Response to the "Approval with Modifications, Phase II Investigation Work Plan for Consolidated Unit 21-016(a)-99, Material Disposal Area T, at Technical Area 21, Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-06-017," Dated June 7, 2007

INTRODUCTION

This submittal is the response by Los Alamos National Laboratory (LANL or the Laboratory) to the "Approval with Modifications for the Phase II Investigation Work Plan for Material Disposal Area T at Technical Area 21, Solid Waste Management Unit 21-016(a)-99, Los Alamos National Laboratory, EPA ID #NM0890010515, HWB-LANL-06-017," issued by the New Mexico Environment Department (NMED) Hazardous Waste Bureau on April 9, 2007 (NMED 2007, 095725), and received by LANL on April 10, 2007 (NMED 2007, 095725). The Phase II investigation work plan for Material Disposal Area (MDA) T was submitted by LANL to NMED on February 15, 2007 (LANL 2007, 095131). To facilitate review of this response, NMED's comments are included verbatim. LANL's responses follow each NMED comment.

This response contains data on radioactive materials, including source, special nuclear, and by-product material. Information on radioactive materials and radionuclides, including the results of sampling and analysis of radioactive constituents, is voluntarily provided to NMED in accordance with U.S. Department of Energy (DOE) policy.

COMMENTS

NMED Comment

1. *In required action #2, NMED states that "the data set evaluated for human health risk under the construction worker scenario in the vicinity of building 21-257 significantly exceeds (greater that 25 times) DOE's target dose limit of 15 mrem/yr." NMED required the Permittees to provide "the human health risk assessment and cite appropriate references regarding the precautions that will be taken during D&D to protect constructions workers from receiving unacceptable dose in the Phase II Investigation Report." The Permittees did not respond completely to the comment.*

   In the response, the Permittees state that "[t]he risk assessment addresses potential exposure that may occur following completion of corrective actions. Decontamination and decommissioning (D&D) activities will be conducted prior to corrective actions at MDA T and the DP Aggregate and, therefore, are not considered in the risk assessment." NMED considers the risk assessment a tool to determine the presence of contamination at which a site poses an unacceptable risk for a receptor. The potential risk is present (in the case of the construction worker scenario) whether or not D&D activities occur. At MDA T, the construction worker scenario was evaluated to determine the risk to a receptor that was exposed to contamination to a depth of 10 feet. This would likely include a D&D worker. NMED requested information on how the Permittees are going to manage the risk at a site currently on its hazardous waste permit. NMED requires information on exposure to the construction worker as a direct result from a release of contamination to the soil and tuff at this site related to the SWMU rather than the potential contamination from the building itself.

LANL Response

1. LANL would like to clarify that the reference DOE target dose limit of 15 mrem/year is applied as a decision tool in assessing whether a site would be potentially acceptable for unrestricted public use and is not used as a benchmark in assessing the acceptable protection of DOE radiation workers in the discharge of their duties.

   Many work locations at LANL commonly pose the potential for radiological doses far exceeding 15 mrem/year. Regulations for worker radiological protection at these sites are identified in 10 CFR 835, Occupational Radiation Protection. The rules in this part establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities. Per 10 CFR 835, a radiation worker's total effective dose equivalent (TEDE) must be managed to less than 5000 mrem/yr. LANL has prepared a Radiation Protection Program (RPP) that is tailored to LANL operations and is compliant with requirements in 10 CFR 835. The RPP has been approved by DOE and is implemented through Implementation Support Document (ISD) 121-1.0, Radiation Protection. LANL has instituted an Administrative Control Limit (ACL) of 2000 mrem/yr TEDE to aid in the reduction of worker doses.

   Specific actions to protect workers are described in the RPP and ISD include, but are not limited to, worker training, hazard assessment, bioassay and dosimetry programs, radiation monitoring, respiratory protection, and emergency response. All personnel with field responsibilities (laborers, operators, technical staff, etc.) at MDA T shall be designated as radiation workers as defined in 10 CFR 835 and receive Radiation Worker II training before field activities begin. The RPP and ISD requirements will be administered by professional health physics staff and LANL-trained radiological control technicians (RCTs). In all cases, worker doses will be managed to as low as reasonably achievable (ALARA) levels.

NMED Comment

2. *In required action #3, NMED directed the Permittees to "remove the slough from the boreholes and collect pore-gas samples from the [total depth], similar to the additional work performed at MDAs U and V." As stated in the approved work plan, the Permittees were to collect one pore-gas sample at a depth nearest to the disposal unit and one at the total depth of the borehole. The Permittees were to collect the samples twice. The Permittees did not collect the second round of samples from the total depth because of the slough.*

   In their response, the Permittees have proposed to install a single pore gas monitoring well at location 21-25262 and plug and abandon all boreholes remaining open. The Permittees must remove the slough from all three pore-gas sampling locations (21-25262, 21-25263, and 21-25264) and install permanent pore-gas monitoring wells. Prior to completion, the Permittees must submit a long-term vapor monitoring and sampling work plan pursuant to Section IV.C.2.e.vi of the Consent Order. The lack of data prohibits NMED from determining if the extent of contamination has been determined and from making any remedy decisions following the corrective measures evaluation.

LANL Response

2. LANL has reviewed all of the volatile organic compound (VOC) and tritium borehole data for MDA T and agrees that permanent vapor-monitoring wells are needed at MDA T as part of the monitoring requirements at Technical Area (TA) 21. Accordingly, LANL agrees to remove the slough and install three permanent vapor-monitoring wells in the three deepest boreholes (sample locations 21-25262,

21-25263, and 21-25264). Within 45 days of DOE approval of the new scope, LANL will submit to NMED a long-term vapor monitoring and sampling work plan as specified in the March 1, 2005, Compliance Order on Consent (the Consent Order). Each of the three vapor wells will be sampled quarterly for a period of 1 yr, after which the need for additional sampling (such as biannually) will be evaluated. Vapor samples will be collected from the depths proposed in the Phase II work plan and analyzed for VOCs and tritium. The tritium pore gas measurements are inconclusive with respect to the trend of tritium with depth in the subsurface of MDA T. Tritium is evaluated for the human health screening assessment based on dose pursuant to the applicable DOE Orders 5400.5 and 435.1. MDA T is a key component in evaluating TA-21, and permanent vapor-monitoring wells are part of LANL's overall strategy to understand the nature and extent of contaminant releases from solid waste management units and areas of concern on the mesa top. Additional data from the three new vapor wells are needed as part of a larger monitoring program that will facilitate decision-making during the corrective measures evaluation.

NMED Comment

3. *In required action #7, NMED directed the resampling of certain boreholes to determine the vertical extent of americium-241. In their response, the Permittees state that the extent of americium-241 is defined with nearby deep boreholes. NMED disagrees with this statement for four of the eight locations.*

   The first three locations (21-02547, 21-25609 and 21-02610) are not defined by the deep borehole 21-25262 because these three boreholes are located within a small area that contains several SWMUs and AOCs and 21-25262 is located outside of this area. These SWMUs and AOCs consisted of underground storage tanks, manholes, an aboveground storage tank, and other tanks, as described in the "TA-21 Operable Unit RFI Work Plan for ER." According to the "MDA T Historical Investigation Report," these SWMUs and AOCs were the location of detected contamination during drilling in 1994. Americium-241 was detected in a sample collected from a 5-10 foot interval. Because it is not clear that the detected contamination is attributable to the bottom of the sampling interval (e.g., contamination at 5 feet or 10 feet) and the vertical extent of contamination in this small area has not been defined, the Permittees must drill an additional borehole close to 21-02547. The Permittees must collect a sample from the 8-10 foot interval and additional samples at deeper intervals in the tuff until the extent of contamination is defined. In order to define the extent of contamination, the Permittees should analyze these samples for americium-241, plutonium-238, plutonium-239, and strontium-90.

   Contamination at the fourth location (21-02541) is not defined by locations 21-02540 and 21-25358. Americium-241 and plutonium-239 were detected at elevated concentrations in borehole 21-02451 at 10-12.5 feet. The sample collected from borehole 21-02540 was collected from 7.5-10 feet. The samples collected from borehole 21-25358 were collected at 6.8-7 feet and 38-40 feet, respectively. Also, the concentrations of several constituents (americium-241, cesium-137, plutonium-238, plutonium-239, strontium-90 and tritium) increase with depth in borehole 21-02541. To adequately determine extent of contamination, the Permittees should have collected samples starting at 12.5 feet at these locations. The Permittees must adequately define vertical extent of contamination in this borehole by collecting a sample starting below the 12.5-foot interval and additional samples at deeper intervals until extent is defined. The Permittees should analyze these samples for americium-241, cesium-137, plutnium-238, plutonium-239, strontium-90, and tritium.

LANL Response

3. The nature and extent of americium-241 have been defined in all eight of the boreholes. The nature and extent for americium-241 at the first three sampling locations (21-02547, location 21-02609 [not 21-25609], and 21-02610) (Figures 1 and 2) are defined, because deep borehole 21-25262 is 380 ft deep and approximately 12 ft away horizontally from the other three locations. Any deeper contamination from the three sampling locations would have been intercepted by sampling at 21-25262. Only very low radionuclide concentrations were detected. The nature and extent of americium-241 at the fourth location (21-02541) have also been determined at locations 21-02540 and 21-25358 because borehole 21-25358 is 40 ft deep and is approximately 12 ft away horizontally from the other two locations. Any deeper contamination from the two sampling locations would have been intercepted by sampling at location 21-25358. Only very low tritium concentrations were detected in that borehole. The two new figures included with this response clarify these relationships.

NMED Comment

4. The Permittees must submit the Phase II Investigation report following completion of the field activities discussed in the "work description" column for comment #1 of the Work Plan no later than November 15, 2007.

LANL Response

4. The November 15, 2007, date for submitting the Phase II investigation report was selected before LANL could provide input concerning LANL's overall strategy for collecting additional data on the TA-21 mesa top. With the installation of two additional permanent vapor-monitoring wells and the collection of vapor samples for 1 yr (4 quarters) starting in July, LANL proposes a new date for submitting the Phase II investigation report. The proposed submittal date is July 18, 2008, 60 days after the fourth quarter of vapor sampling. Any additional vapor-monitoring data collected after 1 yr will be submitted as addendums to the investigation report. A schedule outlining this process is provided (Figure 3).

REFERENCES

The following list includes all documents cited in this response. Parenthetical information following each reference provides the author(s), publication date, and ER ID number. This information is also included in text citations. ER ID numbers are assigned by the Environmental Programs Directorate's Records Processing Facility (RPF) and are used to locate the document at the RPF and, where applicable, in the master reference set.

Copies of the master reference set are maintained at the NMED Hazardous Waste Bureau; the DOE-Los Alamos Site Office; the EPA, Region 6; and the Directorate. The set was developed to insure that the administrative authority has all material needed to review this document, and it is updated with every document submitted to the administrative authority. Documents previously submitted to the administrative authority are not included.

LANL (Los Alamos National Laboratory), February 15, 2007. "Phase II Investigation Work Plan for Consolidated Unit 21-016(a)-99, Material Disposal Area T, at Technical Area 21, Los Alamos National Laboratory" Los Alamos National Laboratory document LA-UR-07-0930, Los Alamos, New Mexico. (LANL 2007, 095131)

NMED (New Mexico Environment Department), April 9, 2007. “Approval with Modifications, Phase II Investigation Work Plan for Consolidated Unit 21-016(a)-99, Material Disposal Area T, at Technical Area 21,” New Mexico Environment Department letter to D. Gregory (DOE LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED HWB), Santa Fe, New Mexico. (NMED 2007, 095725)

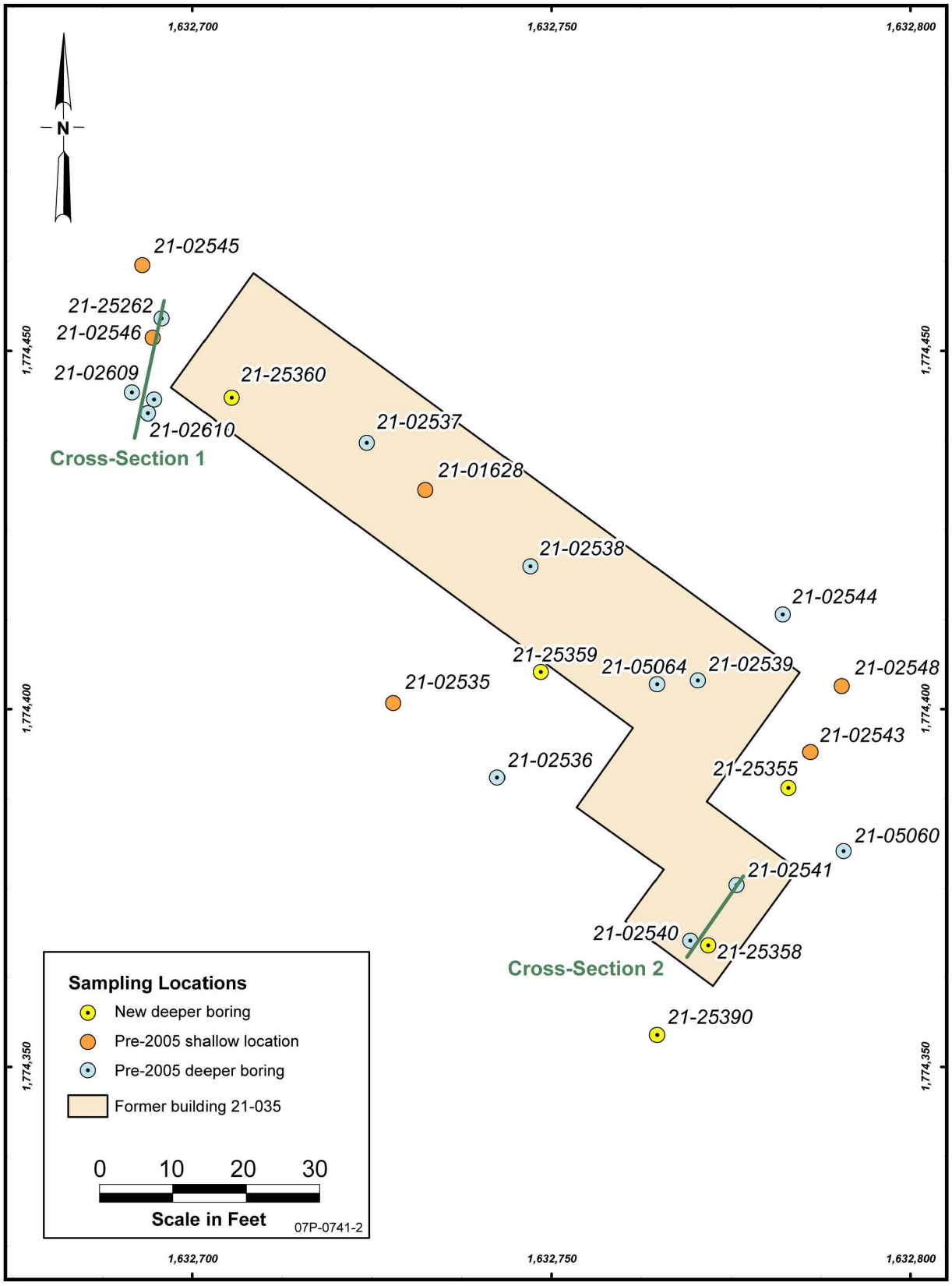

Figure 1 Plan view showing borings and transect lines around former building 21-035

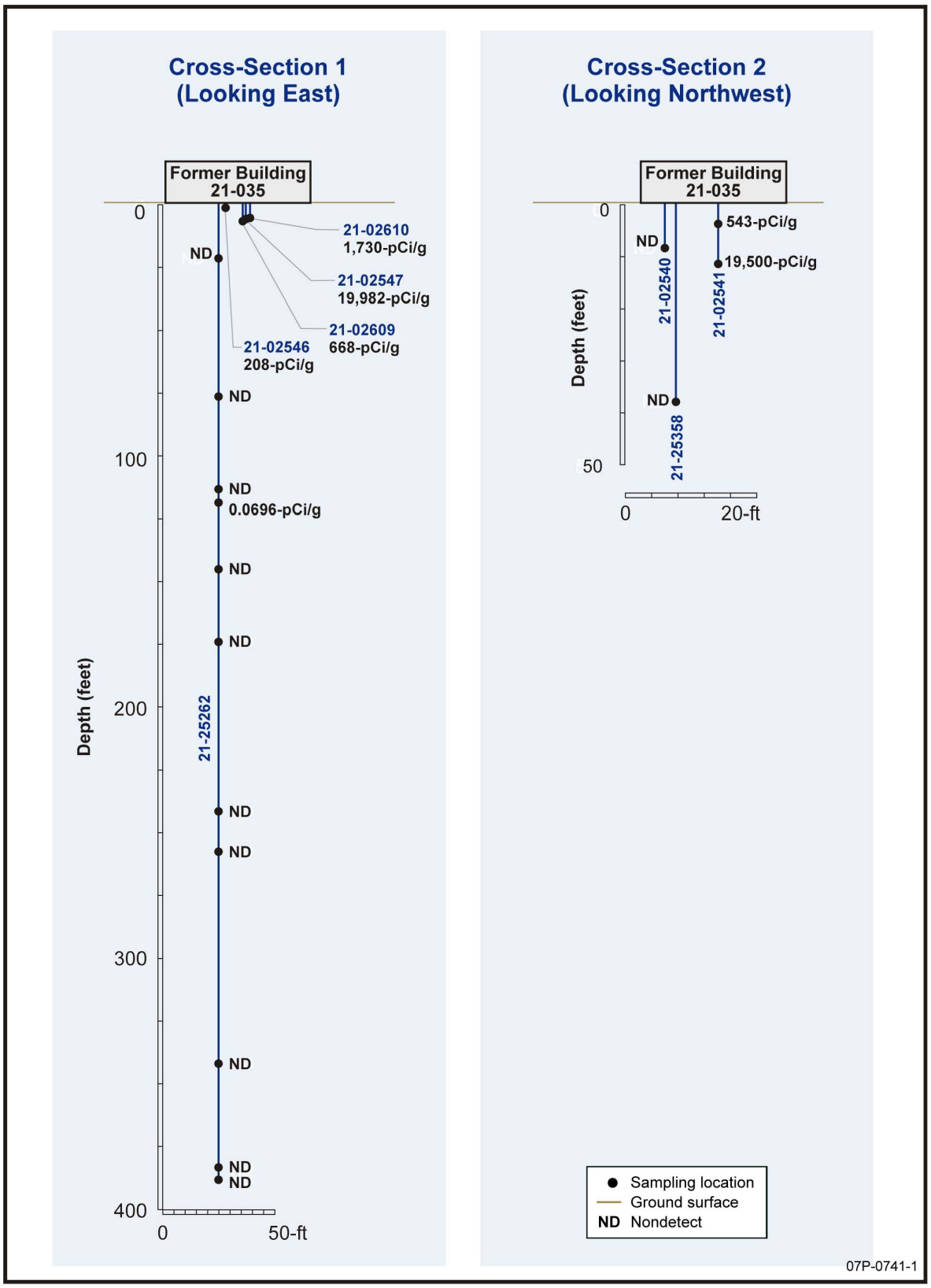

Figure 2 **Cross-section showing northern and southern group borehole samples for americium-241 (pCi/g)**

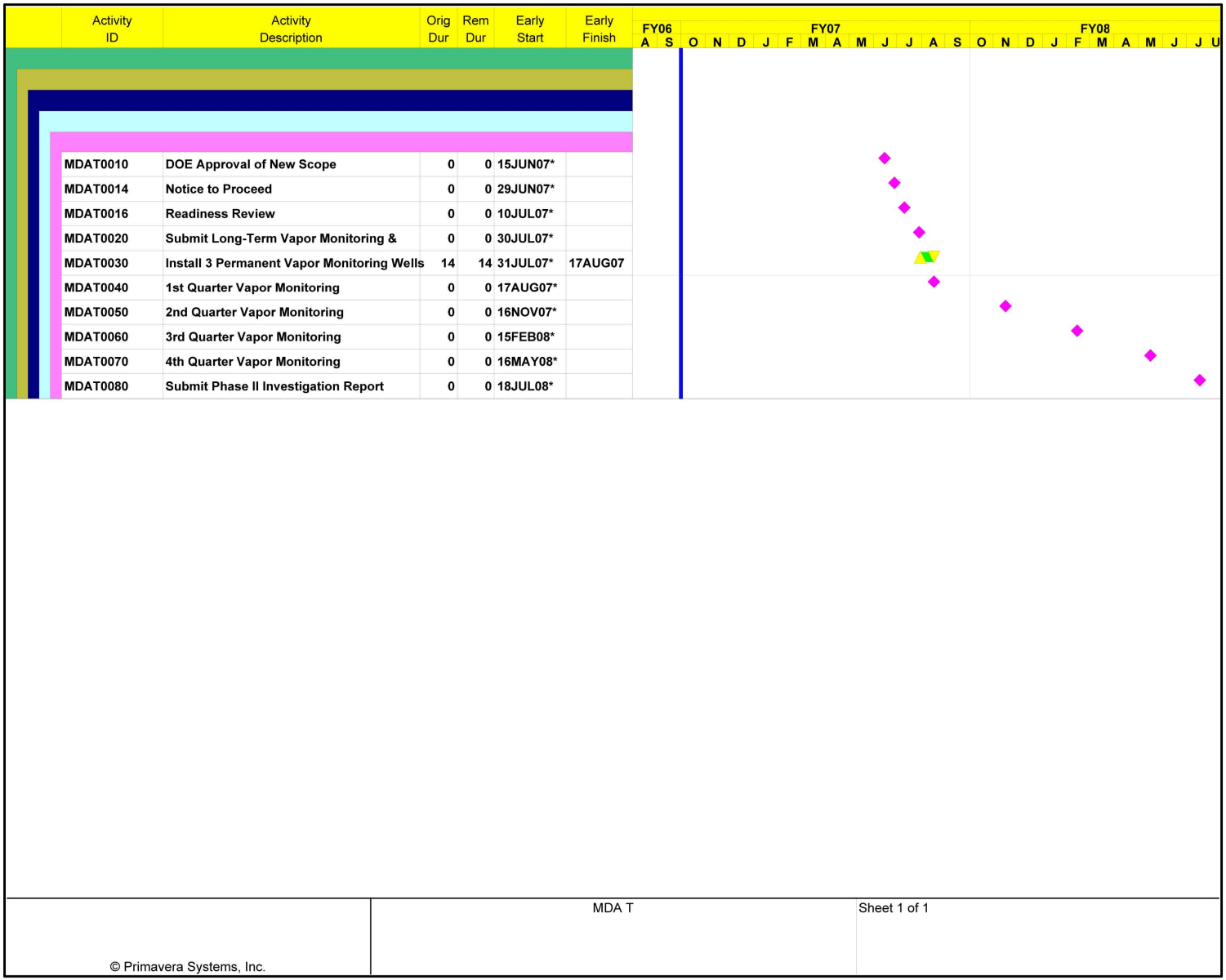

Figure 3 Schedule of field activities at MDA T