Range surround the present city of Los Alamos. The southeast and northwest corners of the site are respectively 15 miles and 32 miles northwest of the city of Santa Fe, New Mexico.

In 1943, the DoD acquired 50,078 acres of land to establish the Los Alamos Demolition Range. The acquisition included 3,600 acres in fee land, 46,432 acres of public domain land withdrawn from the United States (U.S.) Forest Service, six acres of easement, and 40 acres of leased land.

The site was used and is still used for nuclear weapons research and development, high explosives testing, modified conventional ordnance testing, and radioactive materials testing. Site features included burning pits, firing areas, earthen berms, drop towers, a betatron, an x-ray generator, bunkers, cloud chambers, mortar impact areas, concrete buildings, observation buildings, open and enclosed firing rooms, and wooden and earth-covered magazines. Although the site is now under control of the DOE, it began under control of the Manhattan District of the Corps of Engineers. Ownership was then transferred to the Atomic Energy Commission (AEC) when the DoD excessed parts of the property in December 1946, and then briefly to the Energy Research and Development Administration (ERDA). The DOE, successor agency of the AEC, returned a major portion of the site to the Forest Service and released 908 acres to the General Services Administration (GSA). In 1967, the DOE released 3,350 acres to Los Alamos County. The rest of the former Los Alamos Demolition Range is still government controlled.

According to the Archive Search Report (ASR) for the former Los Alamos Demolition Range, conventional ordnance ranges used at Los Alamos by the military security force and the Army were referred to as conventional weapon areas (CWAs) and were numbered from CWA1 to CWA9. These ranges are either still used, modified for current use, or have been demolished and abandoned All nine areas were included as part of the 1999 ASR field visit.

Since 1943, the DoD, the AEC, the short-lived ERDA, and the DOE used 75 technical areas (numbered TA-0 through 74) for a variety of purposes. The 32 technical areas developed and used by the DoD were the focus of the ASR. Of the 20 technical areas known to have been used for ordnance activities, 14 were fenced off for safety and/or security reasons and were not included as part of the 1999 ASR field visit. The remaining 6 technical areas were visited during the ASR, and site-specific information was recorded. No certificate of clearance was found for any of the sites.

The 1996 inventory project report (INPR) assigns a risk assessment code (RAC) score of 1 based on a hazard severity of *catastrophic* and a *frequent* hazard probability. This score is based on a previous site investigation of areas in a wide range of conditions and is the only score available in historical documents. It is not representative of individual areas for this SI, as some have been improved for public use (e.g., parking lots) and some are still fenced off. For this project, efforts

will focus on the 9 CWA's and 20 technical areas shown on Figures 3A and 3B. Table 1 summarizes information about the sites at the former Los Alamos Demolition Range.

Table 1 – Site Details
Former Los Alamos Demolition Range, New Mexico

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
FUDS, Former Los Alamos Demolition Range	50,078		Numerous		
FFID NM69799F613200 Demolition Range Project Areas	23,750				
CWA 1 – bazooka range	179.3	27-003	Rocket, HEAT, 3.5-inch, M28 Rocket, practice, 3.5-inch, M29	Yes	Rock-face target Munitions debris found Archeological site
CWA 2 – 2.36-inch bazooka range	197.3	00-011(d)	Rocket, 2.36-inch antitank, M6A1 Practice, M7	Yes	Canyon near highly developed (residential) area No munitions observed
CWA3 – mortar impact area		C-00-020	Mortars	Yes	Behind residential area No munitions observed
CWA 4 – rifle range	157.0	00-016	No munitions-use information recorded	Yes	Excavated area for home construction No munitions found
CWA5 – Sportsman's Club		00-015	Six round, 3-foot wide, 1.5-foot deep potential craters Earthen berms Projectiles, .50-caliber Small arms, .50 caliber	Yes	Currently used as a civilian trap and skeet range; evidence of recreational use .50-caliber projectiles found on two of three berms on the small arms range; evidence of non-civilian use

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
CWA6 – small arms range		00-011(a)	Civilian small arms range	Yes	Cylindrical pieces of steel found – used as targets, but the type of rounds is unknown
CWA7 – explosives warning signs area		00-011(c)		Yes	Hilly wooded area north of Rendija Road No explosive signs or ordnance found
CWA8 - Rendija Canyon demolition range – 20mm and 37mm test range (Part of TA-0)	20	00-011(e)	Cartridge, 20mm, ball, M55A1 Shell, fixed, 37mm, HE, MKII Shell, fixed, HE, 37-MM, M54, with self destruct tracer Cartridge, 37mm, TP, M63 MOD1 60mm mortar shrapnel found in 1965 survey	Yes	Fatal accident occurred in 1960s .50-caliber projectiles found Danger and explosive warning signs Numerous munitions scars on the face of mountain
CWA9 – possible anti-aircraft gun positions		None		Yes	No ordnance found
TA-3 - South Mesa		03-008(a)	HE shots PETN and azide detonators Burn pits	Yes	DOE owned; currently a parking lot No ordnance observed
TA-4 -Alpha Site		04-001-99	½-pound to 1,000-pound HE shots	Yes	Abandoned in late 1940's and decontaminated in 1985 No ordnance found in 1999

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
TA-5 - Beta Site		05-001(a)-99 05-001(c) 05-005(a)-00	Firing pits 1,200- and 2,500-pound charges Uranium use	Yes	Decommissioned and decontaminated in 1985 Archaeological site Evidence of activity on opposite side of the road, but no ordnance was found
TA-6 – Upper Two Mile Mesa		06-002-00 06-003(a)-99 06-003(d) 06-003(e) 06-003(f) 06-003(h) 06-005	Unranium 235 gun bomb Plutonium use Azide and PETN detonators HE systems 13 storage magazines	No – behind security fence	Vacant and inactive during time of the ASR report
TA-7 - Lower Two Mile Mesa (Gomez Ranch)		07-001(a)-99	20mm polonium radioactive shot was fired Burn pit and two firing pits in earth embankment	No – behind security fence	Site is currently inactive
TA-8 - Anchor gun site – west		08-002 08-006(a)	139 depleted uranium rounds Sabots with steel projectiles Tuballoy (natural uranium in refined condition) 20mm tungsten carbide, MK34, MK38, and various radiation tests Gun mounts and gun barrels buried in this area in 1946	No – behind security fence	Included a movable gun house and multiple firing sites Currently used for testing radioisotopic techniques and for ultrasonic, penetran, and electromagnetic testing.

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
TA-9 – Anchor HE – east		09-001(c) 09-001(d) 09-002	X-ray chamber, firing pits, burn pit, firing point ("Far Point") Spherical shape charges 10- and 500-pound Composition B charges, primacord experiments, and handlebar detonation units	No – behind security fence	Accident recorded in 1944 with primacord In 1959, two firing chambers were contaminated with HE, and in 1965, the center and west firing chambers were deemed contaminated
TA-10 – Bayo Canyon – Site X		10-001(a)-99	Lanthanum-140 and Stronium-90 HE detonations with 500- and 600-pound shots MK-43 igniters X-Unit chamber Two firing sites each with two firing points	Yes	Currently used for recreational activities. Found numerous 6-foot-diameter flat spots with metal fragments and firing wires and no vegetation
TA-11 – K Site		11-006(a)-99 11-003(a) C-11-003	Betatron and cloud chamber (to study implosion symmetry of HE) 180-pound HE 6-inch aluminum sphere experiments with 1-inch tuballoy core 155mm mortar impact area Drop tower experiments Unnamed radioactive material tests	No – behind security fence	

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
TA-12 – L Site		C-12-002 C-12-003 12-001(a)-99	Uranium and lead shots of wide variety Fragment concern from 2500-pound shots fired from R Site 1000-Ci radioactive lanthanum-140 experiments	No – behind security fence	Not visited in 1999
TA-13 – P Site		13-001-99 13-001 13-002	X-ray generator, firing site, two bunkers Tests with 20-pound and 200-pound charges, 8-pound non-lens charge, 60-pound lens charge, and implosion tests using the Monroe jet Polonium use	No – behind security fence	Site was not visited in 1999
TA-14 – Q Site		C-14-008 14-002(a)-99 14-009	Uranium and beryllium used between 1943 and 1946	No – behind security fence	Site not visited in 1999
TA-15 – R Site		C-15-004 15-009(e) 15-002-0	Two firing sites: one for items less than 50 pounds and other for larger items Natural and depleted uranium, 2500-pound shots, 2 ton HE shots, 2 ton TNT shot	No – behind security fence	Tests included same as for nuclear weapons without the fissionable material, 1996 ASR states R Site is the home of PHEREMEX weapons development testing Site not visited in 1999
TA-16 – Sawmill Site		C-16-023 16-009(a) 16-006(a)	Included 35 magazines (wood and concrete), numerous buildings for producing HE, and a burn pit.	No – behind security fence	Magazine Areas "A" and "B" located south of TA-16 More than 200 buildings and structures

Site	Size (Acres)	Associated Identification (AOC/SWMU)	Munitions Used / Site Features *	Part of 1999 ASR Inspection?	1999 ASR Historical Notes
TA-17 – X Site		C-08-09 C-08-008 C-08-007		No – behind security fence	Abandoned during planning
TA-18 – Pajarito Laboratory Upper		18-011 18-012(c) 18-012(d)	HE, 10 pound to 200 pound HE, 600- and 4,500-pound charge Small arms Bazooka Depleted uranium and beryllium cylinders Drop tests with Fat Boy units loaded with HE	No – behind security fence	Unable to inspect the area because it was behind the security fence
TA-20 – Sandia Canyon		C-00-008	Radioactive material and uranium initiators fired from smooth-bore 20mm Navy guns 500-pound Compositon B	Yes	Owned by the DOE No ordnance found during 1999 field visit
TA-27 – Gamma Site (Pajarito Laboratory Lower)		27-001 27-002	Two concrete bunkers, a series of manholes, and five round firing pits Large shots containing uranium, thorium, or beryllium Local cliffs used as targets for bazooka training	Yes	A 1962 fatality involving a bazooka round found just north of the site 1999 field team observed munitions debris scattered across lower area
TA-28 – Magazine Area A		None	Five magazines used for storing HE	No – behind security fence	
TA-29 – Magazine Area B		None	Small magazine storage area dating back to 1944	No – behind security fence	

* Site inspection data from the ASR (USACE 1999)

Bazooka Range (CWA1)

This area, 1 mile east of the Pajarito Laboratory TA-18, was used for bazooka firing practice. The coordinates of this area are 35°50'13.93"N and 106°14'58.70"W. The rock face was used as a target. The fenced yet easily accessible area encloses 179.3 acres owned by the DOE. The 1999 ASR field team observed munitions debris but no munitions and explosives of concern (MEC). The team also observed cliff dwellings in the rock face, broken pottery scattered on the ground, and petroglyphs, giving this site archeological importance.

No SI field work is anticipated for this area. The 1940 era firing sites are contained in the Lower Pajarito Aggregate Area.

2.36" Rocket Range (CWA2)

The rocket range is adjacent to San Ildefonso Road, with the surrounding area being highly developed. According to the ASR, discovery of 2.36-inch rockets spurred construction of the fence previous to the 1999 field visit. An unlocked gate allows access for the public, although terrain is rugged and steep in parts. No debris was observed during the ASR field visit.

This area has been previously investigated. Latest consent order investigation (Winter 2006-2007) found no munitions debris. No SI field work anticipated in this area which is contained within the Guaje/Barrancas/Rendiaja Canyons Aggregate.

Mortar Impact Area (CWA3)

The area on the north face of Rendija Canyon is only a suspected range. This wooded and hilly area is behind a residential subdivision. No debris or ordnance was observed during the ASR field visit.

There is no evidence that this site was ever used. No SI field work is anticipated for this area which is contained within the Guaje/Barrancas/Rendiaja Canyons Aggregate.

Rifle Range (CWA4)

This area is within a new residential area, and the exact boundaries can no longer be determined. No munitions debris was observed during the field visit.

This site currently has a No Further Action recommendation and is off of the RCRA permit. No field work is anticipated for this area.

Rendija Canyon Demolition Range (CWA5 to CWA8)

The Rendija Canyon Demolition Range is 20 acres of land in two separate locations within the northeast part of the Los Alamos Demolition Range. It is in part of Township 19 North, Range 6 East within Sections 1 and 2. It was used by the Department of the Army from 1943 to 1946 for high explosive tank and anti-tank munitions testing. An International Technology Corporation report dated March 3, 1992, states that a fatal accident occurred in the 1960s. According to an interview documented in the ASR, children living in the area found live ordnance, took it home, and dropped it, causing an explosion. Since then, a military ordnance team from Fort Bliss, Texas, has conducted annual surface sweeps of impact areas to remove items exposed by erosion. These areas are now called CWA6, CWA7, and CWA8. Alternate references to the areas

include Range 0-011(b,a), explosive warning signs area, and Range 0-011(a), respectively. CWA6 is included in this summary of the Rendija Canyon Demolition Range as part of the project area of a previous Rendija Canyon field visit.

CWA5 is alternatively named the Sportsmen's Club, which is less than ½ mile from the other three sites. The 1999 ASR field visit observed six potential craters that were perfectly round, 3 feet in diameter, and 1 to 1.5 feet deep. Additionally, .50-caliber projectiles and three earthen berms were observed. It is currently used as a civilian trap and skeet range.

No field work is anticipated for CWA5 – Sportsmen's Club. Parsons will help to identify potential PRP MRS.

A field team evaluated CWA6 and CWA8 on July 8, 1992, and found no evidence of ordnance or remnants of weapons. In 1999, the ASR field visit was conducted at CWA5 through CWA8.

At CWA6, the ASR field team found evidence of civilian dirt bike use and of small-arms and non-civilian arms use on scrap metal targets found on the site.

No field work is anticipated for CWA6. This site is covered under the Guaje/Barrancas/Rendiaja Canyons Aggregate.

The ASR field visit found nothing at CWA7.

No field work is anticipated for CWA7. This site is covered under the Guaje/Barrancas/Rendiaja Canyons Aggregate.

At CWA8, the field team found explosive warning signs, scarring on the canyon wall, and one .50-caliber projectile.

No field work is anticipated for CWA8. This site is covered under the Guaje/Barrancas/Rendiaja Canyons Aggregate.

Possible Anti-Aircraft Gun Position (CWA9)

This area is rumored to have had an anti-aircraft gun position near the top of the mountain north of Pajarito Mountain. The road is only accessible in a four-wheel-drive vehicle. The field team found concrete foundations that appeared to be unrelated to the rumored anti-aircraft gun. No munitions debris was observed.

No one has heard of this site. Possible limited site visit, but probably just include in the report since the ASR field team already investigated and only found a concrete foundation unrelated to DoD activities.

South Mesa Site (TA-3)

Structures include a firing room, a production shop, and four magazines. In October 1943, photographic work of high explosive light sources was conducted. In 1945, tests with PETN and azide detonators were conducted. Burn pits existing in 1945 were used for burning high explosives and other materials. In 1949, detonation operations were moved to Two Mile Mesa,

and later TA-3 became an administration center. It is currently a parking lot owned by the DOE. No ordnance was found during the 1999 field visit.

DOE owned area located under the old administration building.

Alpha Site (TA-4)

Structures were built at this site by 1945 and conducted firing experiments from 1945 to 1946. High explosive shots ranged from ½ -pound to 1,000 -pounds. The site was abandoned in the late 1940s and was decontaminated in 1985. In the 1999 field visit no ordnance was found, and there was evidence that the buildings were removed.

Site is covered under the Middle Mortandad/Tensite and Upper Canada del Buey areas.

Beta Site (TA-5)

This area is just north of an unnamed road that turns off Pajarito Road, just east of the Alpha site. TA-5 had two firing pits, two magazines, and administrative buildings. In May 1945, 1,200-pound and 2,500-pound charges were fired. Concern over uranium contamination at the firing point led to abandoning the site in 1959. During the cleanup of the area, bomb debris was disposed of over the north face of Mortandad Canyon, contaminating the canyon all the way to the bottom. The AEC built a calibration facility in 1960 while conducting experiments with uranium, then abandoned it in 1974. The site was decontaminated and decommissioned in 1985. According to a 1996 report, support facilities and several archaeological sites currently exist. No munitions debris was observed during the field visit.

Site is covered under the Middle Mortandad/Tensite area.

Two Mile Mesa Upper (TA-6)

Manhattan Project members conducted most activities at this area, including experiments with implosion weapon, the uranium 235 gun bomb, plutonium use, azide and PETN detonators, and high explosive tests. TA-6 was constructed with three concrete firing magazines, two plywood storage magazines, and 13 wood and concrete storage magazines. In 1964, laboratory personnel confirmed the burial of gold-plated detonators and radioactive spark gaps. At the time of the ASR report, the area was mostly undeveloped and contained several vacant buildings. The area is behind a security fence and was not part of the 1999 ASR field visit.

Covered under Two Mile Canyon.

Two Mile Mesa Lower (TA-7), GOMEZ RANCH

TA-7 was built with several earthen berm firing pits located where 20-millimeter (mm) polonium radioactive shot was used. In the 1950s, scientists used the pits to destroy detonators and scrap high explosive items. At the time of the ASR report, the area was inactive. The area is behind the security fence and was not part of the 1999 ASR field visit.

Covered under Two Mile Canyon.

Anchor Gun Site West (TA-8)

The old Anchor Ranch was developed into a test range (TA-8) in 1943. Original construction included a movable gun house and several firing sites. Laboratory personnel fired 139 rounds, including depleted uranium rounds, from a modified anti-aircraft gun from September 1943 to February 1944. Personnel at the site also conducted day and night firing of sabots with steel projectiles, work with tuballoy (natural uranium in refined condition), and 20mm work with tungsten carbide. Other tests with experimental guns include use of the Mk 34 high capacity, Mk 38 armor piercing, Mk 38 quarter wave band, and Mk 38 flat nose projectiles. In 1944, radiation tests were conducted. In 1945 or during Operation Crossroads in 1946, two gun mounts, two long rifle barrels, and some short barrels were buried. The site is currently used for testing radioisotopes, ultrasonic and penetrant testing, and electromagnetic testing. This site could not be visited during the 1999 field visit.

08-002 was a firing site specifically for naval guns. All of this TA covered under Starmer/Upper Pajarito work.

Anchor Gun Site East (TA-9)

Original construction at TA-9 included an X-ray chamber, firing sites, a firing pit, a burn pit, a firing area called Far Point1, a casting room, a trimming room, two booster hutment buildings, a sintering hutment, three magazines, and a firing building. Activities included spherical implosion experiments in November 1943, firing of 10- and 500-pound charges, use of Composition B, primacord, and 1,773 experiments with handlebar detonation units. According to the ASR, an accident occurred with primacord in 1944. A cleanup of the site was initiated in 1965 after discovery of two high-explosive-contaminated firing chambers. Further investigation found that the center firing chamber and the west firing chamber were also radioactively contaminated. The latest information on the use of TA-9 in 1992 was to develop high explosives for the laboratory's nuclear weapons systems. A field visit was not conducted at TA-9 in 1999.

This TA is covered in the Starmer/Upper Pajarito work.

Bayo Canyon Demoilition Range (TA-10)

TA-10 is in Bayo Canyon about 5 kilometers east of the community of Los Alamos and 8 kilometers northwest of the community of White Rock, within Township 20 North, Range 6 East, Sections 12 and 13. The range is bordered on the north by Otowi Mesa and on the south by Kwage Mesa. Facilities for conducting high explosive munitions tests were constructed at the bottom of the canyon in 1943 and used until 1961, when experiments changed to development of nuclear weapons. In 1963, the facilities were demolished and decontaminated to detectable limits of the time. The cleanup removed 90 truckloads of radioactive debris from lanthanum-140 detonations on TA-10 and dropped it off on TA-54. Radioactive metal was discovered in 1966, followed by discovery of 32 MK-43 igniters during a subsequent cleanup in 1976. The land was given to Los Alamos County in 1967 and is currently used for public recreational activities. A portion of the area is fenced off, and excavation is prohibited until 2142 AD. The 1999 ASR

field team found numerous flat areas approximately 6 feet in diameter that contained metal fragments and firing wires. No vegetation grows in these flat areas.

Has one consolidated unit, with several firing sites within it.

K Site (TA-11)

During World War II, laboratory personnel installed a betatron and cloud chamber to study implosion symmetry of high explosive charges. Original construction also included a firing pit and three magazines. Experiments with 180-pound high explosives were conducted in October 1944, and 6-inch aluminum sphere experiments with 1-inch tuballoy core were conducted in August 1945. This site was used in the 1950s as a mortar impact area for the 155mm launchers, and an air gun building was built. In 1956, a drop tower was built and used for experiments until as late as 1972. According to a 1996 report, explosive testing with radioactive and nonhazardous materials is currently being conducted at this site.

11-003(a) is an inactive mortar impact area. This SWMU is not listed in Module VIII of the Lab's Hazardous Waste Facility Permit, and was proposed for NFA in the 1993 OU 1082 Work Plan EPA approved the NFA in 2004. Otherwise, TA-11 is completely covered in the S-Site Aggregate Area work.

L Site (TA-12)

Structures at this area included a generator, two magazines, a magazine control chamber, and two firing pits used for a wide variety of high explosive uranium and lead shots. The 2,500-pound shots from R Site in May 1945 created a fragment concern at L Site. Experiments with uranium-238 were conducted at this site as well. In the 1950s, the Biomedical Ground installed a radiation test bunker and experimented with 1000-Ci radioactive lanthanum-140. The site was abandoned in 1953. In 1962 a step-on can containing one-half pounds of explosives was burned. This site was not visited in 1999.

TA-12 is completely covered in the S-Site Aggregate Work.

P Site (TA-13)

This site included an X-ray generator, two bunkers, a firing site, laboratories, and storage buildings. Polonium contamination was found in the easternmost bunker in 1944. Experiments using 200-pound and 20-pound charges were fired at this site. Experiments also included tests with 8-pound non-lens charges, 60-pound lens charge, and implosion tests using the Monroe Jet. In 1944, an inspection team found radioactive polonium contamination in the easternmost bunker. In the 1950s, much of TA-13 was absorbed into the S Site (TA-16). This site was not visited in 1999.

Old P Site, now part of TA-16 and part of the S-Site Aggregate Work.

Q Site (TA-14)

The mission of this site was for close observation of small explosives. Structures included a closed chamber and open firing pedestal, four magazines, an observation building, an assembly building, and a laboratory. In May 1945, 2500-pound shots at neighboring R Site created fragment concerns at Q Site. Material use at this site included uranium and beryllium between 1943 and 1946. In 1952, firing sites were removed, an incinerator was installed, and a bullet test facility replaced the firing pedestal. This site was not visited in 1999.

Q Site, now TA-14, is completely contained in te Canon de Valle work.

R Site (TA-15)

Structures at this site included a small control building and two firing sites. One firing site was for munitions up to 50 pounds, and the second was for larger amounts. Tests included components of nuclear weapons without the fissionable material. Both natural and depleted uranium have been expended at this site. Experiments were conducted with 2500-pound shots in 1945, with 2-ton high explosive shots in 1946, and with "the largest quantities of hazardous materials" at four new firing pits experiments in 1947. In 1970, J Division personnel fired a 2-ton trinitrotoluene (TNT) shot at R Site. A 1996 report states that since 1966, R Site has been the home of PHEREMEX weapons development testing. This site was not visited during 1999.

R Site, now incorporated into TA-15, covered in the Threemile and Potrillo/Fence Aggregate Areas.

S Site or Sawmill Site (TA-16)

TA-16 is a huge complex that had more than 200 buildings and structures associated with it, including 35 earth and concrete magazines and a burn pit. TA-16 had a mission of high explosive research and development. In November 1944, the site laboratory ordered full-scale pentagon charges of pelleted Composition B from the S Site operation. The site researched and developed all forms of explosive charges, including casting explosive blocks, large hemisphere, large pentagons and a few smaller lenses. A 1945 status report showed the following explosives at TA-16: 82,000 pounds of barium nitrate, 42,000 pounds of TNT, 40,000 pounds of Composition B, 284 pounds of stearoxyacetic acid, 548 pounds of nitrocellulose, and 100 pounds of potassium nitrate.

Post-DoD activity included the removal of several magazines. Since 1992, the Weapons Engineering Tritium Facility has been located here. Development of high explosive munitions is still the mission at the site.

Sawmill Site, now part of TA-16 and part of the Canon de Valle Aggregate work.

X Site (TA-17)

This site was abandoned during planning.

X Site is part of TA-8 and covered in the Starmer/Upper Pajarito Aggregate Area.

Pajarito Laboratory (TA-18) Upper

During WWII, the Radioactivity Group conducted spontaneous fission measurements. In 1944, two firing pits and a drop tower were constructed in addition to the originally constructed two magazines. High explosive charges were used at this site, ranging from 10 to 200 pounds. The core of the test assemblies included marble, copper, lead, tuballoy, cadmium, aluminum, and lucite. Some experiments included depleted uranium, and others used beryllium cylinders. Drop tests occurred in 1944 using Fat Boy units loaded with high explosives. On January 9, 1945, scientists conducted a test with a unit that contained 4,500 pounds of high explosives, and 600-pound charges were used at the Pajarito Site in February 1945. In April 1946, laboratory management moved the critical assembly operations from TA-2 to TA-18. A former laboratory worker interviewed in October 1944 recalled the burial of long rifle barrels and small arms ammunition at Pajarito Canyon. In response, the ordnance detachment from Fort Bliss, Texas, resurveyed the site and recovered six tail assemblies of expended bazooka shells. The 1999 field visit visited only the lower area. Munitions debris was scattered everywhere, but no structures or MEC were found. The upper area is off limits and was not visited. The DOE owns both the upper and lower areas.

This laboratory, now part of TA-18, is completely covered in the Lower Pajarito Aggregate Area.

Sandia Canyon (TA-20)

Scientists used this area between 1944 and 1947 for radioactive material and uranium initiator studies fired from smooth-bore navy guns and 20mm guns. Evidence of a mortar impact area still exists on site. A low-order explosion occurred during a 500-pound Composition B experiment, which scattered the explosives. Within a year following the abandonment of the site in 1947, East Jemez Road was built over the area. Inspections for loose explosives began in 1962 and continued at two-year intervals until 1984. Inspectors occasionally found small pieces of loose explosives. Inspections in 1964 to locate buried Navy guns were unsuccessful. The 1999 field team found no ordnance.

C-00-008 is part of the Mortandad Canyon system.

Gamma Site (Pajarito Laboratory Lower) (TA-27

The 1999 field visit visited only the lower area. Munitions debris was scattered everywhere, but no structures or MEC were found. The upper area is off limits and was not visited. The DOE owns both the upper and lower areas.

1940 vintage firing sites completely contained in the Lower Pajarito Aggregate Area.

Magazine Area 'A' And 'B' (TA-28 and TA-29)

Magazine Area 'A' consisted of five magazines used for storing high explosives. Magazine Area 'B' was a small magazine area with activity dating back to 1944. Magazine Area 'B' was abandoned in 1957. These areas were off limits and not visited in the 1999 field visit.

Part of TA-16. Not covered by RCRA Corrective Actions.

General Site Information

The U.S. Fish and Wildlife Service indicates that five federally listed threatened and endangered species may occur in Los Alamos County, New Mexico.

Based on our understanding of the project site, Parsons sees this site as an anticipated ***focused Remedial Investigations and Feasibility Studies (RI/FS) site***. Historical documents indicated that TNT, Composition B, PETN, azide, nitrocellulose, barium nitrate, stearoxyacetate acid, potassium nitrate, and Primacord explosives were used at the site. The areas included for this SI (all conventional weapons areas) were not used for development of the atomic bomb and have no potential for radiological contamination. Only small arms, 20mm cartridges, 37mm cartridges, 2.36-inch rockets, and bazooka ordnance were used, although evidence of other munitions, such as. 50-caliber projectiles, was found in a previous field visit. However, exposure pathways may be complete due to the possible release of MC from munitions debris to soil at the site. In accordance with ER 200-3-1 and the performance work statement (PWS), sufficient data need to be collected during the site inspection (SI) to evaluate the presence of MEC and munitions constituents (MC) to allow RI/FS initiation or to confirm that no significant release is posed to public health and the environment, resulting in no Department of Defense action indicated (NDAI) status. The following activities could be used in support of the SI for the former Los Alamos Demolition Range in Los Alamos County, New Mexico. However, it is anticipated that existing information is available to evaluate the potential presence of MEC and MC at the former Los Alamos Demolition Range.

- **Site Visit** – Parsons could conduct a site visit in accordance with the Programmatic Work Plan (PWP) and the Site-Specific Work Plan (SS-WP). The site visit would focus on munitions-related features identified within the munitions response site (MRS). Data would be gathered to evaluate vegetation and topography as they pertain to site characterization and to identify potential limitations on subsequent recommended actions.

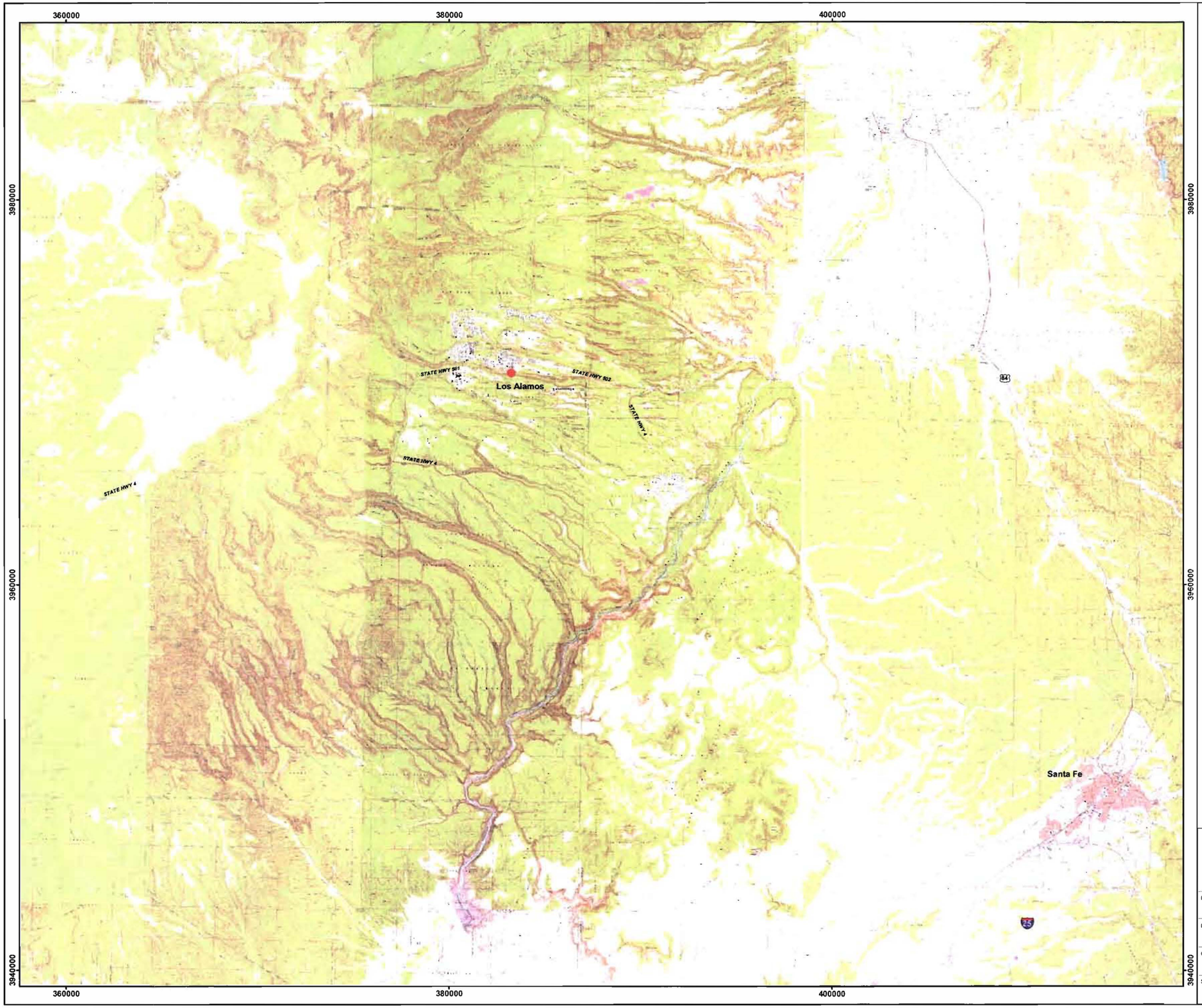
- **Qualitative Reconnaissance** – Parsons could conduct qualitative reconnaissance (QR) in accordance with the PWP. Emphasis would be placed on not only confirming the possible presence of munitions and explosives of concern but also sufficiently traversing the MRS to support the anticipated RI/FS recommendation. The exact areas to be surveyed would be discussed during the technical project planning (TPP) process.

- **Munitions Constituents Sampling** – Parsons could conduct MC soil sampling within the MRS in accordance with the PWP and the Programmatic Sampling and Analysis Plan (PSAP). Exact sample locations would be discussed as part of the TPP process.

Figure 1

Site Location
Los Alamos
FUDS Project No. K06NM004201

Los Alamos County, New Mexico



Legend

- Approximate Site Location

Site Location in New Mexico

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 13 NAD83, Map Units in Meters

3 1.5 0 3 Kilometers

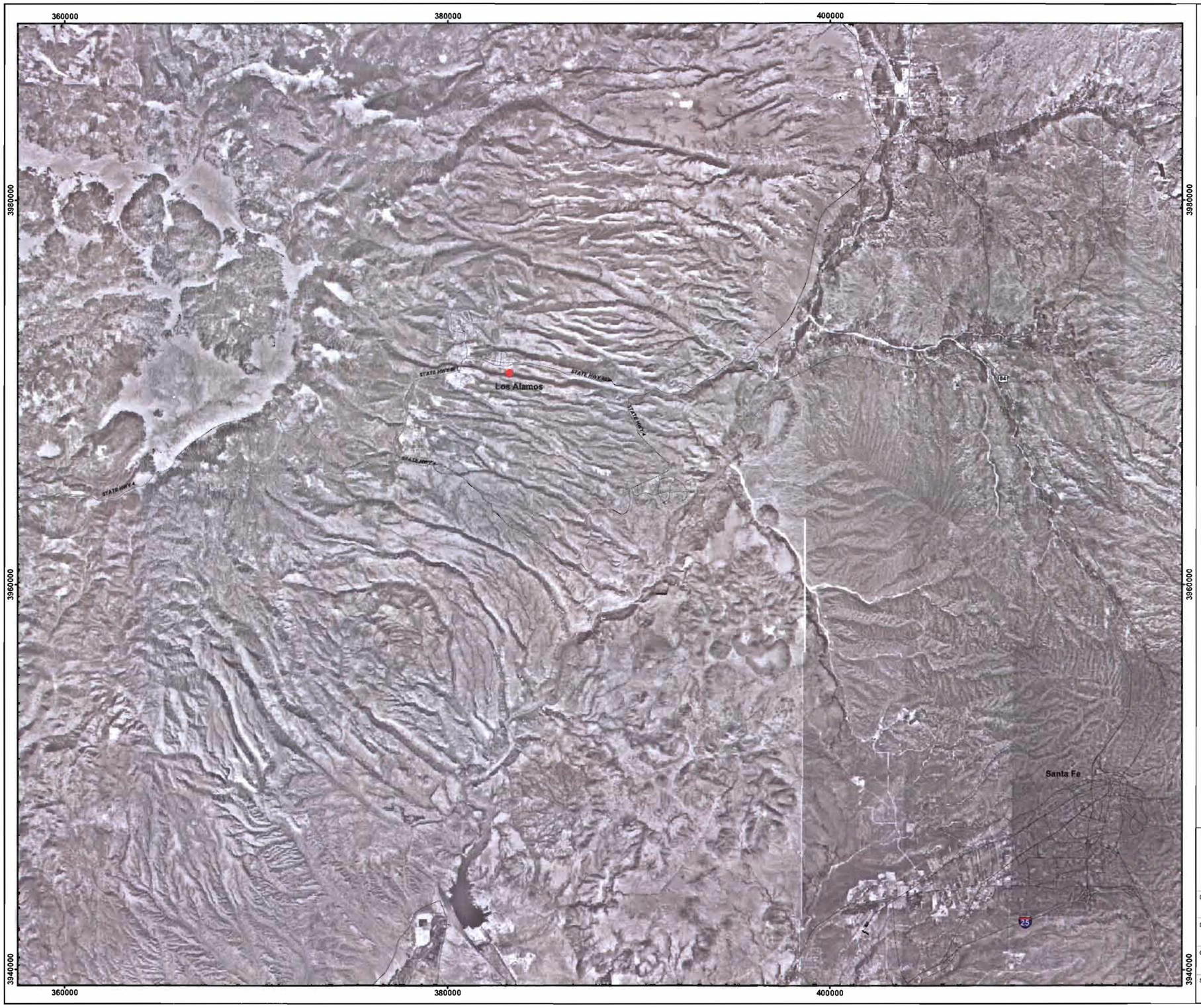
PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	**Site Location**		
DRAWN BY: BT			
CHECKED BY: GV	SCALE: As Shown	PROJECT NUMBER: 744653.85123	
SUBMITTED BY: DS	DATE: December 2009	PAGE NUMBER:	
	FILE: X:\GIS\Site_Inspections_sw\Maps\los_alamos\Fig1.mxd		

Figure 2

Site Location
Los Alamos
FUDS Project No. K06NM004201

Los Alamos County, New Mexico



Legend

- Approximate Site Location

Image: Orthophoto, 1991-1997
Projection: UTM Zone 13 NAD83, Map Units in Meters

N

3 1.5 0 3 Kilometers

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

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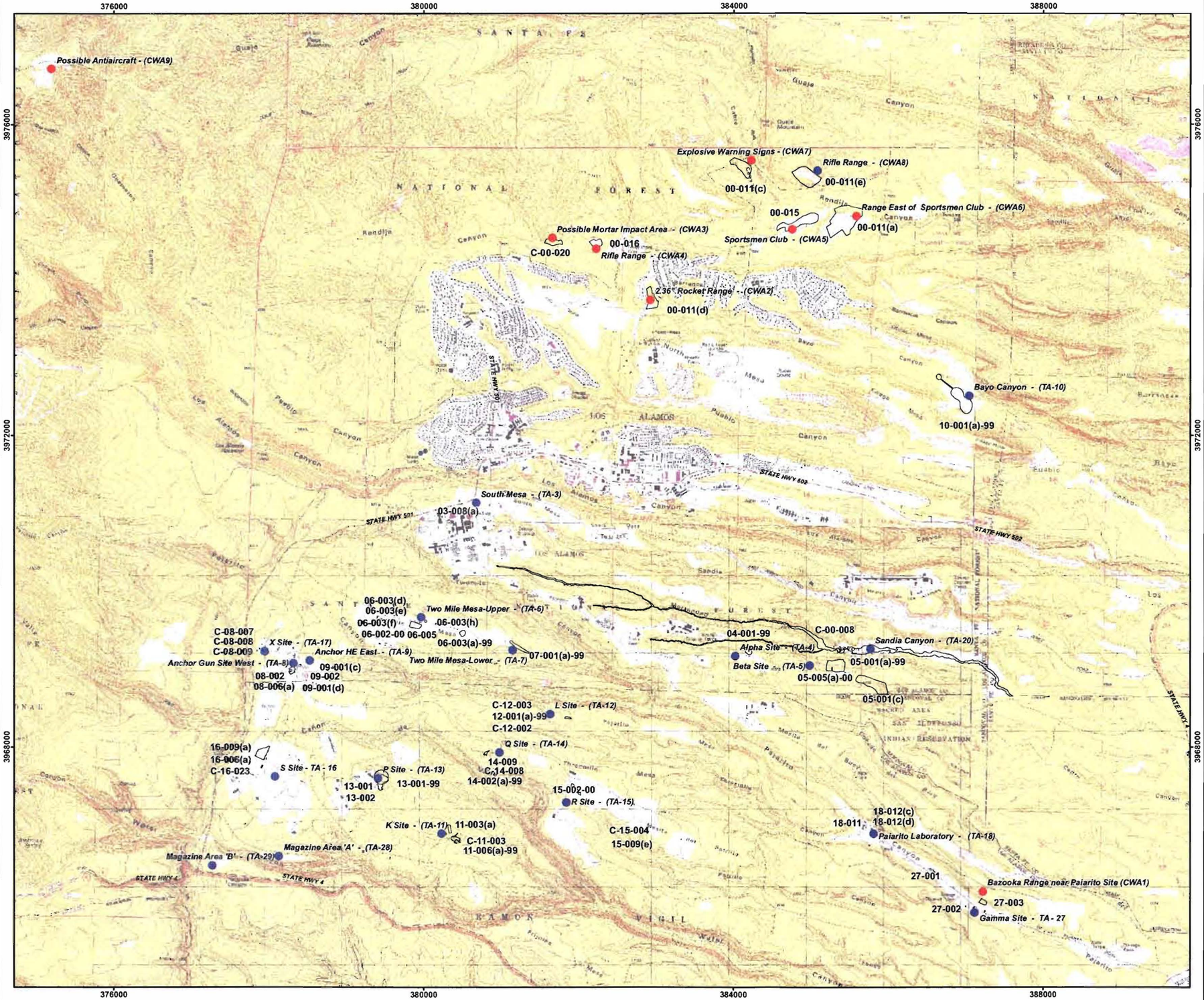
SUBMITTED BY: DS	DATE: December 2009	PAGE NUMBER:	
	FILE: X:\GIS\Site_inspections_sw\Maps\los_alamos\Fig2.mxd		

Figure 3A

Qualitative Reconnaissance Map
Los Alamos
FUDS Project No. K06NM004201

Los Alamos County, New Mexico



Legend

- CWA = Conventional Weapons Area (e.g. Rifle Range CWA4)
- TA = Technical Area (e.g. P Site - TA-13)
- SWMU/AOC

N

Image Source: USGS 7.5' Topo Quadrangles, Date Unknown
Projection: UTM Zone 13 NAD83, Map Units in Meters

1,000 500 0 1,000 Meters

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	Qualitative Reconnaissance Map	
DRAWN BY: BT	SCALE: As Shown	PROJECT NUMBER: 744653.85123
CHECKED BY: GV	DATE: December 2009	PAGE NUMBER:
SUBMITTED BY: DS	FILE: X:\GIS\Site_inspections_sw\Maps\los_alamos\Fig3a.mxd	

Figure 3B

Qualitative Reconnaissance Map
Los Alamos
FUDS Project No. K06NM004201

Los Alamos County, New Mexico

Legend

- CWA = Conventional Weapons Area (e.g. Rifle Range CWA4)
- TA = Technical Area (e.g. P Site - TA-13)
- SWMU/AOC

N

Image: Orthophoto, 1991-1997
Projection: UTM Zone 13 NAD83, Map Units in Meters

1,000 500 0 1,000 Meters

PARSONS	U.S. ARMY SOUTH PACIFIC DIVISION RANGE SUPPORT CENTER

DESIGNED BY: BT	Qualitative Reconnaissance Map		
DRAWN BY: BT			
CHECKED BY: GV	SCALE: As Shown		PROJECT NUMBER: 744653.85123
SUBMITTED BY: DS	DATE: December 2009		PAGE NUMBER:
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