Work Plan to Plug and Abandon Well R-25

Primary Purpose	Regional aquifer well R-25 is being plugged and abandoned to meet a requirement set forth in the New Mexico Environment Department (NMED) Hazardous Waste Bureau's approval with modifications letter for the Technical Area 16 Network Evaluation and Recommendations report (NMED 2012, 520747). This work plan summarizes the plugging and abandonment methods Los Alamos National Laboratory (LANL) proposes for well R-25, located on the south rim of Cañon de Valle within Technical Area 16 (TA-16), near LANL's southwestern boundary. Well abandonment will be consistent with the requirements in Section X.D, Well Abandonment, of the Compliance Order on Consent (the Consent Order), and New Mexico Office of the State Engineer (NMOSE) regulations. A plugging plan will be submitted to NMOSE for approval before well abandonment, and a plugging record will be submitted to NMED after work is completed.
Construction	The R-25 borehole was advanced to a depth of 1942 ft and completed as a nine-screen stainless-steel monitoring well (Broxton et al. 2002, 072640). The as-built well-completion drawing for well R-25 is shown in Figure 1. The well was drilled from 1999 to 2000 by Dynatec Environmental Drilling Company using a Foremost dual rotary (DR-24) drill rig. The well was constructed of schedule 40 304 stainless-steel riser with 10-slot rod-based wire-wrapped screens. The annular space outside each screen was filled with 20/40 silica sand. An interval of 30/70 sand was generally placed above and below each screen's sand pack, except where tremie difficulties were encountered. Each screened interval was isolated from the others with bentonite seals in the annular space between the outer casing and borehole wall. The annular seals were a 50:50 mix by weight of 20/40 sand and granular bentonite and were placed via the tremie method. All drill casing was removed from the borehole during well construction, except for a 70-ft section of 13 3/8-in.-diameter drill casing that was abandoned in place from 508 to 578 ft below ground surface (bgs). The tremie pipe was also abandoned in place in the annular space of the well during construction activities; the geophysics log could not accurately locate the tremie pipe, but drilling notes document the loss occurred during backfilling above screen 4. Screens 3 and 9 were damaged during well construction. Screen 3 was repaired and screen 9 was abandoned, except for use as a water-level collection point. Details of the disposition are shown in Figure 1.
Abandonment Methods	Abandonment activities will include steps to remove the Westbay casing string, packers (26), and ports (43) from the stainless-steel well casing, followed by selective perforation of the casing intervals above and below screens 1 through 8 (Table 1). The proposed intervals are presented in Figure 1. Following borehole video logging to ensure the location and quality of the casing perforations, the well will be pressure grouted from total depth to surface with a neat cement grout using a packer or grout shoe. The grout will be placed in lifts, with only one to two screened intervals grouted per lift.
Surface Completion	The existing concrete pad will be left intact and the well and protective casing cut flush with the top of the existing well pad. Concrete will be placed from 2 ft bgs to the top of pad elevation to complete the backfilling of the well. A surveyed brass cap already exists in the 5- × 10-ft pad that is to be left in place.
Waste Disposal	A waste characterization strategy form (WCSF) will be prepared to guide disposal of any wastes generated during abandonment. Materials removed from the borehole will be reused or recycled, if possible. Nonrecyclable materials will be disposed of in accordance with the WCSF.

Summary Report	A brief report summarizing abandonment activities will be prepared for NMED, and a plugging record will be prepared for NMOSE detailing the abandonment methods and the quantities of backfill materials used. A location map and abandonment schematic will also be included in both reports.
Schedule	Well R-25 will be a valuable monitoring point for the tracer study, proposed in the Work Plan for a Tracer Test at Consolidated Unit 16-021(c)-99 (LANL 2012, 210352), which is scheduled to begin by May 30, 2013. Plugging and abandonment activities at R-25 will not begin until sufficient tracer study data have been collected at R-25 or 1 yr after the study begins, whichever comes first. Therefore, LANL proposes to plug and abandon well R-25 by June 30, 2014. A field summary report, required under Section IV.B.1.b.v of the Consent Order, will be submitted to NMED within 90 calendar days of completion of plugging and abandonment activities.

REFERENCES

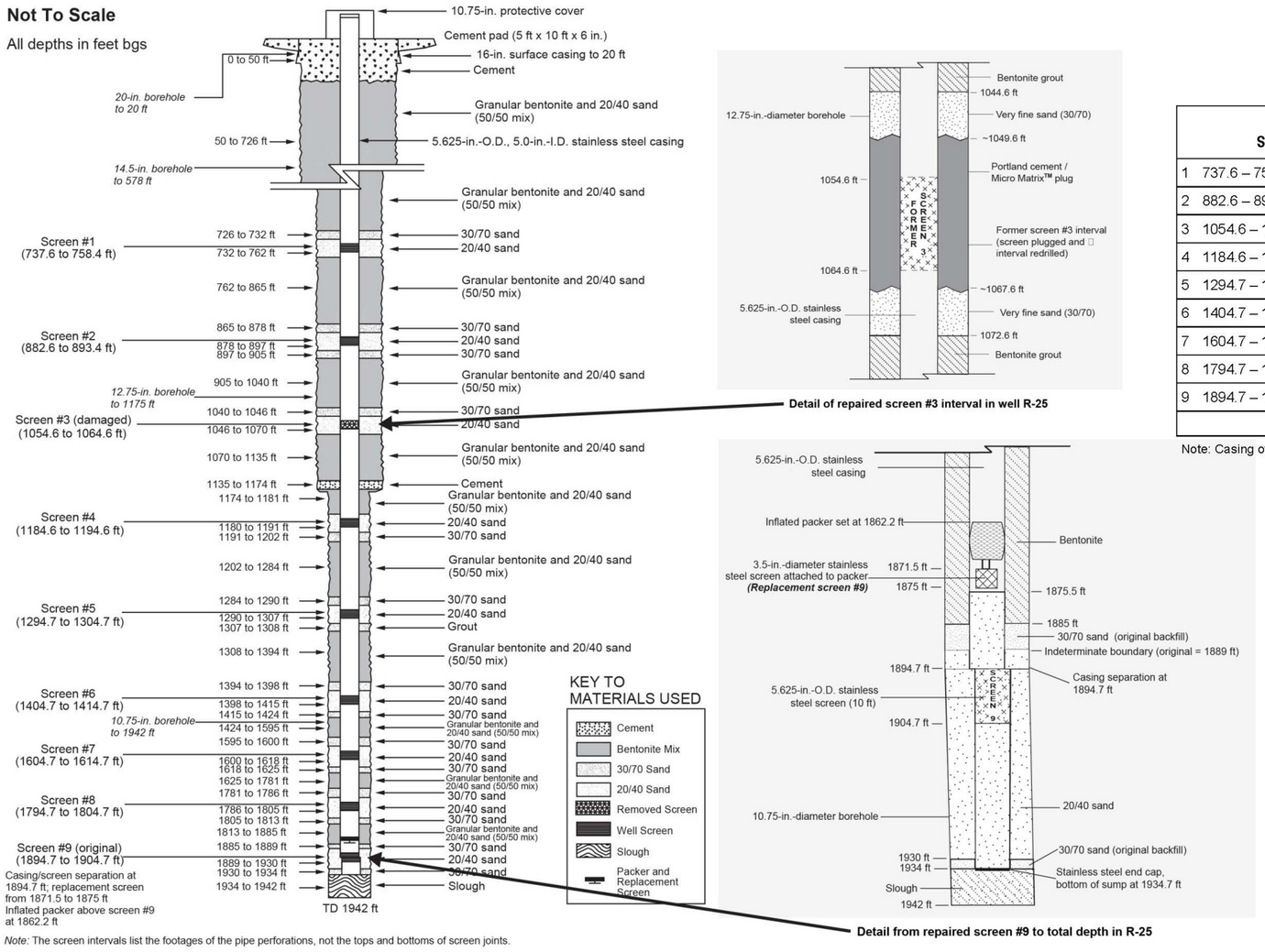
The following list includes all documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ER ID. This information is also included in text citations. ER IDs are assigned by the Environmental Programs Directorate's Records Processing 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 and the Directorate. The set was developed to ensure 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.

Broxton, D., R. Warren, P. Longmire, R. Gilkeson, S. Johnson, D. Rogers, W. Stone, B. Newman, M. Everett, D. Vaniman, S. McLin, J. Skalski, and D. Larssen, March 2002. "Characterization Well R-25 Completion Report," Los Alamos National Laboratory report LA-13909-MS, Los Alamos, New Mexico. (Broxton et al. 2002, 072640)

LANL (Los Alamos National Laboratory), January 2012. "Work Plan for a Tracer Test at Consolidated Unit 16-021(c)-99, Technical Area 16," Los Alamos National Laboratory document LA-UR-12-0440, Los Alamos, New Mexico. (LANL 2012, 210352)

NMED (New Mexico Environment Department), June 20, 2012. "Approval with Modifications, Technical Area 16 Well Network Evaluation and Recommendations," New Mexico Environment Department letter to P. Maggiore (DOE-LASO) and M.J. Graham (LANL) from J.E. Kieling (NMED-HWB), Santa Fe, New Mexico. (NMED 2012, 520747)



Note: The screen intervals list the footages of the pipe perforations, not the tops and bottoms of screen joints.

Figure 1 As-built well completion diagram for R-25

Table 1
Proposed Perforation Intervals

	Screen	Upper (ft bgs)	Lower (ft bgs)	Total (ft)
1	737.6 – 758.4	721 – 736	760 – 767	22
2	882.6 – 893.4	860 – 880	895 – 910	35
3	1054.6 – 1064.6	1035 – 1050	1067 – 1075	23
4	1184.6 – 1194.6	1176 – 1182	1196 – 1207	17
5	1294.7 – 1304.7	1279 – 1292	1307 – 1313	19
6	1404.7 – 1414.7	1389 – 1402	1417 – 1429	25
7	1604.7 – 1614.7	1590 – 1602	1617 – 1630	25
8	1794.7 – 1804.7	1776 – 1792	1807 – 1818	27
9	1894.7 – 1904.7	None	None	0
			Total	**193**

Note: Casing offset at 1894.7 ft bgs.