ERID-524579

September 2013

FIELD IMPLEMENTATION PLAN FOR INTERMEDIATE WELL R-63i

Prepared by TPMC for the Environmental Programs Directorate

Field Implementation Plan for Intermediate Well R-63i

September 2013

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ACRONYM LIST

APS	Accelerator Porosity Sonde
ASTM	American Society for Testing and Materials
bgs	Below ground surface
CD	Compact disc
CMR	Combinable Magnetic Resonance
DOE	Department of Energy
EES	Earth & Environment Science Division
EP (ADEP)	Environmental Programs Directorate
EP-WES	Environmental Programs Waste and Environmental Services
ER-SOP	Environment and Remediation Standard Operating Procedure
ES&H	Environment, Safety and Health
FMI	Formation Microimager
ft	Feet
FTL	Field Team Leader
FOD	Facility Operations Director
gal	Gallons
ID	Inside diameter
IDW	Investigation Derived Waste
in	inch
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security
MDA	Material Disposal Area
NMED	New Mexico Environment Department
NTU	Nephelometric turbidity units
OD	Outside diameter
OM	Operations Manager
PIC	Person in charge
PM	Project manager
ppm	Parts per million
PVC	Polyvinyl chloride
RCT	Radiological control technician
RLM	Responsible Line Manager
RP-1/ RP-3	Radiological protection group(s)
SMO	Sample management office
SOM	Shift Operations Manager

SOW	Statement of Work
STR	Subcontract Technical Representative
SWPPP	Storm Water Pollution Prevention Plan
TA	Technical Area
TD	Total Depth
TOC	Total organic carbon
TPMC	TerranearPMC
WCSF	Waste Characterization Strategy Form

1.0 INTRODUCTION

1.1 Background

TerranearPMC has been contracted to install a perched intermediate monitoring well by Los Alamos National Security (LANS) Environmental Programs (EP) Directorate. The perched intermediate well (designated as R-63i) will be located within Los Alamos National Laboratory (LANL) Technical Area (TA) 16 in Los Alamos County, New Mexico (Figure 1). All work will be performed under the statement of work (SOW) and in accordance with the Compliance Order on Consent (March 2005, revised 2008) between the New Mexico Environment Department (NMED) and the United States Department of Energy (DOE)/LANL, and the Drilling Work Plan for Well R-63i (LA-UR-13-20150).

Well R-63i will be installed as part of the Environmental Programs Material Disposal Area (MDA) P (TA-16) monitoring network. The R-63i well will be installed at a depth of approximately 1200 feet (ft) below ground surface (bgs). R-63i will be drilled deep enough to collect representative samples from the perched groundwater identified approximately 55 ft above the regional aquifer during the drilling of well R-63. Well R-63i is tentatively designed with one well screen set between 1095 to 1125 ft bgs within Puye Formation deposits. Final well design will be determined based on conditions found during drilling and geophysical logging and will incorporate discussions with NMED.

This Drilling Plan provides guidance for drilling, sampling, borehole geophysics, well installation, well development, aquifer testing, and sampling system installation. Project staff, health and safety, waste management, security, schedules, and required permits are also discussed in this document.

1.2 Objectives

The R-63i monitoring well is intended to provide hydrogeologic and groundwater quality data to achieve specific data quality objectives consistent with the Groundwater Protection Program for the Laboratory, the Compliance Order on Consent, and the NMED approved workplan. Specifically, R-63i is being installed to monitor contaminant releases from the 260 Outfall and MDA-P as well as recharge from Canon de Valle, as required by the NMED's Approval with Modifications, TA-16 Well Network Evaluation and Recommendations.

Secondary objectives are to collect drill-cutting samples, acquire borehole geophysical data, and possibly sample potential perched groundwater zones, if present.

The end-users of the data collected from this project will be LANL, DOE, NMED, and the general public.

2.0 ORGANIZATIONAL STRUCTURE

This project is being performed for LANS. The LANL Environmental Programs Drilling Subcontract Technical Representative (STR) will assist with obtaining the necessary LANL-required permits and assist with scheduling and logistical issues.

An organizational chart is presented in Table 1.

2.1 TerranearPMC Project Management Team

The TerranearPMC Management Team consists of the Program Manager, Project Manager (PM), Drilling Superintendent, Environment, Safety and Health (ES&H) Representative, and Quality Assurance (QA) Manager. The Management Team will review all task order work plans, ensure compliance with QA, ES&H plans, and perform project audits of ongoing work.

The Management Team will also provide technical assistance to the Field Team. In addition, they will provide health and safety oversight and quality control guidance for well-construction and procedure compliance.

The ES&H Representative will provide health and safety related technical assistance and senior review of all project specific safety plans. He will also conduct project site safety inspections. The TPMC and LANS Management Team key personnel and their respective roles are detailed in Table 2.

2.2 Field Team

TerranearPMC's field team personnel and their respective roles are shown in Table 2. Additional qualified staff may be added as necessary to ensure all project requirements are met. These staff will be identified and their roles assigned before work begins.

During the drilling operations, there will be two onsite TerranearPMC personnel. One geologist will be onsite full time as the Field Team Leader (FTL)/Person in Charge (PIC) and lead site geologist. The other TerranearPMC team member will assist the FTL as needed. The field geologists will maintain field notes detailing daily site activities, compile and submit daily field reports, document down-hole tools, collect samples, conduct lithologic logging, document wastes generated, and conduct daily safety meetings and equipment inspections. The FTL/PIC will be the main point of contact at the site.

Field operations will run 24-hours a day, seven days per week with two shifts (12-hours per shift) throughout the duration of the borehole drilling phase of the project. After borehole drilling is finished, it is anticipated that work shifts will be 12-hour day shifts only for the remaining tasks (i.e. well construction, well development, aquifer testing, and sampling system installation). Shift timing is yet to be determined. TerranearPMC staff will rotate shifts on a regular basis. TerranearPMC field team members will be interchangeable and their exact scheduling is expected to be flexible.

2.3 Drilling Subcontractor

Boart Longyear will be the drilling subcontractor supporting the drilling, well installation, and development of R-63i. The drilling subcontractor will be responsible for site safety, consistent and adequate sample recovery, ensuring that equipment is appropriate for the goals of the drilling project and in proper working order, and that daily drilling logs are maintained.

3.0 FIELD ACTIVITIES

Field activities will include well drilling, sample collection, down-hole geophysical characterization, well installation, well development, aquifer testing, permanent sampling system installation, and surface completion. The Drilling Work Plan for Well R-63i (LA-UR-13-20150) will be used to guide field operations and ensure all objectives are met.

3.1 Well Drilling

Drilling equipment and supplies for the completion of the project will be staged around the work site in an organized and secure manner. Surplus and/or inactive equipment and supplies may be stored at the LANL drilling project laydown yard located at the northwest corner of Pajarito Road and New Mexico State Road 4. Access to the laydown yard is through a locked gate. The STR, FTL, and drilling foreman will control the gate keys.

3.1.1 Mobilization

Mobilization will consist of transporting and setting up equipment at the location. Mobilization will include the following:

- Mobilize drill rig, trailers, support vehicles, drilling tools and materials, and well construction materials to the drill site.
- Stage alternative drilling tools and construction materials at the laydown yard.
- Entrance radiological screening of all equipment and tooling by RP-1.
- Set up drill rig, trailers, support vehicles and tools at the location. Figure 2 presents a typical drilling site layout.
- Review scope of work and project-specific health and safety issues with crew.
- Complete all required training for all personnel.
- Obtain Facility Operations Director (FOD) Work Authorization, including rig inspection and Integrated Work Document (IWD) review.

The R-63i site will be accessed from TA-16 Access Control. The water source for the project has been identified as a fire hydrant near the Burning Ground.

3.1.2 Drilling Methods

The STR will be notified in writing approximately 24 hours prior to commencement of drilling activities. The R-63i borehole will be drilled with a Foremost DR-24HD drilling rig. Specifications for this machine may be found at Foremost's website (http://www.foremostmobile.com/index.php). At least two auxiliary air compressors will be utilized along with the rig's deck compressor. A Pulstar P-100k pump hoist will be used to build and develop the monitoring well.

The R-63i borehole will be initiated by setting a removable 24-inch conductor casing into competent tuff at an approximate depth of 40 to 60 ft bgs. Dual rotary methods will be used to set the conductor casing. The 24-inch casing will be removed with the drill rig upon completion of drilling activities.

A 19 to 22-inch open hole will then be drilled to below the bottom of the first intermediated perched groundwater interval at approximately 870 ft bgs, or as far as reliable open hole drilling conditions will allow. If an open hole is able to be achieved to the total depth of this section, a temporary 20 ft bentonite seal will be installed in the bottom of the open borehole before installing 18-inch drill casing. If an open hole is not achieved, 18-inch drill casing will be installed and advanced using dual rotary methods to the total depth of this section. The 18-inch casing will then be retracted 20 ft while placing bentonite in the bottom of the borehole. In either case, the 18-inch

casing will then be advanced through the bentonite seal and 5 to 10 ft deeper than the bottom of the borehole and bentonite seal. Advancing the 18-inch casing into native formation will yield a secondary mechanical seal and provide sufficient depth to cut off the drive shoe without compromising the bentonite seal above.

Preserving an option to set a well screen in the upper (first) intermediate perched interval requires special consideration. If it should be determined that the R-63i monitoring well will be screened in the upper intermediate perched interval, it will require extended service from the drill rig. While the 18-inch casing's drive shoe will be cut off before continuing with drilling activities, the casing will need to be cut again, higher up in the section above the top of the seal in order to prevent smearing of the screen interval with bentonite upon casing extraction. Cutting the 18-inch casing anywhere other than below the seal during drilling is not advised. If the upper perched interval is selected for screening, the drill rig will be needed to make the casing cut, but not before the smaller casing strings (discussed below) have been removed from the borehole.

A string of 16-inch casing will then be installed and advanced using dual rotary methods to approximately 1120 ft bgs. The 16-inch casing will penetrate the second and third possible intermediate perched intervals. A temporary bentonite seal will be installed at the bottom 20 ft of the 16-inch casing string. The 16-inch casing will be retracted 20 ft while placing bentonite in the bottom of the borehole and readvanced in order to accomplish the seal installation. The 16-inch casing will be advanced to a depth just below the seal in order to cut off the drive shoe without compromising the seal.

The borehole will be completed to total depth using 12-inch casing and dual rotary drilling methods. The fourth possible intermediate perched zone will be the primary target for the well screen interval and is expected to be encountered at 1178 ft bgs. The total depth (TD) of the borehole is expected to be 1200 ft bgs. Depending upon saturation thickness, the 12-inch casing will be advanced to a depth greater than the bottom of the filter sand interval so that the drive shoe can be cut off and isolated in bentonite during well construction.

Figure 3 presents the anticipated geology and intermediate perched groundwater intervals.

3.1.3 Proposed Alternative Drilling Methods

Drilling conditions may require converting to alternative methods. Consultation with the LANL STR will precede any deviations from the above referenced drilling methods. Conventional dual-rotary and casing advance will be the primary drilling methods employed at the R-63i borehole.

3.1.4 Drilling Additives

Potable water from a municipal source will be used to cool the drilling tools, help evacuate cuttings from the borehole and suppress dust from the discharge of dry returns. Filtered compressed air will be the primary circulation 'fluid' for returning cuttings to the surface. Descriptions of potential drilling foaming agents are as follows.

- AQF-2®: Added at a rate of 0.5 to 2.0% by volume. AQF-2 is an anionic surfactant that is added to fresh water for air/foam, air/gel-foam, or mist drilling applications. AQF-2 is the newest foaming agent in the Baroid line and is the preferred foaming agent for environmental drilling applications.

- Quik Foam®: Added at a rate of 0.5 to 1.0% by volume. Quik Foam provides the surfactant necessary for foam formation.

Complete records will be maintained detailing the type, amount, and volume of drilling fluid used and the depths at which drilling fluid is added to the borehole. No drilling fluids, except potable municipal water, will be used within 100 ft of the first perched aquifer at 809 ft bgs. If the target aquifer cannot be reached without the addition of drilling fluids, the situation will be discussed with LANL and NMED.

Portland Type I/II cement with either no aggregate or a small amount of sand may be used for sealing perched groundwater intervals or managing unstable borehole conditions, if encountered. Hydrated bentonite chips may be used for sealing perched groundwater intervals. The LANL STR will be contacted for approval before any perched groundwater zone is sealed off.

3.1.5 Decontamination

Decontamination of the drill rig and tools will be performed by hot water/steam pressure washing before arriving onsite prior to the start of drilling activities and before leaving the site. Decontamination water will be containerized in 55-gallon drums, properly labeled and stored onsite. Decontamination of sample tools will be performed with a wire brush followed by spraying with Fantastik® and wiping clean with paper towels. Bailers will be washed with LiquiNox® detergent and potable water and rinsed prior to sample collection.

3.1.6 Demobilization

Demobilization activities will include:

- Final decontamination and screening for radioactivity by RP-1 of the drill rig, tools, and support equipment.
- Loading and removal of the drilling tools, including alternative tools, from the site.
- Removal of the drill rig and support vehicles from the site.
- Staging and securing of investigation derived wastes (IDW) for future disposition.
- Removal of municipal waste (e.g. materials packaging).
- Final site cleanup.

The LANL STR will inspect the site prior to final demobilization of the drill crew. Final demobilization of the drill crew will not be permitted until the condition of the site is acceptable to the STR.

3.2 Groundwater Detection

Perched water is expected at this location based on drilling observations at well R-63. The observed depths of groundwater were 809-852, 994-1014, 1074-1094, and 1178-1200 ft bgs. The STR will be notified within approximately 100 ft of target aquifer depth of 809 ft bgs. Review of fluids used to date and a check of systems for remaining drilling to reach 1200 ft bgs will be conducted.

The primary indicator for perched water will be driller's observations. If the driller notes any indication of groundwater, drilling will stop, the drilling tools will be removed from the borehole and the presence of water will be verified using a water level meter. Alternatively, if the drill tools employed allow, the presence of water may be verified through the tooling without removal from

the borehole. If water exists in the borehole the tools will either be pulled from the borehole or remain out of the hole to allow the field team to check for accumulation of water in the borehole.

Groundwater screening samples will not be collected during drilling. The LANL STR will be notified within four hours of perched groundwater detection or by 10 AM of the following day if the detection was made during the night shift.

3.3 Sample Collection Procedures

All samples will be collect by the TPMC field team and transported to the SMO and/or LANL Earth and Environmental Sciences Division (EES) Geomaterials and Geochemistry Research Laboratory (GGRL), as appropriate. A 'samples collected' table will be maintained electronically and submitted to the STR at the conclusion of each phase of the project.

3.3.1 Groundwater Screening and Groundwater Characterization Sample Collection

Sample collection and handling procedures will be conducted in accordance with TPMC procedures equivalent to ENV-DO-306, SOP-5057, and SOP-5058 (LANL 2001b, LANL 2000, LANL 2002). See Table 3 for analytical suites, container size, and preservation.

A groundwater screening sample will be collected for RDX analysis at the first water encountered, at an anticipated depth of 800 ft bgs regardless of drilling methodology (i.e. open hole or casing advance). Subsequent groundwater screen samples will be collected for RDX analysis after each 20 ft section of borehole advancement (i.e. after each section of drill rod and casing has been advanced). The screening samples will be collected upon start-up of the following piece of casing advancement after establishing circulation and after unloading whatever column of water may exist in the bottom of the borehole.

Samples will be collected from the well screen interval at the end of well development and during aquifer pump testing. Development and aquifer testing samples will be analyzed for total organic carbon (TOC) only by GGRL.

Groundwater characterization samples will be collected from the completed well between 10 and 60 days after well development in accordance with the Consent Order. The samples will be analyzed for the full suite of TA-16–related constituents, including tritium; metals/cations; general inorganic chemicals; volatile organic compounds; semivolatile organic compounds; high explosive compounds, including hexahydro-1,3,5-trinitro-1,3,5-triazine and related degradation products; as well as stable isotopes. This sampling event will be performed by others and is not a part of this field implementation plan.

3.3.2 Cuttings Samples

Cuttings will be collected from the discharge line at 5-ft intervals. The cuttings will be examined to determine lithologic characteristics and will be used to prepare lithologic logs. Portions of the cuttings will be wet sieved (using #10 and #35 mesh) and placed in chip trays along with unsieved cuttings. The sieved fractions in chip trays will be submitted to the LANL archive. Lost circulation zones with no cuttings returns will be indicated by empty chip trays and cuttings-loss markers (core boxes) labeled 'no returns'. The remaining bulk cuttings will be sealed in Ziploc® bags, labeled, and archived in core boxes. The core boxes and chip trays will be delivered to the LANL archive at the conclusion of drilling activities. A summary of cuttings sampling is presented in Table 4.

3.4 Down-Hole Geophysics

The R-63i borehole may be logged with LANL-owned geophysical tools as requested during drilling. It is anticipated that LANL geophysical runs will be coordinated with specific drilling targets (e.g. upon reaching TD or before hanging a casing string in an open portion of the borehole). Additionally, the LANL-owned down-hole video camera may be used to evaluate and remedy adverse conditions.

Subcontract geophysical logging may be performed in the R-63i borehole by Schlumberger Water Services. If requested, Schlumberger will log the entire borehole after TD is reached. The following cased-hole Schlumberger geophysical suite may be run in the R-63i borehole:

- Natural and Spectral Gamma Logs
- Elemental Capture Sonde (ECS)
- Accelerator Porosity Sonde (APS)
- Triple Litho Density

In the event that the borehole is open, the following open-hole Schlumberger geophysical suite will be performed:

- Natural and Spectral Gamma Logs
- Accelerator Porosity Sonde (APS)
- Formation Microimager (FMI); can only be operated below the water table
- Array Induction
- Combinable Magnetic Resonance (CMR)

The logs will be used to characterize the hydraulic properties of saturated rocks within the aquifer and to help select the well screen interval. The geophysical logging operation will consist of one mobilization after reaching the total depth for R-63i. Personnel from RP-3 will perform radiological screening and documentation of Schlumberger's down-hole radioactive source tool(s) upon arrival and prior to departure. If logging is conducted in an open hole, no radioactive sources will be used; however, RP-3 will be notified. A TPMC field crewmember will be present during logging operations to oversee logging runs and calibration checks.

Schlumberger will process the geophysical logs and provide a preliminary interpretation within 24 hours of completion. Five copies of the raw field geophysical logs and a compact disc (CD) containing the field logs (in .las format) will be provided to LANL immediately after completion of logging. Final logs, electronic files, and montages will be provided in the well completion report.

The drilling subcontractor shall assist in hanging a sheave from the rig mast or tophead for wireline access to the borehole during all geophysical logging operations.

3.5 Well Installation and Completion

One well screen is tentatively designed to be placed between 1095 to 1125 ft bgs within Puye Formation. Data from screening samples and the lithologic, geophysical, and video logs will be

used to determine the exact placement of the screened interval of the well. The well will be designed in accordance with TPMC's procedure equivalent to LANL ER SOP-5032. LANL will provide an approved well design to TPMC prior to the start of well installation. Final well design will be based on data review and discussions between TPMC, EP, DOE and NMED.

The total well screen length and well construction details will be based upon site-specific conditions and will be approved by the LANL STR in writing before the start of well construction. NMED will approve the design prior to well construction.

3.5.1 Well Construction

The well will be constructed of 5.0-in. inside diameter (ID)/ 5.56-in outside diameter (OD), type A304, passivated stainless steel casing fabricated to ASTM A312 standards provided by LANS. The screened interval of the well will consist of nominal 11-ft length(s) of 5.3-in OD, 0.020-in slot, rod-based wire wrapped well screen. Each well screen segment has an effective screen length of 10 ft. Stainless-steel casing will be installed below the bottom-most well screen to provide up to a 20 ft sump with a threaded end cap. External couplings, also of type A304 stainless steel fabricated to ASTM A312 standards, will be used to connect individual casing and screen joints. All well screen and casing will be thoroughly washed/ decontaminated before use and wrapped in plastic if staged after washing. Centralizers will be placed 2-ft above and below the well screen. A secure cap will be welded or threaded onto the top of the well casing to prevent backfill materials from entering the well during construction.

A tremie pipe will be used during well construction to gravity feed the annular fill materials. The bottom of the borehole will be tagged at the beginning of well installation and bentonite chips will be placed from the bottom of the borehole to within 5 ft of the bottom of the screened interval. The well shall be supported from the top at all times during construction. Drill casing will be extracted with hydraulic casing jacks and rings/slips. The drill casing will be removed in 20 ft sections and staged onsite for removal after well construction is completed.

The primary filter pack of the screened interval will consist of 10/20 sand and will be placed approximately 5 ft above and below the screened interval. The primary filter pack material and interval will be based on site-specific data. After placement, the screened interval will be swabbed to promote settling and compaction of the primary filter pack. A two to five foot thick collar of finer-grained (20/40) sand will be placed above the primary filter pack.

A bentonite seal consisting of 100 percent bentonite chips or uncoated pellets will be placed above the fine sand collar. Potable water will be used to transport the materials down-hole.

Backfill material will consist of bentonite chips to fill the borehole annulus to within 100 ft of the ground surface. Neat cement, or other approved mix, will be used to fill the remainder of the borehole annulus. The depth to annular material will be measured periodically to determine that the materials are settling properly.

The STR will be notified approximately 24 hours prior to well casing installation and backfilling of borehole/annulus.

3.5.2 Well Development

Development of R-63i will begin no sooner than 24-hrs after the well has been cemented to approximately 3-ft bgs. The primary objective of well development is to develop the filter pack and remove suspended sediment from the well until water turbidity is less than 5 nephelometric

turbidity units (NTUs) for three consecutive samples collected at 30-minute intervals. Additional water quality parameters to be measured during development include pH, temperature, specific conductance, dissolved oxygen, and total organic carbon (TOC). If the turbidity standard is not attainable, an alternate standard of stabilization of pH, temperature, conductivity, and a TOC level of less than 2.0 parts per million (ppm) must be achieved before termination of development procedures. Water will be collected daily in 40-ml septum vials and transferred to the LANL EES-14 laboratory for analysis. Samples will be submitted unfiltered and without preservatives.

Development of the well will begin by bailing and swabbing the screened intervals and sump to remove any backfill and/or formation materials that have been introduced into the well during drilling and well construction and clean the filter pack. Bailing will continue until water clarity visibly improves.

The screened interval will be swabbed using a surge block to enhance filter pack development. The surge block will consist of a 4.75-in. OD, 1-in. thick nylon (or similar) disc attached to a weighted static rod operated on a wireline. The swabbing tool will be lowered into the well and drawn repeatedly across the screened interval for approximately 1 hour. Water turbidity will not be measured during the bailing and swabbing process.

A 4-in. diameter submersible pump with an appropriately sized pump motor will be used for the final stage of the well development. The submersible pump used during development will be a larger unit, capable of moving larger volumes (20+ gallons per minute), than the pump to be installed for the dedicated sampling system. The pump intake will be set at multiple depths within the screened intervals and in the sump to remove as much suspended sediment as possible until the desired results (parameters) are achieved.

The use of chemical well development may be discussed with LANL and NMED if water quality parameters cannot be achieved. No chemicals will be added without LANL and NMED's approval.

The STR will be notified approximately 24 hours prior to the completion of well development.

3.5.3 Aquifer Testing

Aquifer pump testing will be considered at R-63i if a sufficiently robust zone within the aquifer is encountered. The most likely test will be a 24hr constant-rate pumping test. The aquifer test will be designed and implemented at the direction of David Schafer and Associates.

3.5.4 Sampling System Installation

A Sampling System Design Package will be prepared for LANL's approval before proceeding with sampling system installation.

A dedicated sampling system consisting of an environmentally retrofitted 4-in, Grundfos® submersible pump with a 4-in, 3-phase, 460-volt, Viton fitted Franklin® submersible motor will be installed in the well. The pump size (horsepower) will be specified after well screen interval specific capacity observations are made during well development and aquifer testing.

All materials that contact the groundwater will be constructed of stainless steel, Teflon, Viton, or polyvinyl chloride (PVC). All components of the pump column will be new. The pump column will be constructed of 1-in threaded/coupled passivated stainless steel pipe. The exact composition and pedigree of the 1-in. stainless pump column will be documented in the field logbook, in the sample system receipt inspection, and in the final well completion report. A weep hole or weep

valve will be installed at the bottom of the uppermost pipe joint to protect the pump column from freezing. To measure water levels in the well, two 1-in. ID, flush-threaded, schedule 80 PVC tubes will be installed to sufficient depth to set a dedicated transducer and to collect manual water levels. The PVC transducer tubes will be equipped with 9-in sections of 0.010 in. slot screen with threaded end caps at the bottom of the tubes. A vented In-Situ® Level Troll 500 transducer will be set in one of the PVC tubes. A LANL-standardized weather-resistant pump control box will be installed next to the wellhead.

The sampling system will conform to the specifications found in the LANL ADEP E&T Wells Update and the Surface Completion Details for Intermediate and Regional Wells drawing package.

The STR will be notified approximately 24 hours prior to sampling system installation.

3.5.5 Surface Completion

The wellhead surface completion will include a 16-in. steel outer protective casing to protect the stainless steel monitoring well. The protective casing will extend to approximately 3-ft bgs. The wellhead completion will be a 'stick-up' with an overall height of the protective casing, including riser cap, of 3-ft, 6-in. (42-in. above concrete pad surface). The stainless steel well casing will have an overall height of 2-ft, 6-in. (30-in. above concrete pad surface). A weep hole will be installed to prevent water build-up inside the protective casing. The top of the protective casing will be fitted with a LANL supplied tamper-proof well cover plate and will be set in a 10-ft by 10-ft by 9-in.-thick reinforced concrete pad. A 10 ft long x 0.75 in. copper clad steel grounding rod will be installed in the concrete pad. A brass survey monument, imprinted with well identification information, will be placed in the northwest corner of the pad. A total of four bollards, painted yellow for visibility, will be set at the outside edges of the pad to protect the well from traffic. All four bollards will be designed for easy removal to allow access to the well.

The surface completion will conform to the specifications found in the LANL ADEP E&T Wells Update and the Surface Completion Details for Intermediate and Regional Wells drawing package.

Southwest Mountain Surveys, a New Mexico licensed professional land surveyor, will survey the well location and elevation. Survey points will include: ground surface elevation near the concrete pad, the top of the brass pin in the concrete pad, the top of the well casing, and the top of the protective casing. The accuracy of the survey data will be in accordance with NMED Regulations and LANL procedure. Survey data will be supplied to the LANL STR and will also be provided in the completion report.

3.6 Investigation Derived Waste

All IDW generated during implementation of this work plan will be managed in accordance with applicable Environmental Programs–Waste and Environmental Services (EP-WES) and Environmental Protection Water Quality and Resource Conservation Recovery Group (ENV-RCRA) SOPs. These SOPs incorporate the requirements of all applicable U.S. Environmental Protection Agency (EPA) and NMED regulations, DOE orders, and Laboratory requirements. Documents applicable to the characterization and management of IDW are the following:

- SOP-10021, Characterization and Management of Environmental Program Waste (http://int.lanl.gov/environment/all/docs/qa/ep_qa/ SOP-5238.pdf);

- the NMED-approved Notice of Intent (NOI) Decision Tree for Drilling, Development, Rehabilitation, and Sampling Purge Water; and
- the NMED-approved NOI decision Tree for IDW Solids from Construction of Wells and Boreholes.

A Waste Characterization Strategy Form (WCSF) will be prepared by LANS in accordance with SOP-10021 and will provide more detailed information on waste descriptions, quantities, handling, and disposition. All wastes generated during the R-63i project will be managed according to the WCSF.

Table 1
R-63i Project Organizational Chart

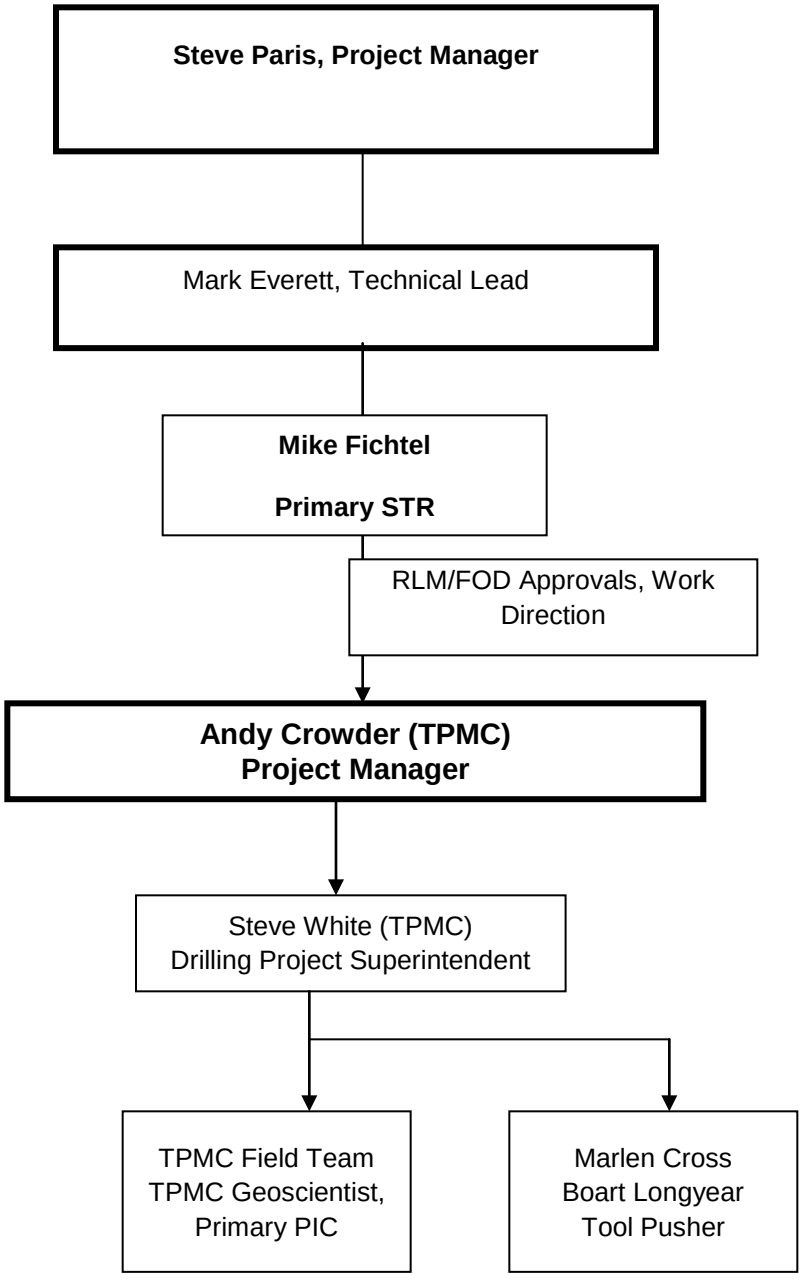

Table 2
Key Team Personnel Roles and Responsibilities

Name	Role	Responsibilities
Andy Crowder	Project Manager, Alternate Person in Charge (PIC)	Project management, budget, resource commitments, and LANS interaction
Steve White	Drilling Superintendent, Principal Field Team Leader (FTL), Alternate PIC	Project and field management, LANS interaction, geology, and subcontractor coordination
Robert Brounstein	ES&H Professional	IWD and Health and Safety compliance
Al Whiteaker	Quality Assurance Manager	Quality assurance management oversight
Gary Stoopes	Environmental Professional	Regulatory compliance
Jim Jordan	Field Geologist, FTL/ Alternate PIC	Field management, geology, and subcontractor coordination
Ryan McGuill	Field Geologist, FTL/ Alternate PIC	Field management, geology, and subcontractor coordination
Travis Naibert	Field Geologist, FTL/ Alternate PIC	Field management, geology, and subcontractor coordination
Zoe Duran	Waste Team Leader	Supervise field waste personnel
Robert Stadeli	Boart Longyear Drilling Supervisor	Project and technical management oversight of drilling operations
Marlen Cross	Boart Longyear Tool Pusher	Project and technical management oversight of drilling operations

Table 2 (Continued)
Key Team Personnel Roles and Responsibilities

Name	Role	Responsibilities
Steve Paris	Project Manager	Responsible to the Program Director for the successful execution of the project.
Mike Alexander	Facility Ops Director (FOD)	Facility Operations and Security Management/Coordination; When delegated authorizes and approves project work
Mark Everett	Drilling Project Technical Lead	Project leadership for overall drilling projects planning, coordination, oversight, execution and closeout for this project
Terry Forrester	Procurement Specialist, (PS)	Responsible for solicitation, negotiation, award, and administration of subcontracts and has overall commercial responsibility for respective subcontracts; designated authority to direct subcontractor
Mike Fichtel, Primary STR	Primary Point-of-Contact (POC), Subcontract Technical Representative (STR)	Responsible to the Project Manager for monitoring and documenting the subcontractor's day-to-day performance, providing day-to-day oversight, assuring work is performed in a safe manner. STR is the single Point-of-Contact for interaction between LANS and Subcontractor.

Table 3
Analytical Suites, Sample Containers, Sample Volume, and Preferred Laboratories for Groundwater Collection from Well R-63i

Analytical Suite	Sample Container	Sample Volume	Preferred Laboratory
Groundwater Screening Samples			
Metals/cations (dissolved)	poly	1.0 L	EES-14*
Anions (dissolved, (including perchlorate)	poly	1.0 L	EES-14
Tritium (H3)	Amber glass	1.0 L	TBD
Total Organic Carbon (TOC)	Amber glass	40 ml	EES-14
RDX**	TBD	TBD	EES-14
Sampling System EQB* **			
VOCs****	Amber glass	40 ml	TBD
SVOCs*****	Amber glass	1.0 L	TBD

Notes:

* EES-14: LANL Earth and Environmental Sciences-Hydrology, Geochemistry and Geology Group.

** RDX: Research Department Expolosive

*** EQB: equipment blank.

**** VOC: volatile organic compound(s).

***** SVOC: semivolatile organic compound(s)

Table 4
R-63i Sample Collection Activities for Drill Cuttings

Sample Description	Test	Sample Size	Container	Sample Frequency
Cuttings	Bulk cuttings systematically collected for archival purposes and for supplemental sample needs	500-700 ml	Plastic Ziploc™ bags	One sample every 5-ft.
Cuttings	Sieved cuttings for lithologic description and binocular microscope examination	Enough to partly fill trays	Plastic chip trays	One sample every cutting run (nominally every 5-ft.) Normally, an unseived sample, >10 mesh sample, and a >35 mesh sample every cuttings run.

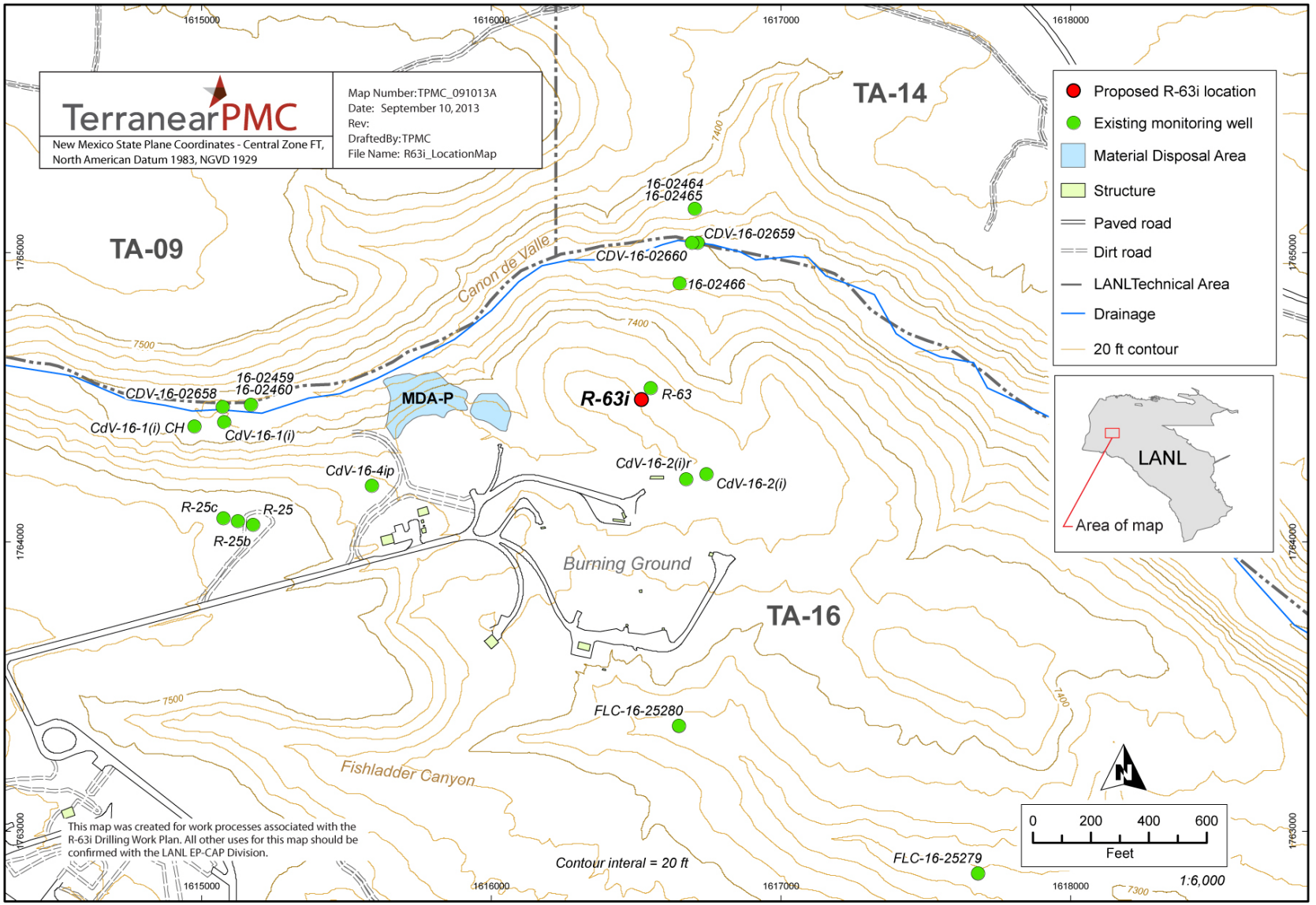

Figure 1 Proposed location of Intermediate Monitoring Well R-63i

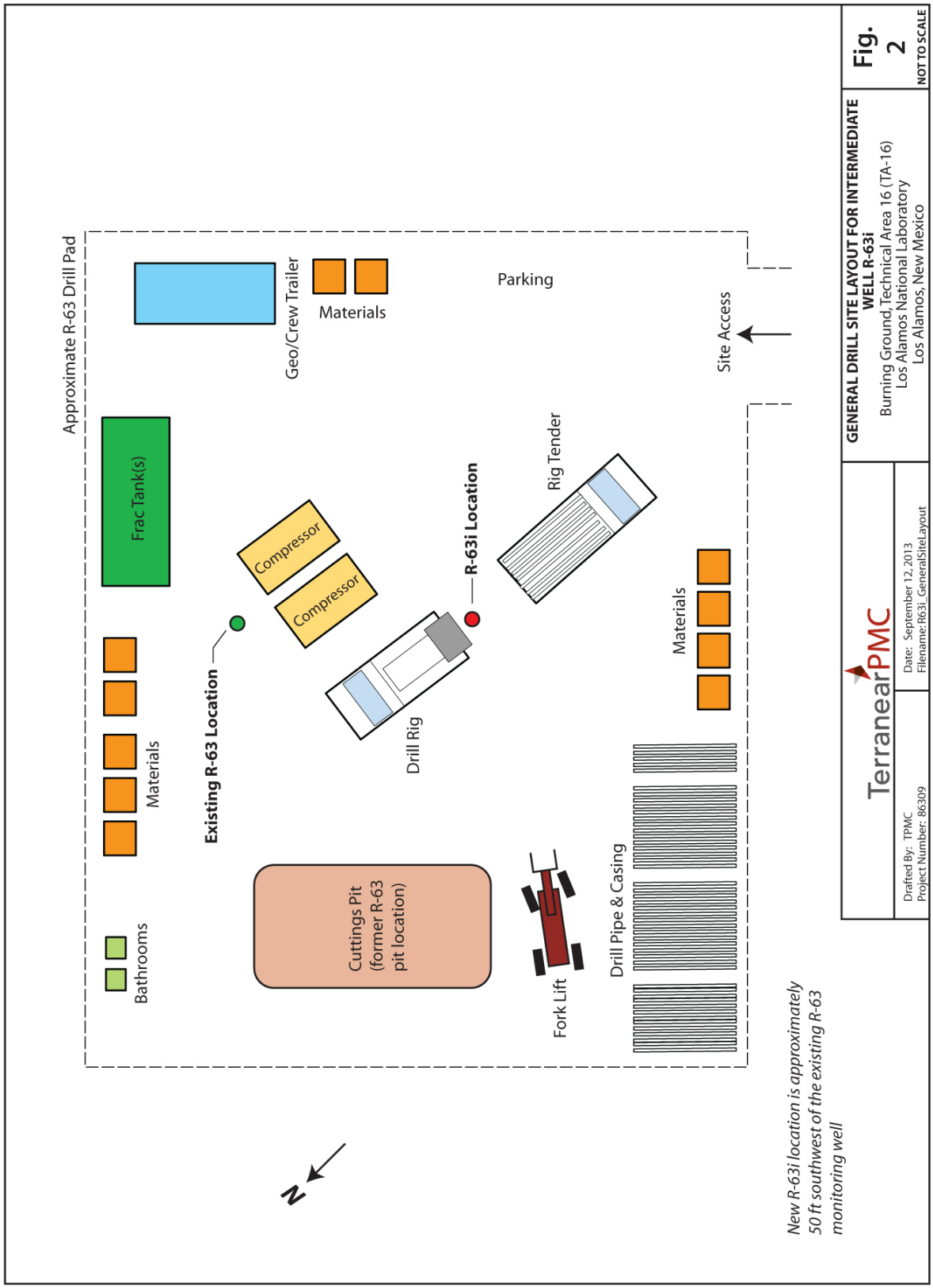

Figure 2 General Drill Site Layout for Intermediate Monitoring Well R-63i

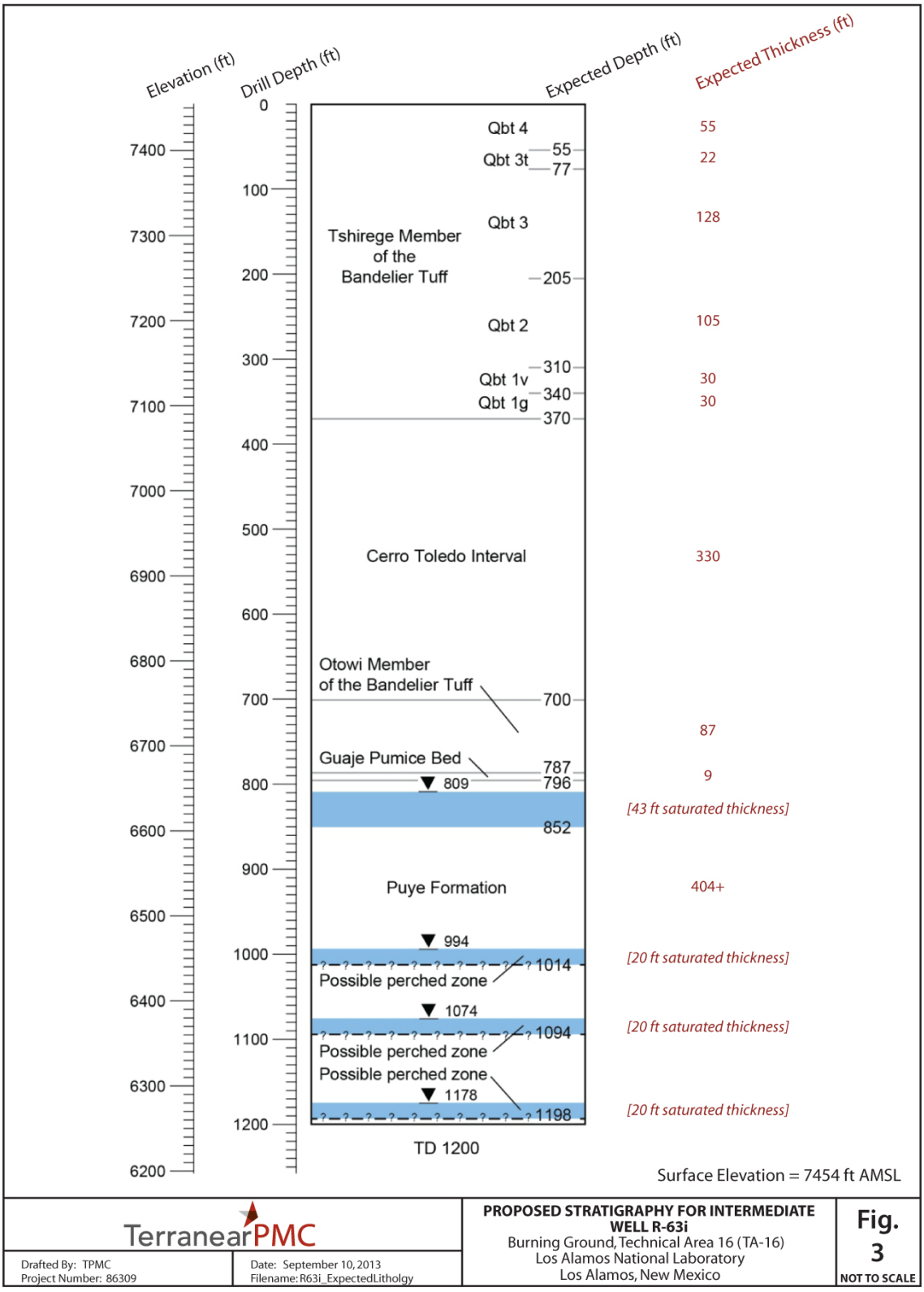

Figure 3 Predicted stratigraphy for Intermediate Monitoring Well R-63i

From:	ep-scc@lanl.gov
To:	CSSS@sharepoint2010.lanl.gov
Cc:	Guffee, Debi; Stephens, Kevin E
Subject:	TPMC_Contract_Num_86309_009_13,_Submittal_Num_5.017, ID-6
Date:	Monday, September 30, 2013 4:34:16 PM
Attachments:	R-63i_Drilling_Plan_FINAL_Rev0.pdf R-63i_Drilling_Plan_FINAL_Rev0_MRA.pdf

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ADEP-CSSS Notification

This email is your notification that the review for a document submitted by TPMC for contract 86309_009_13 is complete and was assigned the Review Status Code identified below. Custodian, please take appropriate action based on the Review Status Code assigned. This submittal document has been sent to ADEP Records Management System.

REVIEW STATUS CODE: 2 - Reviewed - Revise and resubmit. Work may proceed subject to incorporation of comments

Submittal Number: 5.017
Submittal Description: Field Work Plan
Title: Field Implementation Plan for Intermediate Well R-63i

Reviewer Comments:

Everett, Mark C (Review Complete) 9/19/2013 8:37 AM - 9/23/2013 8:22 AM
(Everett, Mark C) Top of page 6 still says no screening samples will be collected while drilling. The whole sentence needs to be removed.
Pearson, Steven G (Review Complete) 9/19/2013 8:37 AM - 9/30/2013 4:27 PM
(Pearson, Steven G)
Fichtel, Michael D (Review Complete) 9/19/2013 8:37 AM - 9/23/2013 12:30 PM
(Fichtel, Michael D) No comments.
McCann, John P (Review Complete) 9/19/2013 8:37 AM - 9/19/2013 8:39 AM
(McCann, John P) no comments
Paris, Steven M (Review Complete) 9/19/2013 8:37 AM - 9/23/2013 9:47 AM
(Paris, Steven M) I will not be reviewing or providing comments.
Alexander, Mike (Review Complete) 9/19/2013 8:37 AM - 9/24/2013 10:51 AM
(Alexander, Mike) Comments provided in FIP for R2A2 for LANS folks
Maze, Steve (Review Complete) 9/19/2013 8:37 AM - 9/24/2013 10:35 AM
(Maze, Steve) No Comments

For technical questions about CSSS, contact adep_edms@lanl.gov.
Contact the appropriate STR for other questions.