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AREVA

10 CFR 70.5

July 31, 2009

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AES-O-NRC-09-00092-0

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

AREVA Enrichment Services LLC
Eagle Rock Enrichment Facility
NRC Docket No: 70-7015

Subject: Supplement to Eagle Rock Enrichment Facility License Application - Groundwater Analytical Data – Winter and Spring 2009, Ecology Field Study Report - Winter and Spring 2009, and Combined Geotechnical Report, Revision 6

AREVA Enrichment Services LLC (AES) hereby submits a supplement to Revision 1 of the Eagle Rock Enrichment Facility (EREF) License Application (Reference 1) to provide the: 1) Analytical results of the additional groundwater sampling that was performed in January 2009 and April 2009, as committed to in Section 3.4.2 of the EREF Environmental Report; 2) Results of the Winter and Spring 2009 Ecology Field Studies; and 3) Update geotechnical information based on a revised Geotechnical Report. This information is provided in the form of markups to the EREF Environmental Report (Enclosure 2) and the Integrated Safety Analysis (ISA) Summary (Enclosure 3), and a copy of the Ecology Field Study Report for Winter and Spring 2009 (Enclosure 4).

The markups of the ISA Summary provided in Enclosure 3 contain security-related sensitive unclassified non-safeguards information (SUNSI). This information was identified as SUNSI by using the guidance in NRC Regulatory Issue Summary (RIS) 2005-31, "Control of Security-Related Sensitive Unclassified Non-Safeguards Information Handled by Individuals, Firms, and Entities Subject to NRC Regulation of the Use of Source, Byproduct, and Specific Nuclear Material." Enclosure 1 provides an affidavit supporting our request to withhold in accordance with 10 CFR 2.390(b).

The EREF License Application will be revised to include the markup pages of the Environmental Report and the ISA Summary as presented in Enclosures 2 and 3, respectively, in Revision 2 of the EREF License Application.

NMSS01

If you have any questions, please contact Mr. Stan Day at 508-573-6550.

Respectfully,

George Harper
Vice President of Engineering and EPC Project Manager

References:

1) S. Shakir (AES) Letter to the U.S. Nuclear Regulatory Commission, Revision 1 to License Application for the Eagle Rock Enrichment Facility, dated April 23, 2009.

Enclosures:

1) Affidavit of Sam Shakir
2) Markup pages for the EREF Environmental Report
3) Markup pages for the EREF ISA Summary
4) Ecology Field Study Report - Winter and Spring 2009

Commitments:

The EREF License Application will be revised to include the markup pages of the Environmental Report and the ISA Summary for the *Groundwater Analytical Data - Winter and Spring 2009*, the *Ecology Field Study Report - Winter and Spring 2009*, and the *Combined Geotechnical Report Revision 6*, as presented in Enclosures 2, and 3, respectively, in Revision 2 of the EREF License Application.

CC:
Breeda Reilly, U.S. NRC Senior Project Manager
Gloria Kulesa, U.S. NRC Senior Project Manager

a) I am the President and Chief Executive Officer (CEO) for the AREVA Enrichment Services LLC (AES), and as such have the responsibility of reviewing the proprietary and confidential information sought to be withheld from public disclosure in connection with our application to construct and operate a uranium enrichment facility. I am authorized to apply for the withholding of such proprietary and confidential information from public disclosure on behalf of AES.

b) I am making this affidavit in conformance with the provisions of 10 CFR 2.390 of the regulations of the Nuclear Regulatory Commission (NRC), and in conjunction with AES's request for withholding, which is accompanied by this affidavit.

c) I have knowledge of the criteria used by AES in designating information as proprietary or confidential.

d) By this submittal, AES seeks to protect from disclosure certain security-related sensitive unclassified non-safeguards information (SUNSI) contained in the markups of the Integrated Safety Analysis Summary (Enclosure 3).

   This affidavit discusses the bases for withholding certain portions of this submittal, as indicated therein, from public disclosure.

e) Pursuant to the provisions of 10 CFR 2.390(b)(4), the following is furnished for consideration by the NRC in determining whether the proprietary information sought to be protected should be withheld from public disclosure.

   1. The markups of the ISA Summary provided in Enclosure 3 contain security-related sensitive unclassified non-safeguards information (SUNSI). This information was identified as SUNSI by using the guidance in NRC Regulatory Issue Summary (RIS) 2005-31, "Control of Security-Related Sensitive Unclassified Non-Safeguards Information Handled by Individuals, Firms, and Entities Subject to NRC Regulation of the Use of Source, Byproduct, and Specific Nuclear Material."

   2. The information sought to be withheld is being provided to the NRC in confidence, and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the NRC.

   3. The information sought to be withheld is not available in public sources, to the best of AES's knowledge and belief.

For all of the reasons discussed above, AES requests that the identified proprietary information be withheld from public disclosure.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 31, 2009.

Mr. Sam Shakir
President and CEO of AES LLC
One Bethesda Center
4800 Hampden Lane
Suite 1100
Bethesda, MD 20814

JOHN KENDALL
Notary Public
Montgomery County, Maryland
My Commission Expires December 4, 2010

Notary Public

AREVA Enrichment Services LLC
Eagle Rock Enrichment Facility
AES-O-NRC-09-00092-0

ENCLOSURE 2

Markup pages for the EREF Environmental Report

ac) in Bingham County, and 6,527 ha (16,130 ac) in Jefferson County, Idaho (Bonneville County, 2008) (Jefferson County 2008) (Inside Idaho, 2008) (USCB, 2008a) The rangeland, typical of that found in southeastern Idaho, is composed of shrub and herbaceous vegetation and supports livestock grazing and wildlife.

Non-irrigated seeded pasture comprises 10% of the area within the 8-km (5-mi) radius, all 3,914 ha (9,673 ac) of which is located within Bonneville County. Non-irrigated seeded pastures are areas where native rangelands have been cleared to create improved pasture for livestock grazing.

Agricultural land comprises 18% of the area within an 8-km (5-mi) radius of the proposed site, including 5,063 ha (12,510 ac) within Bonneville County, and 1,931 ha (4,771 ac) in Jefferson County. There are no agricultural lands in Bingham County. The agricultural lands are used primarily for production of food and fiber.

Barren land, comprised of bare exposed rock and volcanic flows constitutes the other land use classification in the proposed site vicinity, is 19% of land area.

3.1.5 Special Land Use Classifications

Special land use classifications (e.g., Native American reservations, national parks, prime farmland) within the vicinity of the site include the following:

- Two Wildlife Management Areas (WMAs), Mud Lake WMA, approximately 35 km (22 mi) to the north, and the Market Lake WMA, approximately 32 km (20 mi) to the northeast (IFG, 2008);
- Camas National Wildlife Refuge (NWR), approximately 44 km (27 mi) to the north (USFWS, 2008b);
- Hell's Half Acre WSA, located on the south side of Highway 20 (BLM, 2008a), adjacent to the proposed site, and;
- Fort Hall Indian Reservation, about 60 km (37 mi) to the south.

The soil in the northeast portion of the proposed site where the irrigated farmland occurs is classified by the U.S. Natural Resources Conservation Service (NRCS) as prime farmland, if irrigated (NRCS, 2008b). The NRCS is responsible for the preservation of prime or unique farmlands as outlined in the Farmland Protection Policy Act (FPPA) (USC, 2006a). Although the proposed enrichment facility will occupy soils identified as prime farmland, private actions on private lands and Federal permitting and licensing involving prime farmland are not subject to protection under FPPA. Therefore, no NRCS formal land evaluation and site assessment are required for the proposed enrichment facility.

3.1.6 Ecological Use

May 2008, June 2008, October 2008, January 2009, and April 2009

Wildlife observed on and near the proposed site during field visits in ~~May, June and October 2008~~ were species common to the area. Mammals observed included Pronghorn (*Antilocapra americana*), jack rabbit (*Lepus spp.*), and coyote (*Canis latrans*).

Common bird species observed included horned lark (*Eremophila alpestris*), western meadowlark (*Sturnella neglecta*), Brewer's sparrow (*Spizella breweri*), sage thrasher (*Oreoscoptes montanus*), northern harrier (*Circus cyaneus*), mourning dove (*Zenaida macroura*), killdeer (*Charadrius vociferus*), brown-headed cowbird (*Molothrus ater*), crow (*Corvus brachyrhynchos*), and long-billed curlew (*Numenius americanus*). A single greater

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2008

sage grouse (*Centrocercus urophasianus*) was observed in May about 1.6 km (1 mi) north of the proposed site, and multiple roost sites were observed in three areas of the proposed site during June 2008 surveys.

See Section 3.5, Ecological Resources, for a detailed discussion of other animals that may be found near the site.

3.1.7 Water Resources

Known sources of water in the vicinity of the proposed site include Mud Lake, Market Lake WMA, the Snake River, Camas NWR, and American Falls Reservoir (American Falls Chamber of Commerce, 2008) (IFG, 2008) (USFWS, 2008b). Both Mud Lake and Market Lake are designated as Wildlife Management Areas dedicated to primary uses such as big game, waterfowl, fishing and general public use (IFG, 2008).

The Snake River is located 32 km (20 mi) east of the proposed site and runs north to south through the town of Idaho Falls and is used for recreational activities as well as providing wildlife habitat along its extensive corridor in the surrounding area (Idaho Falls Chamber of Commerce, 2008). Camas NWR located 44 km (27 mi) to the north of the proposed site is comprised of over 4,050 ha (10,000 ac) of marshes, meadows, and uplands used for wildlife observation, waterfowl, and upland game bird hunting (USFWS, 2008b).

American Falls Reservoir, located 68 km (42 mi) southwest of the proposed site is the largest reservoir on the Snake River and is used for a variety of outdoor sporting and recreational activities (RecreationGov, 2008). Although commercial fishing for some species is permitted at Mud Lake and along designated reaches of the Snake River, there are no commercial fishing operations on or near the proposed site.

3.1.8 Agricultural Use

Various crops are grown in Bonneville, Bingham and Jefferson Counties. About 389 ha (962 ac) of irrigated land on the proposed site are used to grow potatoes and grains. The crop land stubble is grazed in the winter and the remainder of the property is grazed in the spring. Within the vicinity of the proposed site, agricultural activity is comprised mainly of corn, wheat, oats, barley, potato, and hay farms; small dairy and feedlot operations, and; cattle and sheep grazing. See Table 3.1-2, USDA Agriculture Census, Crop, and Livestock Information (USDA, 2008a). No leafy vegetable crops are grown within 8 km (5 mi) of the proposed site. Potato production in the area loses approximately 6 to 8% of the crop to disease damage, with the remaining portion going to direct consumption, processing, or as future seed source. For grazing animals in the vicinity of the proposed site, the fraction of daily intake from pasture varies by the animal as noted in Table 3-1.3, Estimated Fraction of Daily Intake from Pasture.

The principal livestock for Bonneville, Bingham and Jefferson counties is cattle. Milk cows comprise a small portion of the number of cattle in the three counties, with the nearest feedlot and milking operation located about 16 km (10 mi) east of the proposed site. A small farm that raises dairy cows is located about 19 km (12 mi) east of the proposed site. The largest dairy operation near the proposed site is Reed's Dairy, located 32 km (20 mi) east, near the city of Idaho Falls, Idaho.

Cattle and sheep grazing occur both east and west of the proposed site. The State-owned L-shaped land adjacent to the property to the west (Figure 3.1-3, Land Ownership Map Within 8 km (5 mi)), is currently leased to the Siddoway Sheep Company until 2012. The parcel is used in conjunction with other BLM lands as part of the Twin Butte Allotment and is used by BLM for

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Pleistocene basalt lava flows and minor pyroclastic deposits estimated to have erupted about 200 to 400 ka (Kuntz, 1994).

3.3.2.4 Local Stratigraphy

3.3.2.4.1 Soils at the Proposed Site

Thicknesses of unconsolidated surficial sediment and soil cover in the ESRP are variable, ranging from zero in areas of recent volcanism to tens of meters (tens of feet) in areas of wind-blown loess derived from exposed lava flows, lacustrine deposits, and alluvial fill (Hughes, 1999; Scott, 1982; Whitehead, 1994a). Thin soils and basalt outcrops are typical of ridge lines and wind-swept areas, of the axial volcanic zone, the broad constructional volcanic highland on which the proposed site is located.

During the fall of 2007 and the spring of 2008, thirty boreholes were drilled to determine depth to bedrock and collect samples for geotechnical and geochemical testing. Geotechnical testing was conducted at 14 locations, and geochemical testing was conducted at 10 surface locations (Figures 3.3-14A, Borehole and Soil Sample Locations, and 3.3-14B, Cross Section A-A' and B-B' on the Proposed EREF Footprint) and latitude and longitude for soil sampling locations are provided in Table 3.3-2, Site Soil Sample Locations. As shown in Figure 3.3-14B, Cross Section A-A' and B-B' on the Proposed EREF Footprint, the depth of bedrock at the proposed EREF ranges between bedrock outcrop and a soil depth of up to ~~6.6 m (21.5 ft)~~ 6.2 m (20.5 ft).

Soil Deposits

Unconsolidated surficial deposits at the proposed site are primarily transported sedimentary materials of eolian origin rather than soils developed in situ as a result of regolith weathering. Scott (Scott, 1982) mapped the surficial deposits in the area of the proposed site as Pleistocene loess deposits, which form a thin discontinuous cover overlying Pleistocene basalt lava flows. The loess is composed of silt and sandy silt containing sparse angular to subrounded basalt gravel derived from nearby lava outcrops, is massive or faintly bedded, and overall is moderately to well sorted.

The U. S. Department of Agriculture soil survey for Bonneville County, Idaho (NRCS, 2008c) categorizes most of the soils at the proposed site as Pancheri silt loams with slopes ranging from 0 to 8 percent (50 to 75% of the area) (Figure 3.3-15, Soil Map of the Proposed Site; Table 3.3-3, Summary of Soils by Map Unit). The Pancheri series consists of deep and very deep, well-drained soils that formed in loess covered lava plains (NRCS, 2008c). The taxonomic class for the Pancheri series is coarse-silty, mixed, superactive, frigid Xeric Haplocalcids. This description is consistent with detailed studies of soils at the nearby INL where they are described as falling mostly in the silt-loam textural class with 0 to 27% clay, 55 to 80% silt, and 10 to 35% sand (Nimmo, 2004). The drainage and permeability of the Pancheri series are described as well-drained, medium or slow runoff, moderate permeability (NRCS, 2008c). The remainder of the proposed site is characterized as Polatis-rock outcrop complex, Pancheri-rock outcrop complex, and lava flows.

3.3.2.4.2 Lithology of GW-1 Rock Cores

Core hole GW-1 was drilled near the geographic center of the proposed site and a continuous rock core was collected from land surface to a total depth of 223.0 m (730.5 ft) below land surface (Figure 3.3-16, Existing Agricultural and Newly Installed Monitoring Wells). A rock boring log was compiled during the drilling process to describe the general features of the core materials. Geophysical logs were also obtained, including a subsurface photographic record of 1a

The soil samples were also analyzed for radiological chemical components. These analyses were performed by gamma isotopic and uranium specific analyses. Soil samples were analyzed for naturally-occurring primordial radionuclides, the thorium decay series, and the uranium decay series. The 10 soil samples were also analyzed for cesium, potassium, and actinium. Refer to Section 3.11, Public and Occupational Health, for a discussion of the radiological analyses results for these soil samples.

3.3.5 Geological Investigation

Site geotechnical investigations were conducted in November 2007 and in May 2008. The results of these investigations are provided in Appendix E. The investigation in November 2007 consisted of 20 test borings. The subsequent investigation in May 2008 consisted of 10 test borings. The boreholes were drilled using a hollow-stem auger, split-spoon sampling and a Dames and Moore sampler. Split spoon sampling was performed in accordance with ASTM D1586-99 (ASTM, 1999). The data from the subsurface investigation was generally consistent with the published regional information obtained during the review of available geologic and soil information. The site investigations included the installation and monitoring of groundwater wells, geophysical investigations in boreholes, and surface geology mapping. The borings and sample locations are shown in Figure 3.3-14A, Borehole and Soil Sample Locations and were located to provide coverage of the site.

6.2 m (20.5 ft)

The soil is generally 0 to 4.3 m (0 to 14.0-ft) thick and overlies fractured basalt lava flows. At one of the test-hole locations the soil was approximately ~~6.6 m (21.5 ft)~~ thick. Soils are of eolian origin and are classified primarily as low-plasticity clays. Colors of the soil include light tan, tan, light brown~~, grayish brown~~ and dark brown. Rock outcrops cover 14% of the total area of the proposed site. Geologic mapping of the bedrock exposures indicates that the basalt is strongly vesicular and contains discontinuities such as strongly developed columnar jointing and cavities. Several collapsed lava tubes filled with rubble were reported in the northern portion of the site area.

The Standard Penetration Test (SPT) N-values ranged from 1 to 53. N-values ranged from 1 to 43 for a depth of 1.5 m (5.0 feet) below ground surface and between 11 and 53 for depths 3 m (10 feet) or more below ground surface. The N-values suggest a consistency that ranges from very soft to hard. Rock Quality Designations (RQD) for one deep cored boring indicate that the bedrock ranges from fair to excellent quality (64% to 100%) within the top 30 m (100 ft) of the boring. Several localized zones of broken rock and soil were observed at considerably greater depths. A fractured interval between 69 m (225 ft) and 70 m (230 ft) yielded an RQD of 0 and a 2.5 m (8.0 ft) layer of soil was encountered between 123 m (403 ft) and 125 m (410 ft). Thin layers of soil were encountered between 18.6 m (61.0 ft) and 19.5 m (64.0 ft) and 59.1m (194.0 ft) and 60.8 m (199.5 ft). The depths of these zones greatly exceed the anticipated depth of influence of foundations and will not negatively impact the capacity of the rock to provide adequate bearing.

Laboratory tests on soil samples included moisture content, natural dry density, specific gravity, grain size analysis, Atterberg limits, modified Proctor, Hveems's resistance value (R value), pH, resistivity, sulfate content, and consolidation tests. The laboratory testing was conducted in accordance with ASTM standards. The specific ASTM standards used were ASTM C136 (ASTM, 1992), ASTM D1140 (ASTM, 2000a), ASTM D1557 (ASTM, 2002a), ASTM D422-63 (ASTM, 2002b), ASTM D2216 (ASTM, 1998), ASTM D2435 (ASTM, 2002c), ASTM D2487 (ASTM, 2000b), ASTM D2844 (ASTM, 2001), and ASTM D4318 (ASTM, 2000c). The natural dry density of finer soil samples tested, were 1.30, 1.41, 1.45, 1.67, and 1.79 g/cm^3 (81.2, 88.0, 90.4, 104.4, and 112.0 lbs/ft^3). The natural moisture content of the materials tested ranged from

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amount that infiltrates into the ground, a portion is expected to eventually return to the atmosphere via evapotranspiration by vegetation growing within and in the vicinity of the basin. As shown in Tables 3.4-6 and 3.4-7, the combination of both potential infiltration and potential evaporation are more than sufficient to dispose of basin inflows on a monthly basis.

In summary, the results demonstrate that even under the maximum scenarios, the capacities of the basins are not exceeded. As stated above, the evaporation rates used in calculating the water balances for the retention and detention basins are based on historic ambient evaporation rates for the site area. Should ambient seasonal air temperatures increase due to global warming and climate change, the evaporation rates would be expected to increase, further reducing infiltration from the detention basin and/or the potential to exceed basin capacities. As a result, the water balance tables are considered conservative.

3.4.2 Water Quality Characteristics

As discussed in ER Section 3.4.1, Surface Hydrology, there are no surface water bodies at the proposed facility and no surface water was present in the drainages during the site field investigations and site visits between November 2007 and July 2008 and in October 2008. The vast majority of runoff from precipitation at the site is effectively contained on site by the natural topography where it infiltrates into the shallow soils. There are small linked drainages that likely convey limited seasonal drainage. The heads of these drainages are near the boundary of the facility footprint.

Two agricultural wells (Lava Well-3 and Spud Well) were previously installed at the proposed site. In addition, five deep aquifer monitoring wells (GW-1 through GW-5) and one shallow perched water well (GW-4S) were drilled and installed on the proposed site (see Figure 3.4-5). Standard protocols were followed during all phases of well drilling, installation, completion, development, and sample collection.

Groundwater samples were collected from all of the aquifer monitoring wells; however, a groundwater sample could not be obtained from the shallow perched water well (GW-4S) due to lack of water. GW-4S was installed to determine if a perched groundwater system existed at the site; however, this well has remained dry since completion. The existing agricultural wells were sampled in March 2008, June 2008, and ~~October~~ SEPTEMBER 2008. The deep monitoring wells GW-1 through GW-5 were sampled as they were completed between May 2008 and July 2008, and sampled a second time in October 2008. Additional groundwater sampling was performed in January, 2009 and April, 2009. ~~The analytical results will be provided by July 31, 2009.~~ The regional and local groundwater chemistry is described in detail in ER Section 3.4.15.

3.4.3 Pre-Existing Environmental Conditions

Historically, the site has been used for farming and grazing. There is no documentation of manufacturing, storage, or significant use of hazardous chemicals on the subject property. The closest area of large industrial operations is the INL. The eastern boundary of the INL is about 0.8 km (0.5 mi) west of the proposed site. The INL property near the proposed site is undeveloped rangeland. The closest facility on the INL property is the Materials and Fuels Complex located approximately 16 km (10 mi) west of the proposed property boundary. There are no other commercial or industrial facilities within 8 km (5 mi) of the site.

The primary anthropogenic effects on water quality reported for the ESRP Aquifer in the vicinity to the EREF are due to:

- Agricultural practices

SEPTEMBER/ JANUARY 2009, AND APRIL 2009.

Site-specific hydrogeologic investigations occurred at the proposed EREF site between May and July 2008. Additional groundwater sampling was performed in October 2008. The proposed site is located east of the INL site, which has had numerous subsurface investigations performed for the purpose of delineating and monitoring the subsurface hydrologic conditions. Much of this information is directly pertinent to the proposed site and provides the basis for the regional groundwater information summarized in this ER. In addition, the INL hydrogeologic information was used in planning the site-specific investigations.

The objective of the groundwater field studies was to collect data that can be used to describe the following characteristics for the site:

- Stratigraphy of the bedrock units
- Structure and hydrogeological properties of unsaturated and water saturated geological units
- Depth to saturated groundwater conditions within the site boundaries
- Groundwater elevation trends and flow directions
- Prevalence of perched groundwater systems
- Water quality for groundwater
- Potential for interaction between different aquifers

Field activities included:

- Collection of a continuous core between the ground surface and approximately 12.2 m (40.0 ft) below the static water table,
- Installation of five deep monitoring wells to intercept the regional groundwater,
- Installation of one shallow monitoring well to intercept potentially perched groundwater,
- Down hole geophysical testing in two locations,
- Hydrologic testing in both the saturated and unsaturated zones, and
- Groundwater collection and analyses.

Five deep monitoring wells installed at the proposed site were designated as GW-1, GW-2, GW-3, GW-4, and GW-5. One shallow well (GW-4S) was also completed. The locations of these monitoring wells on the proposed site are shown in Figure 3.4-5, Existing Agricultural and Newly Installed Monitoring Wells, and are distributed to allow monitoring of the ground water elevations, evaluation of regional groundwater flow direction, and water quality at the EREF site. The wells are located in areas that are hydrologically upgradient (GW-5), cross gradient (GW-2 and GW-3), downgradient of the plant footprint (GW-4), and within the downgradient edge of the facility footprint (GW-1). The five deep wells provide adequate site-specific data to define the potentiometric surface of the groundwater, thereby providing data indicative of groundwater flow direction and gradient.

At location GW-1, a 7.6-cm (3.0-in) core was collected from the ground surface to the total depth of the boring prior to installation of a monitoring well. The core was collected using a diamond drill bit designed to produce intact core samples. The recovered core revealed a succession of basalt flows with occasional interlayers of silts and clays ranging in thickness between 1.2 to 2.4 m (4.0 to 8.0 ft). The basalt flows typically were highly fractured and highly vesicular, although there were also intervals up to 3.0 m (9.8 ft) thick or more of competent basalt without fractures or vesicles.

GROUNDWATER SAMPLES WERE ALSO COLLECTED FROM THE EXISTING AGRICULTURAL WELLS AND THE DEEP MONITORING WELLS IN SEPTEMBER/OCTOBER 2008, JANUARY 2009, AND APRIL 2009.

changes in irrigation practices in the ESRP (Garabedian, 1992)(Lindholm, 1996). It does not appear that seasonal infiltration events play a significant role in area of the proposed site.

3.4.15.4 Site Groundwater Quality

Groundwater was collected and analyzed from the existing agricultural wells on the site in March 2008 and June 2008, and the deep monitoring wells were sampled during installation between May and July 2008~~, and sampled a second time in October 2008~~. The shallow perched water well (GW-4S) has remained dry since completion.

The two existing agricultural wells and the newly installed five aquifer monitoring wells at the EREF site were sampled for field measured parameters and inorganic analytes, metals (dissolved and total recoverable including major cations and anions), total organic carbon, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), pesticides, herbicides, and ~~total~~ petroleum hydrocarbons (Table 3.4-13, Chemical Analyses for the EREF Site Groundwater). In addition, samples were analyzed for radiological constituents of tritium, gross alpha, gross beta, gamma spectrometry, thorium isotopes, uranium isotopes and radium isotopes (Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). Sampling results are compared to EPA maximum contaminant levels (MCLs) and secondary maximum contaminant levels (SMCLs) (Tables 3.4-13, Chemical Analyses for the EREF Site Groundwater, and Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). The regulatory limits represent the EPA Safe Drinking Water Act (SDWA) primary and secondary drinking water standards for potable water supplies (EPA, 2008b). In addition, inorganic data are compared to background values (Figure 3.4-14, Piper Diagram Showing Major Elemental Composition of Groundwater in the ESRP Aquifer).

The analytical results show that the groundwater has concentrations of major ions that are consistent with regional groundwater (Table 3.4-12, Mean Concentrations of Analytes in SRP Shallow Zone Groundwater). The regional groundwater has a predominantly calcium-bicarbonate chemical composition and is of high quality when compared to drinking water standards (DOE-ID, 2007a; DOE-ID, 2007b; Wood, 1988).

The concentrations of dissolved analytes are below their corresponding EPA MCL. Concentrations of minor elements and trace metals found in the aquifer at the EREF are similar to regional background groundwater concentrations (Table 3.4-12, Mean Concentrations of Analytes in SRP Shallow Zone Groundwater, and Tables 3.4-13, Chemical Analyses for the EREF Site Groundwater). With the exception of total recoverable aluminum and iron collected from the two agricultural wells (highlighted in Table 3.4-13, Chemical Analyses for the Eagle Rock Enrichment Site Groundwater), total metals concentrations are less than their EPA MCL. The elevated total recoverable aluminum and iron concentrations detected in the unfiltered samples are probably due to suspended particulates because aluminum is not soluble at the neutral to slightly alkaline pH of the SRP Aquifer, and dissolved concentrations of aluminum and iron do not exceed their MCLs. Also, iron shows variability with the total recoverable concentration exceeding the EPA MCL only for the initial ~~May~~ 2008 samples but not in more recent samples. The concentrations of minor elements and metals are generally low due to the neutral to slightly alkaline pH. Total dissolved solids are approximately ~~200~~ to ~~260~~ mg/L, which is lower than the EPA limits of 500 mg/L.

(MARCH 25, 2008 SAMPLES)

MARCH 170 292

SEPTEMBER/

No volatile or semi-volatile organic compounds, pesticides, herbicides, or PCBs were detected in the March to July 2008 samples. The October 2008 samples from GW-1, GW-2, and GW-3 contained low concentrations of bis (2-ethylhexyl) phthalate and a single detection of diethylphthalate occurred for GW-5. These two phthalate compounds are used as plasticizers and it is expected that their occurrence is from contact of the samples with plastics during

collection and analyses. ~~Trace amounts of chloroform were also detected once (October 2008) in the QA/QC blank sample for Spud Well; however, chloroform was not detected in any other QA/QC or primary or samples. The chloroform result was slightly above the practical quantitation limit (PQL) and was likely the result of laboratory cross contamination~~. Lube oil was detected ~~at low concentrations~~ in samples from the irrigation well, Lava Well-3, ~~and from well GW-4~~. Lubricating oil is a known contaminant associated with well drilling and likely explains the occurrence of petroleum in ~~both~~ wells. No other petroleum hydrocarbons were detected in the site groundwater samples.

EXCEPT FOR THE JUNE 19, 2008 SAMPLE.

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Most of the radiological analytes were less than their respective minimum detectable concentration (MDC) (Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). The gamma spectroscopy analytes, gross alpha and tritium were below their MDCs in all samples. The radiological analytes that occurred most frequently above their MDCs were gross beta, Uranium-234 and Uranium-238 (MDC exceedences are highlighted in Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). These analytes are naturally occurring and are similar in concentration to background values observed at the INL (DOE-ID, 2007b). In addition, Thorium-230 was detected just above it's MDC in wells Lava 3-01 and GW-04 and Thorium-232 was detected above its MDC in Lava 3-01 (3/25/08 sample only), Spud-01 (6/19/08 sample only), and well GW-5. Tritium was also detected in GW-3 in the May 20, 2008 sample only. The radiological analytical results were less than MCLs, where applicable.

REPLACE PARAGRAPH WITH INSERT B.

Some of the radionuclide results given in Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater, are negative. It is possible to calculate radioanalytical results that are less than zero, although negative radioactivity is physically impossible. This result typically occurs when activity is not present in a sample or is present near background levels. Laboratories occasionally choose not to report negative results or results that are near zero. For the groundwater samples, the negative values are left as reported so as not to censor the results.

Insert A – ER Section 3.4.15.4

Diesel was detected in the groundwater sample collected on July 9, 2008 from GW-4. This may be due to exhaust from the truck used for sampling. Phenol was detected in the January 6, 2009 and April 7, 2009 samples collected from Lava Well-3. Considering that phenol is a common additive to petroleum lubricants, its presence is attributed to lube oil which was also detected in the January and April 2009 samples collected from this same well. Low concentrations of toluene were also detected in wells GW-1, GW-2, GW-3, GW-4 and GW-5 during the January and April 2009 sampling events. Considering that gasoline contains toluene, the likely cause for these detections is the exhaust from the portable gasoline powered generator used to operate the groundwater sample collection pump.

Insert B – ER Section 3.4.15.4

Most of the radiological analytes were less than their respective minimum detectable concentration (MDC) (Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). The gamma spectroscopy analyte, gross alpha, was below its MDC in all samples. Tritium (H-3) was only detected in GW-3 in the May 20, 2008 sample. The radiological analytes that occurred most frequently above their MDCs were gross beta, Uranium-234 and Uranium-238 (MDC exceedances are highlighted in Table 3.4-14, Radiochemical Analyses for the EREF Site Groundwater). These analytes are naturally occurring and are similar in concentration to background values observed at the INL (DOE-ID, 2007b). Radiological analytes detected less frequently above their MDCs in various wells included Potassium-40, Uranium-235, Radium-224, Radium-226, Thorium-228, Thorium-230 and Thorium-232. Where applicable, the radiological analytical results were less than MCLs.

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	Spud Well	Lava Well 3	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA 3-01	SPUD WELL-01	GW-03-01	GW-05-01	SPUD WELL-01	LAVA WELL 3-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	03/25/08	03/25/08	05/20/08	06/19/08	06/19/08	06/19/08	07/07/08	07/09/08	07/10/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Field Parameters											
pH (s.u.)	6.73	7.8	7.52	7.70	7.94	7.74	7.83	8.43	8.11	-	6.5 to 8.5[4]
Temp °C (°F)	9.4 (48.9)	6.6 (43.9)	12.3 (54.1)	12.7 (54.9)	11.8 (53.2)	12.0 (53.6)	13.1 (55.6)	13.2 (55.8)	13.7 (56.7)	-	NS
Electrical Conductivity µS/cm (µmhos/cm)	NM	NM	358 (358)	350 (350)	425 (425)	345 (345)	302 (302)	294 (294)	285 (285)	-	NS
Depth to water m (ft) (BGS[2])	217.9 (715)	NM	208.9 (685.3)	220.0 (721.9)	NM	NM	208.6 (684.3)	201.5 (661.1)	202.9 (665.7)	-	
Lab Parameters											
Dissolved											
Aluminum	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	0.08	0.05 - 0.2[4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	<0.003	0.00303	<0.003	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.0103	0.0149	0.0115	0.0113	0.0138	0.0101	0.0074	0.0098	0.0103	0.002	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.063	0.065	0.061	0.059	0.065	0.061	0.049	0.052	0.044	0.04	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	40.0	49.7	40.6	38.1	46.4	37.2	32.1	32.8	29.2	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3[5]
Iron	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	0.3[4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015[5]
Magnesium	11.4	14.1	11.8	11.3	13.8	11.0	9.44	9.75	8.79	0.06	NS
Manganese	<0.004	0.0075	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0048	0.004	0.05[4]
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	0.0089	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS

Table 3.4-13 Chemical Analyses for the EREFSite Groundwater
(Page 2 of 19)

Well Name	Lava Well 3	Spud Well	GW-3	GW-5	Spud Well	Lava Well 3	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA 3-01	SPUD WELL-01	GW-03-01	GW-05-01	SPUD WELL-01	LAVA WELL-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	03/25/08	03/25/08	05/20/08	06/19/08	06/19/08	06/19/08	07/07/08	07/09/08	07/10/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Lab Parameters											
Dissolved											
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.10	3.47	3.05	3.11	3.42	2.93	2.47	2.70	2.50	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	35.9	34.8	32.5	33.4	32.2	33.9	34.9	35.5	34.0	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1[4]
Sodium	16.3	18.5	17.2	17.0	18.2	16.2	14.8	14.0	13.0	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Zinc	<0.01	0.457	0.143	0.0528	0.0853	<0.01	0.0871	0.186	0.113	0.01	5[4]
Total Recoverable											
Aluminum	**0.366**	**0.223**	<0.08 J	<0.08 J	<0.08 J	<0.08 J	<0.08 J	<0.08 J	<0.08 J	0.08	0.05 - 0.2[4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	0.0039	0.00434	0.00443	0.00453	0.00599	0.00584	0.00554	0.00503	<0.003	0.003	0.01
Barium	0.0119	0.0171	0.0103	0.0116	0.0149	0.0102	0.0082	0.0103	0.0130	0.002	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.064	0.07	0.058	0.068	0.071	0.068	0.050	0.060	0.057	0.04	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	41.3	51.1	37.3	40.6	49.8	39.2	35.0	35.3	33.5	0.04	NS
Chromium	<0.006	0.0096	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3[5]
Iron	**1.19**	**0.515**	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	0.3[4]
Lead	<0.0075	0.0104	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015[5]
Magnesium	12.3	14.5	10.8	11.9	14.5	11.6	10.0	10.4	10.1	0.06	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 3 of 19)

Well Name	Lava Well 3	Spud Well	GW-3	GW-5	Spud Well	Lava Well 3	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA 3-01	WELL SPUD-01 ^	GW-03-01	GW-05-01	SPUD WELL-01	WELL LAVA 3-01 ^^	GW-01-01	O GW-4-01 ^	O GW-2-01 ^		
Sample Date	03/25/08	03/25/08	05/20/08	06/19/08	06/19/08	06/19/08	07/07/08	07/09/08	07/10/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Total Recoverable											
Manganese	0.0221	0.0058	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0064	0.004	0.05 [4]
Mercury (TOTAL)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.17	3.48	2.89	3.10	3.38	3.01	2.96	2.85	2.84	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	38.7	36.5	32.4	35.9	34.9	35.4	37.0	38.2	38.6	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	16.7	18.5	16	16.7	18.0	15.7	15.0	14.5	13.9	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Zinc	0.0146	1.03	0.131	0.0629	0.104	<0.01	0.0925	0.202	0.157	0.01	5 [4]
Organics										**PQL (mg/L)**	
Lube Oil	1.23	ND	ND	ND	ND	ND	ND	ND	ND	0.5	NS
Diesel	ND	ND	ND	ND	ND	ND	ND	0.107	ND	0.1	NS
Gasoline	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.1	NS
SVOC	ND	ND	ND	ND	ND	ND	ND	ND	ND	Various	Various
VOC	ND	ND	ND	ND	ND	ND	ND	ND	ND	Various	Various
Pesticides	ND	ND	ND	NA	NA	NA	ND	ND	ND	Various	Various
Herbicides	ND	ND	ND	ND	ND	ND	ND	ND	ND	Various	Various
Polychlorinated biphenyls, PCB	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0002	0.0005
~~TOC~~	~~ND~~	~~ND~~	~~ND~~	~~2.18~~	~~6.01~~	~~2.60~~	~~ND~~	~~ND~~	~~ND~~	~~1~~	~~NS~~

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater

(Page 4 of 9)

Well Name	Lava Well 3	Spud Well	GW-3	GW-5	Spud Well	Lava Well 3	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA 3-01	SPUD-01	GW-03-01	GW-05-01	SPUD WELL-01	LAVA 3-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	03/25/08	03/25/08	05/20/08	06/19/08	06/19/08	06/19/08	07/07/08	07/09/08	07/10/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Inorganic major cations and anions											
Bicarbonate	143	170	142	142	165	140	130	129	126	1	NS
Carbonate	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	NS
Chloride	13.4	16.2	12.9	13.1	16.9	13.9	9.73	9.46	8.50	~~1.0~~	250[4]
Cyanide (free)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2
Fluoride	0.862	0.728	0.8	1.1	0.834	1.09	0.803	0.810	0.801	0.1	2[4]
Nitrate as N	1.29	1.44	<0.05	1.29	1.48	1.30	1.38	1.46	1.47	0.05	10
Nitrite as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1
General Properties[6]											
pH (S.U.)	7.43	7.98	8.12	8.03	8.06	8.05	8.11	8.06	8.19	No RL	6.5 to 8.5[4]
Specific conductance µS/cm (umhos/cm)	370 (370)	440 (440)	460 (460)	360 (360)	430 (430)	350 (350)	320 (320)	310 (310)	270 (270)	1 (1)	NS
Sulfate as SO4	21.6	33.8	22.7	24.1	35.9	22.7	13.1	12.5	10.4	0.3	250[4]
Total Alkalinity	143	170	142	142	165	140	130	129	126	1	NS
Total Dissolved Solids	220	260	230	230	260	220	210	200	200	10	500[4]
Total Organic Carbon	<1.00	<1.00	<1.00	2.18	6.01	2.60	<1.00	<1.00	<1.00	1	NS
Total Suspended Solids	19	13	<5	<5	<5	<5	<5	<5	<5	5	NS

VARIOUS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 5 of 9)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL 03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	9/29/08	9/30/08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Field Parameters									
pH (s.u.)	7.7	7.9	7.92	7.66	7.84	7.71	7.91	-	6.5 to 8.5 [4]
Temp °C (°F)	11.84 (53.31)	15.17 (59.31)	11.9 (53.42)	11.82 (53.28)	13.22 (55.80)	12.68 (54.82)	13.7 (56.66)	-	NS
Electrical Conductivity µS/cm (µmhos/cm)	356 (356)	349 (349)	358 (358)	416 (416)	300 (300)	292 (292)	282 (282)	-	NS
Depth to water m (ft) (BGS[2])	NM	NM	NM	NM	NM	NM	NM	-	
Lab Parameters									
Dissolved									
Aluminum	<0.08 [3]	<0.08 [3]	<0.08 [3]	<0.08 [3]	<0.08 [3]	<0.08 [3]	<0.08 [3]	0.08	0.05 - 0.2 [4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	0.00324	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.0098	0.0095	0.0102	0.0139	0.0069	<0.0079	<0.0086	0.002	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.057	0.056	0.056	0.059	0.049	0.048	0.046	0.04	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	36.7	35.5	37	45.3	31.1	30.8	29.3	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS — DELETE
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3 [4,5]
Iron	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	0.3 [4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015 [5]
Magnesium	10.7	10.3	10.9	13.1	9.16	9.04	8.89	0.06	NS
Manganese	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.05 [4]
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 6 of 19)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL 03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-02-01		
Sample Date	9/29/08	9/29/08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Lab Parameters									
Dissolved									
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	2.86	2.8	2.9	3.16	2.65	2.6	2.64	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	32.8	32.6	33	32.1	33.6	33.9	34.3	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1[4]
Sodium	15.9	15.8	16.4	17.4	13.7	13.3	13	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	~~0.005~~ NS
Zinc	0.0165	<0.01	0.0211	0.0353	<0.01	0.0321	0.0228	0.01	5[4]
Total Recoverable									
Aluminum	0.175	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	<0.08[3]	0.08	0.05 - 0.2[4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.012	0.011	0.0106	0.014	0.0074	0.0095	0.0091	0.002	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.064	0.065	0.061	0.063	0.051	0.054	0.048	0.04	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	39.6	38	37.4	44.9	31.3	32.4	30.9	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS DELETE
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3[5]
Iron	0.255	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	0.3[4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015[5]
Magnesium	11.6	11.2	11	13.1	9.16	9.63	9.47	0.06	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL 03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	9/29/08	9/29/08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Total Recoverable									
Manganese	0.0043	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0044	0.004	0.05 [4]
Mercury (TOTAL)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.02	2.99	2.97	3.18	2.65	2.67	2.7	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	35.2	34.1	35.7	34.1	35.8	35.5	36.1	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	17.3	17.4	16.7	17.2	13.6	14	13.8	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	~~0.005~~ NS
Zinc	0.0669	<0.01	0.0283	0.0377	0.0139	0.0384	0.0536	0.01	5 [4]
Organics								**PQL (mg/L)**	
Lube Oil	ND	0.592	ND	ND	ND	ND	ND	Various	~~Various~~ NS
Diesel	ND	ND	ND	ND	ND	ND	ND	0.1	NS
Gasoline	ND	ND	ND	ND	ND	ND	ND	0.1	NS
bis(2-Ethylhexyl) Phthalate	1.04	ND	ND	ND	3.1	ND	8.44	0.5	NS
Diethylphthalate	ND	ND	1.62	ND	ND	ND	ND	0.5	NS
Remaining SVOCs	ND	ND	ND	ND	ND	ND	ND	Various	Various
Chloroform	ND	ND	ND	ND	ND	ND	ND	0.5	0.08
Remaining VOCs	ND	ND	ND	ND	ND	ND	ND	Various	Various
Pesticides	ND	ND	ND	ND	ND	ND	ND	Various	Various
Herbicides	ND	ND	ND	ND	ND	ND	ND	Various	Various
Polychlorinated biphenyls, PCB	ND	ND	ND	ND	ND	ND	ND	0.0002	0.0005

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	9/29/08	9/29//08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
~~TOC~~	~~<1~~	~~<1~~	~~<1~~	~~<1~~	~~1.07~~	~~1.26~~	~~1.59~~	~~1~~	~~NS~~
Inorganic major cations and anions									
Bicarbonate	147	148	147	168	133	129	126	1	NS
Carbonate	<1	<1	<1	<1	<1	<1	<1	1	NS
Chloride	13.9	14	14.4	14.4	9.92	9.38	8.73	0.2 (1.0)	250[4]
Cyanide (free)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2
Fluoride	0.795	0.805	0.797	0.682	0.801	0.783	0.784	0.1	2[4]
Nitrate as N	1.31	1.32	1.32	1.46	1.38	1.42	1.45	0.05	10
Nitrite as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1
General Properties[6]									
pH (S.U.)	8.09	7.91	8.08	8.07	8.13	8.06	8.11	No RL	6.5 to 8.5[4]
Specific conductance µS/cm (umhos/cm)	370 (370)	370 (370)	390 (390)	460 (460)	330 (330)	310 (310)	300 (300)	1 (1)	NS
Sulfate as SO4	22.1	20.9	22.7	32.9	13.3	12.2	10.1	0.3	250[4]
Total Alkalinity	147	148	147	168	133	129	126	1	NS
Total Dissolved Solids	250	240	230	280	200	180	170	10	500[4]
Total Organic Carbon	<1	<1	<1	<1	1.07	1.26	1.59	1	NS
Total Suspended Solids	6	<5	<5	<5	<5	<5	<5	5	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA WELL-03-01	SPUD WELL-01-01	GW-03-01	GW-05-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	01/06/09	01/05/09	01/07/09	01/08/09	01/06/09	01/06/09	01/08/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Field Parameters									
pH (s.u.)	8.02	7.67	7.75	8.14	8.03	8.28	8.26	-	6.5 to 8.5[4]
Temp °C (°F)	10.98 (51.76)	9.88 (49.78)	12.10 (53.78)	13.78 (56.80)	13.33 (55.99)	11.77 (53.19)	13.40 (56.12)	-	NS
Electrical Conductivity µS/cm (µmhos/cm)	358 (358)	435 (435)	363 (363)	364 (364)	308 (308)	300 (300)	279 (279)	-	NS
Depth to water m (ft)	NM	NM	NM	NM	NM	NM	NM	-	-
Lab Parameters									
Dissolved									
Aluminum	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	0.080	0.05 - 0.2[4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.00300	0.00306	<0.00300	<0.00300	<0.00300	<0.00300	<0.00300	0.00300	0.01
Barium	0.0110	0.0156	0.0113	0.0118	0.0085	0.0081	0.0076	0.0020	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.065	0.067	0.066	0.059	0.058	0.056	0.052	0.040	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	40.00	49.70	40.30	37.90	34.10	33.20	29.70	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3[5]
Iron	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	0.060	0.3[4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015[5]
Magnesium	11.70	14.50	11.70	11.40	10.10	9.73	9.08	0.06	NS
Manganese	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.05[4]
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS

Table 3.4-13 Chemical Analyses for the EREFSite Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA WELL-03-01	SPUD WELL-01-01	GW-03-01	GW-05-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	01/06/09	01/05/09	01/07/09	01/08/09	01/06/09	01/06/09	01/08/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Dissolved									
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.14	3.46	3.11	3.09	2.87	2.81	2.66	0.50	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	34.80	33.70	34.40	33.50	35.40	35.30	34.00	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	16.8	18.5	17.0	17.5	14.8	14.2	13.0	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	NS
Zinc	<0.0100	0.0483	0.3310	0.4200	0.3520	0.2620	0.2230	0.0100	5 [4]
Total Recoverable									
Aluminum	<0.080 [3]	<0.080 [3]	<0.080 [3]	<0.080 [3]	0.081 [3]	0.088 [3]	<0.080 [3]	0.080	0.05 - 0.2 [4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.0101	0.0139	0.0104	0.0111	0.0081	0.0078	0.0073	0.0020	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.058	0.059	0.057	0.057	0.049	0.048	0.047	0.040	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	38.30	46.10	38.40	37.60	32.10	31.20	29.50	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3 [5]
Iron	<0.060	<0.060	<0.060	<0.060	0.071	0.081	<0.060	0.060	0.3 [4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015 [5]
Magnesium	11.30	13.40	11.20	11.20	9.41	9.09	8.91	0.06	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA WELL-03-01	SPUD WELL-01-01	GW-03-01	GW-05-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	01/06/09	01/05/09	01/07/09	01/08/09	01/06/09	01/06/09	01/08/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Total Recoverable									
Manganese	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.05 [4]
Mercury (Total)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.01	3.18	2.99	3.04	2.67	2.60	2.63	0.50	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	34.00	31.60	33.30	33.30	34.00	33.80	34.30	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	16.3	17.1	16.4	17.6	13.6	13.3	13.3	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	NS
Zinc	<0.0100	0.0421	0.3030	0.4030	0.4240	0.2880	0.2240	0.0100	5 [4]
Organics								**PQL (mg/L, or as noted)**	
Lube Oil	5.99	ND	ND	ND	ND	ND	ND	0.50/2.50 [7]	NS
Diesel	ND	ND	ND	ND	ND	ND	ND	0.1	NS
Gasoline	ND	ND	ND	ND	ND	ND	ND	0.1	NS
Phenol	0.00101	ND	ND	ND	ND	ND	ND	0.00050	NS
Remaining SVOCs	ND	ND	ND	ND	ND	ND	ND	0.0005	Various
Toluene	ND	ND	0.00312	0.00808	0.00998	0.00347	0.00251	0.00050	1
Remaining VOCs	ND	ND	ND	ND	ND	ND	ND	Various	Various

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA WELL-03-01	SPUD WELL-01-01	GW-03-01	GW-05-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	01/06/09	01/05/09	01/07/09	01/08/09	01/06/09	01/06/09	01/08/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Organics								**PQL (mg/L, or as noted)**	
Pesticides	ND	ND	ND	ND	ND	ND	ND	Various	Various
Herbicides	ND	ND	ND	ND	ND	ND	ND	0.0001	Various
Polychlorinated biphenyls, PCB	ND	ND	ND	ND	ND	ND	ND	0.0002	0.0005

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	Lava Well 3	Spud Well	GW-3	GW-5	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	LAVA WELL-03-01	SPUD WELL-01-01	GW-03-01	GW-05-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	01/06/09	01/05/09	01/07/09	01/08/09	01/06/09	01/06/09	01/08/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Inorganic major cations and anions									
Bicarbonate	151	180	152	150	136	136	129	1	NS
Carbonate	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	NS
Chloride	13.9	16.4	14.6	13.6	10.9	10.3	8.53	Various	250 [4]
Cyanide (free)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2
Fluoride	0.916	0.779	0.896	0.897	0.935	0.936	0.956	0.100	2 [4]
Nitrate as N	1.44	1.63	1.40	1.53	1.53	1.58	1.66	0.05	10
Nitrite as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1
General Properties [6]									
pH (s.u.)	8.01	7.99	7.93	7.91	8.00	8.02	7.93	No RL	6.5 to 8.5 [4]
Specific conductance µS/cm (umhos/cm)	390 (390)	470 (470)	380 (380)	400 (400)	340 (340)	330 (330)	310 (310)	1 (1)	NS
Sulfate as SO4	24.2	37.1	24.5	26.2	14.8	13.7	12.2	0.3	250 [4]
Total Alkalinity	151	180	152	150	136	136	129	1	NS
Total Dissolved Solids	220	270	260	240	200	180	180	10	500 [4]
Total Organic Carbon	<1.00	<1.00	<1.00	1.46	<1.00	<1.00	1.13	1.00	NS
Total Suspended Solids	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
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Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-04-01	GW-02-01		
Sample Date	4/08/09	4/07/09	4/08/09	4/06/09	4/07/09	4/07/09	4/06/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Field Parameters									
pH (s.u.)	7.85	7.9	7.58	7.96	8.1	8.22	8.18	-	6.5 to 8.5[4]
Temp °C (°F)	12.7 (54.9)	11.3 (52.3)	13.7 (56.7)	10.6 (51.1)	13.8 (56.8)	13.9 (57.0)	13.8 (56.8)	-	NS
Electrical Conductivity µS/cm (µmhos/cm)	372 (372)	362 (362)	367 (367)	439 (439)	312 (312)	306 (306)	291 (291)	-	NS
Depth to water m (ft)	NM	NM	NM	NM	NM	NM	NM	-	-
Lab Parameters									
Dissolved									
Aluminum	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	<0.080[3]	0.080	0.05 - 0.2[4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.0117	0.0117	0.0119	0.0162	0.0081	0.0086	0.0087	0.0020	2
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.061	0.060	0.059	0.064	0.054	0.052	0.050	0.040	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	41.20	40.00	39.90	49.90	32.80	32.80	31.20	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3[5]

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 15 of 19)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-02-01		
Sample Date	4/08/09	4/07/09	4/08/09	4/06/09	4/07/09	4/07/09	4/06/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Dissolved									
Iron	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.06	0.3 [4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015 [5]
Magnesium	12.10	11.70	11.70	14.50	9.78	9.93	9.58	0.06	NS
Manganese	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.05 [4]
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	2.92	2.92	2.88	3.26	2.63	2.72	2.65	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	35.30	35.40	34.90	34.70	35.90	36.00	36.50	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	17.6	16.9	18.0	18.4	14.3	14.5	13.8	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	NS
Zinc	0.206	<0.010	0.287	0.064	0.192	0.247	0.204	0.010	5 [4]
Total Recoverable									
Aluminum	<0.080 [3]	<0.080 [3]	<0.080 [3]	<0.080 [3]	<0.080 [3]	<0.080 [3]	<0.080 [3]	0.080	0.05 - 0.2 [4]
Antimony	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.006
Arsenic	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	0.01
Barium	0.0118	0.0099	0.0115	0.0135	0.0068	0.0072	0.0070	0.0020	2

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater

(Page 16 of 19)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL [1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-02-01		
Sample Date	4/08/09	4/07/09	4/08/09	4/06/09	4/07/09	4/07/09	4/06/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Total Recoverable									
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.004
Boron	0.063	0.056	0.060	0.058	0.047	0.047	0.047	0.040	NS
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Calcium	40.20	38.30	38.80	45.80	31.70	31.00	30.00	0.04	NS
Chromium	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	0.1
Cobalt	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006	NS
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	1.3 [5]
Iron	<0.06	<0.06	<0.06	0.16	<0.06	<0.06	<0.06	0.06	0.3 [4]
Lead	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	0.015 [5]
Magnesium	11.90	11.10	11.50	13.20	9.25	9.05	8.96	0.06	NS
Manganese	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.004	0.05 [4]
Mercury (Total)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.002
Molybdenum	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	0.008	NS
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	NS
Potassium	3.07	3.05	3.05	3.15	2.66	2.64	2.60	0.5	NS
Selenium	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	0.05
Silica (SiO2)	35.10	32.30	34.40	30.80	31.80	31.80	32.90	0.17	NS
Silver	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.1 [4]
Sodium	17.4	15.8	17.7	16.5	13.2	13.0	12.8	0.5	NS
Thallium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002
Vanadium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	NS
Zinc	0.217	<0.010	0.291	0.097	0.218	0.278	0.214	0.010	5 [4]

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 17 of 19)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	4/08/09	4/07/09	4/08/09	4/06/09	4/07/09	4/07/09	4/06/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Organics								PQL (mg/L)	
Lube Oil	ND	21.3	ND	ND	ND	ND	ND	0.5/5.0[7]	NS
Diesel	ND	ND	ND	ND	ND	ND	ND	0.1	NS
Gasoline	ND	ND	ND	ND	ND	ND	ND	0.1	NS
Phenol	ND	0.00153	ND	ND	ND	ND	ND	0.00050	NS
Remaining SVOCs	ND	ND	ND	ND	ND	ND	ND	0.0005	Various
Toluene	0.00239	ND	0.00480	ND	0.00344	0.01740	0.00864	0.00050	1
Remaining VOCs	ND	ND	ND	ND	ND	ND	ND	Various	Various
Pesticides	ND	ND	ND	ND	ND	ND	ND	Various	Various
Herbicides	ND	ND	ND	ND	ND	ND	ND	Various	Various
Polychlorinated biphenyls, PCB	ND	ND	ND	ND	ND	ND	ND	0.0002	0.0005

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater
(Page 18 of 19)

Well Name	GW-3	Lava Well 3	GW-5	Spud Well	GW-1	GW-4	GW-2	RL (mg/L, or as noted)	EPA MCL[1] (mg/L, or as noted)
Sample Name	GW-03-01	LAVA WELL-03-01	GW-05-01	SPUD WELL-01-01	GW-01-01	GW-4-01	GW-2-01		
Sample Date	4/08/09	4/07//09	4/08/09	4/06/09	4/07/09	4/07/09	4/06/09		
Analyte	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)	(mg/L, or as noted)		
Inorganic major cations and anions									
Bicarbonate	145	141	142	165	130	127	123	1	NS
Carbonate	<1	<1	<1	<1	<1	<1	<1	1	NS
Chloride	14.2	13.5	14.6	15.3	10.2	9.64	8.73	Various	250[4]
Cyanide (free)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2
Fluoride	0.887	0.900	0.911	0.777	0.898	0.905	0. 895	0.1	2[4]
Nitrate as N	1.36	1.35	1.40	1.53	1.43	1.47	1.56	0.05	10
Nitrite as N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	1
General Properties[6]									
pH (s.u.)	8.07	8.04	8.00	7.90	8.03	8.01	7.98	No RL	6.5 to 8.5[4]
Specific conductance µS/cm (umhos/cm)	340 (340)	400 (400)	370 (370)	440 (440)	350 (350)	350 (350)	280 (280)	1	NS
Sulfate as SO4	24.3	20.9	23.5	34.2	14.3	13.2	10.8	Various	250[4]
Total Alkalinity	145	141	142	165	130	127	123	1	NS
Total Dissolved Solids	270	228	264	292	207	201	204	10	500[4]
Total Organic Carbon	<1	1.78	<1	2.69	<1	1.03	<1	1	NS
Total Suspended Solids	<5	<5	<5	<5	<5	<5	<5	5	NS

Table 3.4-13 Chemical Analyses for the EREF Site Groundwater

NOTES:

Highlighted results exceed EPA MCL

1. EPA, 2006
2. BGS = Below ground surface when well was sampled.
3. Detection limit for aluminum above the lowest value of the secondary standard.
4. EPA secondary maximum contaminant levels (SMCLs) (EPA, 2006)
5. Action level requiring treatment (EPA, 2006)
6. Lab measurement

NA = Not analyzed due to bottle breakage
NM = Not measured
NS = No standard
s.u. = standard units
< Denotes result was less than the lab reporting limit (RL). The RL is the number following the less than sign
ND = Non-detect
VOC = Volatile Organic Compounds
SVOC = Semi-Volatile Organic Compounds
~~TPH = Total Petroleum Hydrocarbons~~
~~TOC = Total Organic Carbon~~
MCL = Maximum Contaminant Level
RL =Reporting Limit
~~S.U. = Standard units~~
PQL = Practical Quantitation Limit (see Organics)

7. LOWER VALUE APPLIES TO THE ND RESULTS; HIGHER VALUE APPLIES TO REMAINING RESULT (LAVA WELL-03-01)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater
(Page 1 of 19)[35]

Well Name	Lava Well 3				Spud Well				
Sample Date	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	
Sample Name	LAVA 3-01	LAVA 3-01	MDC	MDC	SPUD-1 (WELL ^5)	SPUD-1 (WELL ^5)	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	1.3E+00	4.7E-02	2.9E+00	1.1E-01	1.4E+00	5.3E-02	2.8E+00	1.0E-01	15 (0.55)
Gross Beta	**5.7E+00**	**2.1E-01**	3.3E+00	1.2E-01	**4.3E+00**	**1.6E-01**	3.2E+00	1.2E-01	15 (0.55)
Ag-108m	7.1E-01	2.6E-02	1.2E+00	4.4E-02	-1.0E-02	-3.7E-04	7.6E-01	2.8E-02	NS
Ag-110m	-7.7E-01	-2.8E-02	1.9E+00	7.0E-02	4.1E-01	1.5E-02	1.3E+00	4.8E-02	NS
Ba-140	1.1E+00	4.1E-02	8.7E+00	3.2E-01	-1.6E+00	-5.9E-02	6.1E+00	2.3E-01	NS
Be-7	-5.1E+00	-1.9E-01	1.5E+01	5.5E-01	9.0E-01	3.3E-02	1.0E+01	3.7E-01	NS
Ce-141	2.1E+00	7.6E-02	3.1E+00	1.1E-01	1.0E-01	3.7E-03	6.0E+00	2.2E-01	NS
Ce-144	-1.0E-01	-3.7E-03	7.1E+00	2.6E-01	2.4E+00	8.9E-02	5.4E+00	2.0E-01	NS
Co-57	3.8E-01	1.4E-02	1.6E+00	5.9E-02	5.6E-01	2.1E-02	7.0E-01	2.6E-02	NS
Co-58	-2.4E-01	-8.9E-03	1.8E+00	6.7E-02	1.0E-02	3.7E-04	1.2E+00	4.4E-02	NS
Co-60	6.0E-02	2.2E-03	1.5E+00	5.5E-02	2.0E-01	7.4E-03	1.0E+00	3.7E-02	NS
Cr-51	5.1E+00	1.9E-01	1.8E+01	6.7E-01	-4.3E+00	-1.6E-01	1.6E+01	5.9E-01	NS
Cs-134	-1.1E-01	-4.1E-03	1.5E+00	5.5E-02	-4.0E-01	-1.5E-02	1.0E+00	3.7E-02	NS
Cs-137	4.3E-01	1.6E-02	1.2E+00	4.4E-02	3.7E-01	1.4E-02	8.9E-01	3.3E-02	NS
Fe-59	-4.0E-01	-1.5E-02	4.3E+00	1.6E-01	-1.6E+00	-5.9E-02	3.0E+00	1.1E-01	NS
I-131	-2.8E+00	-1.0E-01	1.4E+01	5.2E-01	3.4E+00	1.3E-01	1.3E+01	4.8E-01	NS
K-40	-1.5E+00	-5.5E-02	3.1E+01	1.1E+00	1.4E+01	5.2E-01	3.5E+01	1.3E+00	NS
La-140	1.1E+00	4.1E-02	8.7E+00	3.2E-01	-1.6E+00	-5.9E-02	6.1E+00	2.3E-01	NS
Mn-54	-8.0E-02	-3.0E-03	1.4E+00	5.2E-02	6.0E-02	2.2E-03	9.7E-01	3.6E-02	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	Lava Well 3				Spud Well				
Sample Date	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	3/25/2008	
Sample Name	LAVA-3-01	LAVA-3-01	MDC	MDC	SPUD-1	SPUD-1	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Nb-95	-2.1E-01	-7.8E-03	2.3E+00	8.5E-02	9.6E-01	3.6E-02	1.7E+00	6.3E-02	NS
Ru-103	-3.7E-01	-1.4E-02	2.7E+00	1.0E-01	-9.8E-01	-3.6E-02	2.5E+00	9.2E-02	NS
Ru-106	9.0E-01	3.3E-02	1.1E+01	4.1E-01	-5.3E+00	-2.0E-01	9.4E+00	3.5E-01	NS
Sb-124	-2.2E+00	-8.1E-02	5.1E+00	1.9E-01	7.4E-01	2.7E-02	2.9E+00	1.1E-01	NS
Sb-125	-1.0E+00	-3.7E-02	3.6E+00	1.3E-01	6.8E-01	2.5E-02	2.4E+00	8.9E-02	NS
Se-75	-5.6E-01	-2.1E-02	1.7E+00	6.3E-02	-8.9E-01	-3.3E-02	1.3E+00	4.8E-02	NS
Zn-65	6.3E-01	2.3E-02	2.9E+00	1.1E-01	1.4E+00	5.3E-02	2.1E+00	7.8E-02	NS
Zr-95	-8.9E-01	-3.3E-02	3.2E+00	1.2E-01	-4.9E-01	-1.8E-02	2.2E+00	8.1E-02	NS
H-3	1.1E+02	4.1E+00	4.5E+02	1.7E+01	4.0E+01	1.5E+00	4.5E+02	1.7E+01	NS
Ra-224	-1.1E+04	-4.1E+02	6.5E+05	2.4E+04	0.0E+00	0.0E+00	4.5E+05	1.7E+04	NS
Ra-226	-3.7E-02	-1.4E-03	8.5E-01[3]	3.1E-02[3]	3.2E-01	1.2E-02	8.6E-01[3]	3.2E-02[3]	5 (0.18) [Ra-226+Ra-228][2]
Ra-228[4]	5.1E+00	1.9E-01	4.2E+00[3]	1.6E-01[3]	6.5E+00	2.4E-01	1.1E+01[3]	4.1E-01[3]	5 (0.18) - [Ra-226+Ra-228][2]
Th-228	1.0E-01	3.8E-03	2.9E-01	1.1E-02	1.2E-01	4.5E-03	1.6E-01	5.9E-03	NS
Th-230	8.5E-01	3.1E-02	4.7E-01	1.7E-02	9.0E-02	3.3E-03	4.1E-01	1.5E-02	NS
Th-232	2.6E-01	9.8E-03	6.5E-02	2.4E-03	2.0E-02	7.4E-04	5.5E-02	2.0E-03	NS
U-234	2.0E+00	7.5E-02	3.0E-01	1.1E-02	1.1E+00	3.9E-02	2.2E-01	8.1E-03	20 (0.74)
U-235	2.8E-01	1.0E-02	2.5E-01	9.2E-03	2.9E-01	1.1E-02	3.9E-01	1.4E-02	20 (0.74)
U-238	6.0E-01	2.2E-02	2.7E-01	1.0E-02	9.5E-01	3.5E-02	3.6E-01	1.3E-02	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

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Well Name	GW-3				GW-5				
Sample Name	GW-3-01	GW-3-01	MDC	MDC	GW-5-01	GW-5-01	MDC	MDC	EPA MCL[1]
Sample Date	5/20/2008	5/20/2008	5/20/2008	5/20/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	5.1E-01	1.9E-02	3.50E-00	1.3E-01	-5.4E-01	-2.0E-02	1.9E+00	7.0E-02	15 (0.55)
Gross Beta	**5.8E-00**	**2.1E-01**	3.7E-00	1.4E-01	9.5E-01	3.5E-02	2.8E+00	1.0E-01	15 (0.55)
Ag-108m	-5.0E-02	-1.8E-03	1.7E+00	6.3E-02	1.1E+00	4.1E-02	3.9E+00	1.4E-01	NS
Ag-110m	-8.0E-02	-3.0E-03	2.8E+00	1.0E-01	-1.1E+00	-4.1E-02	6.3E+00	2.3E-01	NS
Ba-140	-1.6E+00	-5.9E-02	7.1E+00	2.6E-01	4.0E+00	1.5E-01	9.4E+00	3.5E-01	NS
Be-7	2.8E+00	1.0E-01	1.8E+01	6.7E-01	-1.3E+01	-4.8E-01	4.4E+01	1.6E+00	NS
Ce-141	1.2E+00	4.6E-02	3.2E+00	1.2E-01	2.9E+00	1.1E-01	7.3E+00	2.7E-01	NS
Ce-144	-4.0E-01	-1.5E-02	8.8E+00	3.3E-01	1.5E+00	5.5E-02	2.7E+01	1.0E+00	NS
Co-57	1.0E-01	3.7E-03	1.1E+00	4.1E-02	2.0E-01	7.4E-03	3.4E+00	1.3E-01	NS
Co-58	-4.3E-01	-1.6E-02	2.4E+00	8.9E-02	1.6E+00	5.9E-02	4.8E+00	1.8E-01	NS
Co-60	1.1E-01	4.1E-03	2.6E+00	9.6E-02	2.1E+00	7.8E-02	5.1E+00	1.9E-01	NS
Cr-51	-7.3E+00	-2.7E-01	2.0E+01	7.4E-01	-2.6E+01	-9.6E-01	5.1E+01	1.9E+00	NS
Cs-134	2.1E-01	7.8E-03	1.9E+00	7.0E-02	2.0E-01	7.4E-03	4.8E+00	1.8E-01	NS
Cs-137	-7.8E-01	-2.9E-02	2.0E+00	7.4E-02	-1.0E-01	-3.7E-03	5.1E+00	1.9E-01	NS
Fe-59	-6.0E-01	-2.2E-02	5.4E+00	2.0E-01	0.0E+00	0.0E+00	1.1E+01	4.1E-01	NS
I-131	-7.0E-01	-2.6E-02	7.3E+00	2.7E-01	-5.9E+00	-2.2E-01	1.2E+01	4.4E-01	NS
K-40	-6.0E+00	-2.2E-01	5.7E+01	2.1E+00	-2.8E+01	-1.0E+00	7.9E+01	2.9E+00	NS
La-140	-1.6E+00	-5.9E-02	7.1E+00	2.6E-01	4.0E+00	1.5E-01	9.4E+00	3.5E-01	NS
Mn-54	-3.9E-01	-1.4E-02	2.1E+00	7.8E-02	3.2E+00	1.2E-01	3.8E+00	1.4E-01	NS
Nb-95	-1.3E+00	-4.7E-02	3.1E+00	1.1E-01	3.0E-01	1.1E-02	5.9E+00	2.2E-01	NS
Ru-103	-2.2E-01	-8.1E-03	3.4E+00	1.3E-01	-5.0E-01	-1.8E-02	5.0E+00	1.8E-01	NS
Ru-106	-1.3E+01	-4.9E-01	1.8E+01	6.7E-01	-2.8E+01	-1.0E+00	4.6E+01	1.7E+00	NS
Sb-124	6.0E-01	2.2E-02	6.7E+00	2.5E-01	-1.2E+00	-4.4E-02	1.3E+01	4.8E-01	NS
Sb-125	-4.0E-01	-1.5E-02	5.1E+00	1.9E-01	1.8E+00	6.7E-02	1.3E+01	4.8E-01	NS
Se-75	-2.4E+00	-8.9E-02	3.6E+00	1.3E-01	-8.0E-01	-3.0E-02	5.6E+00	2.1E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				GW-5				
Sample Name Sample Date	GW-3-01 5/20/2008	GW-3-01 5/20/2008	MDC 5/20/2008	MDC 5/20/2008	GW-5-01 6/19/2008	GW-5-01 6/19/2008	MDC 6/19/2008	MDC 6/19/2008	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Zn-65	7.0E-01	2.6E-02	9.1E+00	3.4E-01	1.9E+00	7.0E-02	1.9E+01	7.0E-01	NS
Zr-95	-4.0E-01	-1.5E-02	4.2E+00	1.6E-01	-7.0E-01	-2.6E-02	8.3E+00	3.1E-01	NS
H-3	5.3E+02	2.0E+01	4.3E+02	1.6E+01	2.8E+02	1.0E+01	4.3E+02	1.6E+01	NS
Ra-224	0E+00	0E+00	2.7E+05	1E+04	3.5E+02	1.3E+01	9.6E+02	3.6E+01	NS
Ra-226	-1.8E-02	-6.5E-04	1.6E-01[3]	5.9E-03[3]	-2.5E-02	-9.3E-04	1.4E-01[3]	5.2E-03[3]	5 (0.18) [Ra-226+Ra-228][2]
Ra-228[4]	8.9E+00	3.3E-01	1.5E+01[3]	5.6E-01[3]	-1E+00	-3.7E-02	2.1E+01[3]	7.8E-01[3]	5 (0.18) -[Ra-226+Ra-228][2]
Th-228	-2.9E-03	-1.1E-04	2.1E-02	7.8E-04	4.2E-03	1.6E-04	2.2E-02	8.1E-04	NS
Th-230	-2.6E-02	-9.6E-04	3.7E-02	1.4E-03	9.0E-03	3.3E-04	3.8E-02	1.4E-03	NS
Th-232	1.3E-02	4.8E-04	7.3E-03	2.7E-04	4.7E-02	1.7E-03	1.0E-02	3.7E-04	NS
U-234	1.4E+00	5.3E-02	6.6E-03	2.4E-04	6.5E-02	2.4E-03	2.4E-02	8.9E-04	20 (0.74)
U-235	3.7E-02	1.4E-03	1.6E-02	5.9E-04	7.6E-02	2.8E-03	2.3E-02	8.5E-04	20 (0.74)
U-238	6.4E-01	2.4E-02	2.4E-03	8.9E-05	6.7E-02	2.5E-03	2.1E-02	7.8E-04	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	Spud Well				Lava Well 3				
Sample Name	SPUD-01 WELL	SPUD-01 WELL	MDC	MDC	LAVA 03-01 WELL	LAVA 03-01 WELL	MDC	MDC	EPA MCL[1]
Sample Date	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	0.0E+00	0.0E+00	4.0E+00	1.5E-01	8.0E-01	3.0E-02	3.8E+00	1.4E-01	15 (0.55)
Gross Beta	**5.5E+00**	**2.0E-01**	2.8E+00	1.0E-01	**4.0E+00**	**1.5E-01**	3.3E+00	1.2E-01	15 (0.55)
Ag-108m	-1.5E+00	-5.5E-02	4.6E+00	1.7E-01	-1.2E+00	-4.4E-02	4.6E+00	1.7E-01	NS
Ag-110m	0.0E+00	0.0E+00	7.6E+00	2.8E-01	-7.0E-01	-2.6E-02	7.3E+00	2.7E-01	NS
Ba-140	-8.5E+00	-3.1E-01	1.4E+01	5.2E-01	3.6E+00	1.3E-01	1.0E+01	3.7E-01	NS
Be-7	3.0E+00	1.1E-01	4.6E+01	1.7E+00	-4.0E+00	-1.5E-01	4.2E+01	1.6E+00	NS
Ce-141	-5.2E+00	-1.9E-01	9.2E+00	3.4E-01	-6.5E+00	-2.4E-01	9.4E+00	3.5E-01	NS
Ce-144	5.0E+00	1.8E-01	2.8E+01	1.0E+00	-1.2E+00	-4.4E-02	2.9E+01	1.1E+00	NS
Co-57	-3.0E-01	-1.1E-02	3.6E+00	1.3E-01	0.0E+00	0.0E+00	3.8E+00	1.4E-01	NS
Co-58	5.0E-01	1.8E-02	5.6E+00	2.1E-01	-1.8E+00	-6.7E-02	5.9E+00	2.2E-01	NS
Co-60	-2.3E+00	-8.5E-02	6.5E+00	2.4E-01	1.0E+00	3.7E-02	5.2E+00	1.9E-01	NS
Cr-51	-1.3E+01	-4.8E-01	5.4E+01	2.0E+00	-3.0E+00	-1.1E-01	4.8E+01	1.8E+00	NS
Cs-134	-2.4E+00	-8.9E-02	6.1E+00	2.3E-01	2.4E+00	8.9E-02	4.9E+00	1.8E-01	NS
Cs-137	1.6E+00	5.9E-02	5.0E+00	1.8E-01	-2.9E+00	-1.1E-01	6.0E+00	2.2E-01	NS
Fe-59	4.7E+00	1.7E-01	1.1E+01	4.1E-01	-5.6E+00	-2.1E-01	1.2E+01	4.4E-01	NS
I-131	0.0E+00	0.0E+00	1.2E+01	4.4E-01	3.1E+00	1.1E-01	9.4E+00	3.5E-01	NS
K-40	6.0E+00	2.2E-01	8.3E+01	3.1E+00	-2.5E+01	-9.2E-01	8.2E+01	3.0E+00	NS
La-140	-8.5E+00	-3.1E-01	1.4E+01	5.2E-01	3.6E+00	1.3E-01	1.0E+01	3.7E-01	NS
Mn-54	-1.5E+00	-5.5E-02	5.6E+00	2.1E-01	-4.3E+00	-1.6E-01	6.3E+00	2.3E-01	NS
Nb-95	2.0E-01	7.4E-03	7.6E+00	2.8E-01	4.0E-01	1.5E-02	7.3E+00	2.7E-01	NS
Ru-103	8.0E-01	3.0E-02	6.3E+00	2.3E-01	2.7E+00	1.0E-01	5.6E+00	2.1E-01	NS
Ru-106	-2.3E+01	-8.5E-01	5.2E+01	1.9E+00	-1.8E+01	-6.7E-01	5.4E+01	2.0E+00	NS
Sb-124	-6.0E-01	-2.2E-02	1.3E+01	4.8E-01	2.6E+00	9.6E-02	1.2E+01	4.4E-01	NS
Sb-125	-5.3E+00	-2.0E-01	1.4E+01	5.2E-01	1.0E+00	3.7E-02	1.4E+01	5.2E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	Spud Well				Lava Well 3				
Sample Name	WELL SPUD-01	WELL SPUD-01	MDC	MDC	LAVA 03-01 WELL	LAVA 03-01 WELL	MDC	MDC	EPA MCL[1]
Sample Date	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	6/19/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Se-75	2.9E+00	1.1E-01	6.0E+00	2.2E-01	-2.0E+00	-7.4E-02	6.7E+00	2.5E-01	NS
Zn-65	-1.5E+00	-5.5E-02	2.0E+01	7.4E-01	-4.0E-01	-1.5E-02	1.6E+01	5.9E-01	NS
Zr-95	6.0E-01	2.2E-02	9.9E+00	3.7E-01	-1.5E+00	-5.5E-02	1.0E+01	3.7E-01	NS
H-3	2.4E+02	8.9E+00	4.2E+02	1.6E+01	3.2E+02	1.2E+01	4.3E+02	1.6E+01	NS
Ra-224	0.0E+00	0.0E+00	1.3E+03	4.8E+01	0.0E+00	0.0E+00	9.1E+02	3.4E+02	NS
Ra-226	4.7E-02	1.7E-03	1.5E-01[3]	5.5E-03[3]	-1.9E-02	-6.9E-04	1.2E-01[3]	4.4E-03[3]	5 (0.18) [Ra-226+Ra-228][2]
Ra-228[4]	1.8E+00	6.7E-02	2.2E+01[3]	8.1E-01[3]	-3E-01	-1.1E-02	2.3E+01[3]	8.5E-03[3]	5 (0.18) - [Ra-226+Ra-228][2]
Th-228	2.4E-03	8.9E-05	3.0E-02	1.1E-03	3.3E-02	1.2E-03	9.3E-02	3.4E-03	NS
Th-230	2.9E-01	1.1E-02	4.4E-02	1.6E-03	1.0E-01	3.7E-03	9.1E-02	3.4E-03	NS
Th-232	2.3E-02	8.4E-04	1.6E-02	5.9E-04	-5.3E-03	-2.0E-04	3.8E-02	1.4E-03	NS
U-234	1.6E+00	5.8E-02	1.2E-02	4.4E-04	1.8E+00	6.7E-02	1.5E-02	5.5E-04	20 (0.74)
U-235	4.1E-02	1.5E-03	8.6E-03	3.2E-04	5.6E-02	2.1E-03	1.2E-02	4.4E-04	20 (0.74)
U-238	7.3E-01	2.7E-02	1.0E-02	3.7E-04	7.4E-01	2.7E-02	8.4E-02	3.1E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	7/7/2008	7/7/2008	7/7/2008	7/7/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	-2.2E+00	-8.0E-02	3.1E-00	1.1E-01	-2.2E-01	-8.1E-03	3.9E+00	1.4E-01	15 (0.55)
Gross Beta	**3.0E+00**	**1.1E-01**	2.7E+00	1.0E-01	**4.7E+00**	**1.7E-01**	3.4E+00	1.3E-01	15 (0.55)
Ag-108m	-2.0E-01	-7.4E-03	3.5E+00	1.3E-01	-8.6E-01	-3.2E-02	2.9E+00	1.1E-01	NS
Ag-110m	4.6E+00	1.7E-01	5.3E+00	2.0E-01	-2.2E+00	-8.1E-02	5.3E+00	2.0E-01	NS
Ba-140	-1.9E+00	-7.0E-02	9.1E+00	3.4E-01	4.7E+00	1.7E-01	8.2E+00	3.0E-01	NS
Be-7	6.8E+00	2.5E-01	3.3E+01	1.2E+00	-1.7E+01	-6.1E-01	3.3E+01	1.2E+00	NS
Ce-141	1.9E+00	7.0E-02	4.1E+00	1.5E-01	5.0E-01	1.8E-02	7.7E+00	2.8E-01	NS
Ce-144	3.8E+00	1.4E-01	1.9E+01	7.0E-01	-6.7E+00	-2.5E-01	2.4E+01	8.9E-01	NS
Co-57	3.0E-01	1.1E-02	3.5E+00	1.3E-01	4.0E-01	1.5E-02	3.1E+00	1.1E-01	NS
Co-58	-1.7E+00	-6.3E-02	4.4E+00	1.6E-01	-1.4E+00	-5.2E-02	4.1E+00	1.5E-01	NS
Co-60	-5.0E-01	-1.8E-02	5.1E+00	1.9E-01	8.3E-01	3.1E-02	2.5E+00	9.2E-02	NS
Cr-51	-1.0E+00	-3.7E-02	3.6E+01	1.3E+00	-3.0E+00	-1.1E-01	4.0E+01	1.5E+00	NS
Cs-134	2.7E+00	1.0E-01	4.0E+00	1.5E-01	7.4E-01	2.7E-02	3.3E+00	1.2E-01	NS
Cs-137	1.5E+00	5.5E-02	4.0E+00	1.5E-01	-2.0E-02	-7.4E-04	3.5E+00	1.3E-01	NS
Fe-59	-3.0E-01	-1.1E-02	9.3E+00	3.4E-01	2.0E+00	7.4E-02	7.4E+00	2.7E-01	NS
I-131	-3.0E-01	-1.1E-02	7.9E+00	2.9E-01	-2.0E+00	-7.4E-02	1.4E+01	5.2E-01	NS
K-40	-2.9E+01	-1.1E+00	8.8E+01	3.3E+00	2.4E+01	8.9E-01	4.7E+01	1.7E+00	NS
La-140	-1.9E+00	-7.0E-02	9.1E+00	3.4E-01	4.7E+00	1.7E-01	8.2E+00	3.0E-01	NS
Mn-54	-9.1E-01	-3.4E-02	3.7E+00	1.4E-01	-1.6E+00	-5.9E-02	4.1E+00	1.5E-01	NS
Nb-95	0.0E+00	0.0E+00	4.5E+00	1.7E-01	2.0E+00	7.4E-02	4.2E+00	1.6E-01	NS
Ru-103	-2.7E+00	-1.0E-01	4.3E+00	1.6E-01	-1.4E+00	-5.2E-02	4.7E+00	1.7E-01	NS
Ru-106	-2.0E+00	-7.4E-02	3.7E+01	1.4E+00	-3.3E+00	-1.2E-01	3.6E+01	1.3E+00	NS
Sb-124	4.0E-01	1.5E-02	1.1E+01	4.1E-01	-5.0E-01	-1.8E-02	9.6E+00	3.6E-01	NS
Sb-125	-1.4E+00	-5.2E-02	1.1E+01	4.1E-01	2.1E+00	7.8E-02	8.7E+00	3.2E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	7/7/2008	7/7/2008	7/7/2008	7/7/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Se-75	2.0E-01	7.4E-03	4.2E+00	1.6E-01	-7.0E-01	-2.6E-02	4.6E+00	1.7E-01	NS
Zn-65	-4.0E+00	-1.5E-01	1.1E+01	4.1E-01	-6.4E+00	-2.4E-01	9.5E+00	3.5E-01	NS
Zr-95	1.1E+00	4.1E-02	7.1E+00	2.6E-01	2.0E-01	7.4E-03	7.0E+00	2.6E-01	NS
H-3	-1.2E+02	-4.4E+00	4.3E+02	1.6E+01	-7.0E+01	-2.6E+00	4.3E+02	1.6E+01	NS
Ra-224	0.0E+00	0.0E+00	6.3E+01	2.3E+00	0.0E+00	0.0E+00	4.7E+02	1.7E+01	NS
Ra-226	4.1E-02	1.5E-03	1.9E-01[3]	7.0E-03[3]	1.2E-01	4.4E-03	2.9E-01[3]	1.1E-02[3]	5 (0.18) [Ra-226+Ra-228][2]
Ra-228[4]	1.1E+01	4.1E-01	1.3E+01[3]	4.8E-01[3]	1.8E+00	6.7E-02	1.2E+01[3]	4.4E-02[3]	5 (0.18) - [Ra-226+Ra-228][2]
Th-228	9.0E-04	3.3E-05	2.2E-02	8.1E-04	-2.7E-02	-1.0E-03	2.0E-01	7.40E-03	NS
Th-230	6.0E-03	2.2E-04	4.1E-02	1.5E-03	2.4E-01	8.9E-03	1.9E-01	7.03E-03	NS
Th-232	4.9E-03	1.8E-04	1.1E-02	4.1E-04	2E-03	7.4E-05	8.8E-02	3.26E-03	NS
U-234	1.6E+00	6.1E-02	1.8E-02	6.7E-04	1.5E-00	5.5E-02	5.3E-02	1.96E-03	20 (0.74)
U-235	4.2E-02	1.5E-03	2.0E-02	7.4E-04	1.4E-02	5.2E-04	8.0E-02	2.96E-03	20 (0.74)
U-238	6.8E-01	2.5E-02	1.6E-02	5.9E-04	5.5E-01	2.0E-02	6.8E-02	2.52E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	7/10/2008	7/10/2008	7/10/2008	7/10/2008	
Radioactive Constituent					
Gross Alpha	4.8E-01	1.8E-02	3.7E+00	1.4E-01	15 (0.55)
Gross Beta	**5.0E+00**	**1.9E-01**	3.3E+00	1.2E-01	15 (0.55)
Ag-108m	1.7E-01	6.3E-03	2.3E+00	8.5E-02	NS
Ag-110m	-3.0E-01	-1.1E-02	4.0E+00	1.5E-01	NS
Ba-140	-7.5E+00	-2.8E-01	1.3E+01	4.8E-01	NS
Be-7	-9.6E+00	-3.6E-01	2.9E+01	1.1E+00	NS
Ce-141	4.0E-01	1.5E-02	5.9E+00	2.2E-01	NS
Ce-144	2.1E+00	7.8E-02	1.7E+01	6.3E-01	NS
Co-57	-1.3E-01	-4.8E-03	2.1E+00	7.8E-02	NS
Co-58	-2.0E+00	-7.4E-02	3.6E+00	1.3E-01	NS
Co-60	7.2E-01	2.7E-02	3.3E+00	1.2E-01	NS
Cr-51	-6.0E+00	-2.2E-01	3.5E+01	1.3E+00	NS
Cs-134	6.5E-01	2.4E-02	3.0E+00	1.1E-01	NS
Cs-137	4.6E-01	1.7E-02	3.1E+00	1.1E-01	NS
Fe-59	3.7E+00	1.4E-01	7.5E+00	2.8E-01	NS
I-131	-3.2E+00	-1.2E-01	1.4E+01	5.2E-01	NS
K-40	-4.0E+00	-1.5E-01	4.3E+01	1.6E+00	NS
La-140	-7.5E+00	-2.8E-01	1.3E+01	4.8E-01	NS
Mn-54	-1.6E-01	-5.9E-03	2.8E+00	1.0E-01	NS
Nb-95	2.0E-01	7.4E-03	3.7E+00	1.4E-01	NS
Ru-103	-1.5E+00	-5.5E-02	3.9E+00	1.4E-01	NS
Ru-106	-1.1E+01	-4.0E-01	3.0E+01	1.1E+00	NS
Sb-124	1.2E+00	4.4E-02	8.3E+00	3.1E-01	NS
Sb-125	0.0E+00	0.0E+00	7.4E+00	2.7E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name / Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	7/10/2008	7/10/2008	7/10/2008	7/10/2008	
Se-75	0.0E+00	0.0E+00	3.6E+00	1.3E-01	NS
Zn-65	1.9E+00	7.0E-02	6.5E+00	2.4E-01	NS
Zr-95	2.4E+00	8.9E-02	5.4E+00	2.0E-01	NS
H-3	1.8E+02	7.6E+00	4.3E+02	1.6E+01	NS
Ra-224	1E+01	3.7E-01	8.6E+02	3.18E+01	NS
Ra-226	-3.8E-02	-1.4E-03	2.5E-01 [3]	9.2E-03 [3]	5 (0.18) -[Ra-226+Ra-228][2]
Ra-228 [4]	9E-01	3.3E-02	1.2E+01 [3]	4.4E-01 [3]	5 (0.18) -[Ra-226+Ra-228][2]
Th-228	-2.0E-03	-7.40E-05	9.2E-02	3.40E-03	NS
Th-230	-2.6E-02	-9.62E-04	1.3 E-01	4.81E-03	NS
Th-232	0E+00	0.00E+00	2.8E-02	1.04E-03	NS
U-234	**1.1E+00**	**4.07E-02**	6.7E-02	2.48E-03	20 (0.74)
U-235	2.5E-02	9.25E-04	7.6E-02	2.81E-03	20 (0.74)
U-238	**6.6E-01**	**2.44E-02**	6.4E-02	2.37E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				Lava Well				
Sample Date	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	
Sample Name	GW-03-01	GW-03-01	MDC	MDC	WELL LAVA 03-01	WELL LAVA 03-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	-1.08E+00	-4.00E-02	3.80E+00	1.41E-01	3.90E-01	1.44E-02	4.00E+00	1.48E-01	15 (0.55)
Gross Beta	4.76E+00	1.76E-01	2.20E+00	8.14E-02	5.10E+00	1.89E-01	3.40E+00	1.26E-01	15 (0.55)
Ag-108m	0.00E+00	0.00E+00	3.10E+00	1.15E-01	1.48E+00	5.48E-02	2.80E+00	1.04E-01	NS
Ag-110m	7.00E-01	2.59E-02	4.40E+00	1.63E-01	1.20E+00	4.44E-02	4.50E+00	1.66E-01	NS
Ba-140	2.60E+00	9.62E-02	1.20E+01	4.44E-01	-3.10E+00	-1.15E-01	1.20E+01	4.44E-01	NS
Be-7	2.20E+01	8.14E-01	3.30E+01	1.22E+00	6.30E+00	2.33E-01	2.80E+01	1.04E+00	NS
Ce-141	2.00E+00	7.40E-02	6.30E+00	2.33E-01	-3.00E+00	-1.11E-01	7.30E+00	2.70E-01	NS
Ce-144	6.60E+00	2.44E-01	1.80E+01	6.66E-01	1.90E+00	7.03E-02	2.30E+01	8.51E-01	NS
Co-57	-6.20E-01	-2.29E-02	2.40E+00	8.88E-02	-9.90E-01	-3.66E-02	2.90E+00	1.07E-01	NS
Co-58	-2.00E-01	-7.40E-03	4.30E+00	1.59E-01	-1.30E+00	-4.81E-02	3.90E+00	1.44E-01	NS
Co-60	0.00E+00	0.00E+00	4.90E+00	1.81E-01	-3.10E-01	-1.15E-02	3.40E+00	1.26E-01	NS
Cr-51	3.00E+00	1.11E-01	3.60E+01	1.33E+00	9.00E-01	3.33E-02	3.30E+01	1.22E+00	NS
Cs-134	-1.27E+00	-4.70E-02	3.60E+00	1.33E-01	-4.80E-01	-1.78E-02	3.20E+00	1.18E-01	NS
Cs-137	-1.30E+00	-4.81E-02	4.50E+00	1.66E-01	5.60E-01	2.07E-02	3.30E+00	1.22E-01	NS
Fe-59	-1.20E+00	-4.44E-02	1.00E+01	3.70E-01	-4.00E+00	-1.48E-01	8.00E+00	2.96E-01	NS
I-131	1.40E+00	5.18E-02	1.50E+01	5.55E-01	-4.30E+00	-1.59E-01	1.30E+01	4.81E-01	NS
K-40	8.00E+00	2.96E-01	5.30E+01	1.96E+00	-4.00E+00	-1.48E-01	4.80E+01	1.78E+00	NS
La-140	2.60E+00	9.62E-02	1.20E+01	4.44E-01	-3.10E+00	-1.15E-01	1.20E+01	4.44E-01	NS
Mn-54	-1.50E+00	-5.55E-02	4.40E+00	1.63E-01	1.04E+00	3.85E-02	3.10E+00	1.15E-01	NS
Nb-95	0.00E+00	0.00E+00	6.00E+00	2.22E-01	-1.70E+00	-6.29E-02	5.10E+00	1.89E-01	NS
Ru-103	1.00E-01	3.70E-03	4.60E+00	1.70E-01	-1.60E+00	-5.92E-02	4.50E+00	1.66E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				Lava Well				
Sample Date	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	
Sample Name	GW-03-01	GW-03-01	MDC	MDC	WELL LAVA 03-01	WELL LAVA 03-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Ru-106	1.07E+01	3.96E-01	2.90E+01	1.07E+00	-3.80E+00	-1.41E-01	3.20E+01	1.18E+00	NS
Sb-124	1.90E+00	7.03E-02	1.00E+01	3.70E-01	3.10E+00	1.15E-01	9.00E+00	3.33E-01	NS
Sb-125	-6.00E-01	-2.22E-02	1.00E+01	3.70E-01	1.30E+00	4.81E-02	8.10E+00	3.00E-01	NS
Se-75	2.00E-01	7.40E-03	4.30E+00	1.59E-01	-4.00E-01	-1.48E-02	4.30E+00	1.59E-01	NS
Zn-65	1.90E+00	7.03E-02	8.20E+00	3.03E-01	3.70E+00	1.37E-01	6.30E+00	2.33E-01	NS
Zr-95	7.00E-01	2.59E-02	7.70E+00	2.85E-01	-9.00E-01	-3.33E-02	6.30E+00	2.33E-01	NS
H-3	5.00E+01	1.85E+00	4.30E+02	1.59E+01	-3.00E+01	-1.11E+00	4.30E+02	1.59E+01	NS
Ra-224	**2.06E+02**	**7.62E+00**	1.70E+02	6.29E+00	-9.00E+00	-3.33E-01	1.10E+02	4.07E+00	NS
Ra-226	5.00E-02	1.85E-03	4.70E-01	1.74E-02	6.60E-02	2.44E-03	3.70E-01	1.37E-02	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	1.30E+00	4.81E-02	3.70E+00	1.37E-01	-4.00E+01	1.48E-02	2.90E+00	1.07E-01	5 (0.18) -[Ra-226+Ra-228][2]
Th-228	1.61E-01	5.96E-03	1.70E-01	6.29E-03	1.80E-02	6.66E-04	1.30E-01	4.81E-03	NS
Th-230	1.60E-02	5.92E-04	1.60E-01	5.92E-03	-5.60E-02	-2.07E-03	1.30E-01	4.81E-03	NS
Th-232	2.60E-02	9.62E-04	5.20E-02	1.92E-03	2.80E-02	1.04E-03	4.30E-02	1.59E-03	NS
U-234	**1.54E+00**	**5.70E-02**	2.60E-02	9.62E-04	**1.54E+00**	**5.70E-02**	3.80E-02	1.41E-03	20 (0.74)
U-235	**3.60E-02**	**1.33E-03**	3.20E-02	1.18E-03	**3.80E-02**	**1.41E-03**	3.70E-02	1.37E-03	20 (0.74)
U-238	**6.44E-01**	**2.38E-02**	5.20E-02	1.92E-03	**5.33E-01**	**1.97E-02**	3.60E-02	1.33E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-5				Spud Well				
Sample Name Sample Date	GW-05-01 9/30/2008	GW-05-01 9/30/2008	MDC 9/30/2008	MDC 9/30/2008	SPUD WELL-01~~-01~~ 9/30/2008	SPUD WELL-01~~-01~~ 9/30/2008	MDC 9/30/2008	MDC 9/30/2008	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	4.20E-01	1.55E-02	3.10E+00	1.15E-01	-1.18E+00	-4.37E-02	3.80E+00	1.41E-01	15 (0.55)
Gross Beta	**4.22E+00**	**1.56E-01**	2.80E+00	1.04E-01	**4.64E+00**	**1.72E-01**	2.10E+00	7.77E-02	15 (0.55)
Ag-108m	-6.60E-01	-2.44E-02	3.30E+00	1.22E-01	-9.40E-01	-3.48E-02	3.70E+00	1.37E-01	NS
Ag-110m	4.00E-01	1.48E-02	5.70E+00	2.11E-01	1.40E+00	5.18E-02	5.80E+00	2.15E-01	NS
Ba-140	-6.10E+00	-2.26E-01	1.50E+01	5.55E-01	-2.50E+00	-9.25E-02	1.20E+01	4.44E-01	NS
Be-7	-9.70E+00	-3.59E-01	3.50E+01	1.29E+00	-4.00E+00	-1.48E-01	3.90E+01	1.44E+00	NS
Ce-141	2.30E+00	8.51E-02	6.60E+00	2.44E-01	1.50E+00	5.55E-02	6.90E+00	2.55E-01	NS
Ce-144	1.20E+01	4.44E-01	2.10E+01	7.77E-01	8.20E+00	3.03E-01	2.40E+01	8.88E-01	NS
Co-57	-7.40E-01	-2.74E-02	2.70E+00	9.99E-02	1.90E-01	7.03E-03	3.30E+00	1.22E-01	NS
Co-58	-5.00E-01	-1.85E-02	4.40E+00	1.63E-01	8.00E-01	2.96E-02	4.50E+00	1.66E-01	NS
Co-60	-4.00E-01	-1.48E-02	4.70E+00	1.74E-01	-1.00E+00	-3.70E-02	5.90E+00	2.18E-01	NS
Cr-51	1.10E+01	4.07E-01	4.00E+01	1.48E+00	-5.00E+00	-1.85E-01	4.30E+01	1.59E+00	NS
Cs-134	6.30E-01	2.33E-02	3.80E+00	1.41E-01	-1.70E-01	-6.29E-03	4.20E+00	1.55E-01	NS
Cs-137	-8.00E-01	-2.96E-02	3.90E+00	1.44E-01	2.00E-01	7.40E-03	4.10E+00	1.52E-01	NS
Fe-59	8.00E-01	2.96E-02	9.80E+00	3.63E-01	-1.00E+00	-3.70E-02	1.10E+01	4.07E-01	NS
I-131	3.60E+00	1.33E-01	1.20E+01	4.44E-01	-2.90E+00	-1.07E-01	1.40E+01	5.18E-01	NS
K-40	-1.30E+01	-4.81E-01	6.30E+01	2.33E+00	1.30E+01	4.81E-01	6.70E+01	2.48E+00	NS
La-140	-6.10E+00	-2.26E-01	1.50E+01	5.55E-01	-2.50E+00	-9.25E-02	1.20E+01	4.44E-01	NS
Mn-54	-2.00E-01	-7.40E-03	3.80E+00	1.41E-01	-4.00E-01	-1.48E-02	4.80E+00	1.78E-01	NS
Nb-95	1.30E+00	4.81E-02	4.30E+00	1.59E-01	6.00E-01	2.22E-02	5.20E+00	1.92E-01	NS
Ru-103	-2.90E+00	-1.07E-01	5.10E+00	1.89E-01	-1.60E+00	-5.92E-02	5.50E+00	2.03E-01	NS
Ru-106	-7.00E+00	-2.59E-01	4.00E+01	1.48E+00	0.00E+00	0.00E+00	3.40E+01	1.26E+00	NS
Sb-124	3.80E+00	1.41E-01	1.30E+01	4.81E-01	-8.00E-01	-2.96E-02	1.30E+01	4.81E-01	NS
Sb-125	-2.00E+00	-7.40E-02	1.10E+01	4.07E-01	1.10E+00	4.07E-02	1.10E+01	4.07E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-5				Spud Well				
Sample Name	GW-05-01	GW-05-01	MDC	MDC	SPUD WELL-01-01	SPUD WELL-01-01	MDC	MDC	EPA MCL[1]
Sample Date	9/30/2008	9/30/2008	9/30/2008	9/30/2008	9/30/2008	9/30/2008	9/30/2008	9/30/2008	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Se-75	1.80E+00	6.66E-02	4.20E+00	1.55E-01	0.00E+00	0.00E+00	5.20E+00	1.92E-01	NS
Zn-65	-2.60E+00	-9.62E-02	9.20E+00	3.40E-01	-2.40E+00	-8.88E-02	1.10E+01	4.07E-01	NS
Zr-95	-1.00E-01	-3.70E-03	8.00E+00	2.96E-01	-5.00E-01	-1.85E-02	9.40E+00	3.48E-01	NS
H-3	-1.60E+02	-5.92E+00	4.30E+02	1.59E+01	-9.00E+01	-3.33E+00	4.30E+02	1.59E+01	NS
Ra-224	2.40E+01	8.88E-01	7.20E+01	2.66E+00	8.10E+01	3.00E+00	1.70E+02	6.29E+00	NS
Ra-226	-1.64E-01	-6.07E-03	4.50E-01	1.66E-02	-9.50E-02	-3.51E-03	4.60E-01	1.70E-02	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	-3.30E-01	-1.22E-02	3.10E+00	1.15E-01	1.60E+00	5.92E-02	3.50E+00	1.29E-01	5 (0.18) - [Ra-226+Ra-228][2]
Th-228	-3.36E-02	-1.24E-03	9.00E-02	3.33E-03	-4.00E-03	-1.48E-04	1.20E-01	4.44E-03	NS
Th-230	-2.30E-02	-8.51E-04	1.30E-01	4.81E-03	8.00E-03	2.96E-04	1.50E-01	5.55E-03	NS
Th-232	9.90E-03	3.66E-04	2.70E-02	9.99E-04	3.20E-02	1.18E-03	6.00E-02	2.22E-03	NS
U-234	**1.85E+00**	**6.84E-02**	4.00E-02	1.48E-03	**1.39E+00**	**5.14E-02**	4.80E-02	1.78E-03	20 (0.74)
U-235	**6.40E-02**	**2.37E-03**	5.90E-02	2.18E-03	3.40E-02	1.26E-03	4.60E-02	1.70E-03	20 (0.74)
U-238	**1.05E+00**	**3.89E-02**	2.50E-02	9.25E-04	**6.98E-01**	**2.58E-02**	4.40E-02	1.63E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	9/30/08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08	10/1/08	10/1/08	pCi/L (Bq/L)
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	
Radioactive Constituent									
Gross Alpha	-1.89E+00	-6.99E-02	3.30E+00	1.22E-01	**3.40E+00**	**1.26E-01**	3.30E+00	1.22E-01	15 (0.55)
Gross Beta	**3.22E+00**	**1.19E-01**	2.00E+00	7.40E-02	**7.80E+00**	**2.89E-01**	3.40E+00	1.26E-01	15 (0.55)
Ag-108m	1.17E+00	4.33E-02	3.00E+00	1.11E-01	2.00E-01	7.40E-03	3.10E+00	1.15E-01	NS
Ag-110m	-3.00E-01	-1.11E-02	4.80E+00	1.78E-01	-2.00E-01	-7.40E-03	5.30E+00	1.96E-01	NS
Ba-140	5.80E+00	2.15E-01	1.00E+01	3.70E-01	-5.00E-01	-1.85E-02	8.60E+00	3.18E-01	NS
Be-7	1.00E+00	3.70E-02	3.60E+01	1.33E+00	1.01E+01	3.74E-01	2.80E+01	1.04E+00	NS
Ce-141	-1.00E-01	-3.70E-03	6.10E+00	2.26E-01	-4.20E+00	-1.55E-01	8.10E+00	3.00E-01	NS
Ce-144	1.80E+00	6.66E-02	1.80E+01	6.66E-01	6.90E+00	2.55E-01	2.20E+01	8.14E-01	NS
Co-57	5.90E-01	2.18E-02	2.40E+00	8.88E-02	7.10E-01	2.63E-02	2.90E+00	1.07E-01	NS
Co-58	5.00E-01	1.85E-02	4.50E+00	1.66E-01	-1.00E+00	-3.70E-02	4.50E+00	1.66E-01	NS
Co-60	-6.00E-01	-2.22E-02	4.60E+00	1.70E-01	-1.40E+00	-5.18E-02	4.30E+00	1.59E-01	NS
Cr-51	2.00E+00	7.40E-02	3.70E+01	1.37E+00	4.00E+00	1.48E-01	4.00E+01	1.48E+00	NS
Cs-134	-8.10E-01	-3.00E-02	3.40E+00	1.26E-01	-1.03E+00	-3.81E-02	3.80E+00	1.41E-01	NS
Cs-137	1.70E+00	6.29E-02	3.60E+00	1.33E-01	9.00E-02	3.33E-03	3.60E+00	1.33E-01	NS
Fe-59	4.00E-01	1.48E-02	9.50E+00	3.51E-01	-3.90E+00	-1.44E-01	9.40E+00	3.48E-01	NS
I-131	5.90E+00	2.18E-01	1.30E+01	4.81E-01	-4.40E+00	-1.63E-01	1.40E+01	5.18E-01	NS
K-40	-1.10E+01	-4.07E-01	6.50E+01	2.40E+00	-1.60E+01	-5.92E-01	5.70E+01	2.11E+00	NS
La-140	5.80E+00	2.15E-01	1.00E+01	3.70E-01	-5.00E-01	-1.85E-02	8.60E+00	3.18E-01	NS
Mn-54	3.00E-01	1.11E-02	3.70E+00	1.37E-01	-1.00E+00	-3.70E-02	4.20E+00	1.55E-01	NS
Nb-95	9.00E-01	3.33E-02	4.90E+00	1.81E-01	-1.70E+00	-6.29E-02	5.30E+00	1.96E-01	NS
Ru-103	-6.00E-01	-2.22E-02	5.10E+00	1.89E-01	-1.80E+00	-6.66E-02	5.50E+00	2.03E-01	NS
Ru-106	6.10E+00	2.26E-01	3.00E+01	1.11E+00	-2.00E+00	-7.40E-02	3.60E+01	1.33E+00	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	9/30/08	9/30/08	9/30/08	9/30/08	10/1/08	10/1/08	10/1/08	10/1/08	pCi/L (Bq/L)
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	
Sb-124	-5.20E+00	-1.92E-01	1.50E+01	5.55E-01	-4.90E+00	-1.81E-01	1.30E+01	4.81E-01	NS
Sb-125	3.00E+00	1.11E-01	9.80E+00	3.63E-01	-2.10E+00	-7.77E-02	9.90E+00	3.66E-01	NS
Se-75	1.70E+00	6.29E-02	4.10E+00	1.52E-01	5.00E-01	1.85E-02	5.00E+00	1.85E-01	NS
Zn-65	-1.60E+00	-5.92E-02	8.30E+00	3.07E-01	1.10E+00	4.07E-02	7.80E+00	2.89E-01	NS
Zr-95	-1.90E+00	-7.03E-02	8.90E+00	3.29E-01	-2.20E+00	-8.14E-02	8.30E+00	3.07E-01	NS
H-3	-1.20E+02	-4.44E+00	4.30E+02	1.59E+01	-5.00E+01	-1.85E+00	4.30E+02	1.59E+01	NS
Ra-224	0.00E+00	0.00E+00	1.40E+02	5.18E+00	-3.00E+00	-1.11E-01	1.20E+02	4.44E+00	NS
Ra-226	-6.60E-02	-2.44E-03	4.30E-01	1.59E-02	1.30E-01	4.81E-03	5.30E-01	1.96E-02	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	-1.10E-01	-4.07E-02	2.70E+00	9.99E-02	1.80E+00	6.66E-02	3.00E+00	1.11E-01	5 (0.18) - [Ra-226+Ra-228][2]
Th-228	1.00E-03	3.70E-05	8.40E-02	3.11E-03	1.40E-02	5.18E-04	7.60E-02	2.81E-03	NS
Th-230	0.00E+00	0.00E+00	1.30E-01	4.81E-03	3.30E-02	1.22E-03	1.30E-01	4.81E-03	NS
Th-232	1.70E-02	6.29E-04	4.50E-02	1.66E-03	-1.78E-02	-6.59E-04	7.00E-02	2.59E-03	NS
U-234	1.84E+00	6.81E-02	5.50E-02	2.03E-03	1.53E+00	5.66E-02	8.00E-02	2.96E-03	20 (0.74)
U-235	1.08E-01	4.00E-03	5.50E-02	2.03E-03	8.30E-02	3.07E-03	8.30E-02	3.07E-03	20 (0.74)
U-238	7.56E-01	2.80E-02	4.20E-02	1.55E-03	6.09E-01	2.25E-02	7.30E-02	2.70E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	10/1/2008	10/1/2008	10/1/2008	10/1/2008	
Radioactive Constituent					
Gross Alpha	1.70E+00	6.29E-02	3.40E+00	1.26E-01	15 (0.55)
Gross Beta	2.44E+00	9.03E-02	3.00E+00	1.11E-01	15 (0.55)
Ag-108m	0.00E+00	0.00E+00	3.20E+00	1.18E-01	NS
Ag-110m	-4.00E-01	-1.48E-02	5.40E+00	2.00E-01	NS
Ba-140	-1.10E+00	-4.07E-02	1.20E+01	4.44E-01	NS
Be-7	-9.10E+00	-3.37E-01	3.70E+01	1.37E+00	NS
Ce-141	-1.10E+00	-4.07E-02	8.50E+00	3.14E-01	NS
Ce-144	1.80E+00	6.66E-02	2.60E+01	9.62E-01	NS
Co-57	-1.90E-01	-7.03E-03	3.40E+00	1.26E-01	NS
Co-58	5.00E-01	1.85E-02	4.00E+00	1.48E-01	NS
Co-60	1.90E+00	7.03E-02	3.90E+00	1.44E-01	NS
Cr-51	-1.30E+01	-4.81E-01	4.70E+01	1.74E+00	NS
Cs-134	4.00E-01	1.48E-02	4.00E+00	1.48E-01	NS
Cs-137	1.10E+00	4.07E-02	3.70E+00	1.37E-01	NS
Fe-59	-5.00E-01	-1.85E-02	9.60E+00	3.55E-01	NS
I-131	8.00E-01	2.96E-02	1.30E+01	4.81E-01	NS
K-40	-1.20E+01	-4.44E-01	6.00E+01	2.22E+00	NS
La-140	-1.10E+00	-4.07E-02	1.20E+01	4.44E-01	NS
Mn-54	1.02E+00	3.77E-02	3.30E+00	1.22E-01	NS
Nb-95	-1.00E-01	-3.70E-03	5.00E+00	1.85E-01	NS
Ru-103	7.00E-01	2.59E-02	5.00E+00	1.85E-01	NS
Ru-106	-1.80E+01	-6.66E-01	4.30E+01	1.59E+00	NS
Sb-124	-3.30E+00	-1.22E-01	1.00E+01	3.70E-01	NS
Sb-125	2.80E+00	1.04E-01	1.00E+01	3.70E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater
(Page 18 of 19)

Well Name	GW-2				
Sample Name / Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	10/1/2008	10/1/2008	10/1/2008	10/1/2008	
Se-75	-2.00E+00	-7.40E-02	5.70E+00	2.11E-01	NS
Zn-65	3.40E+00	1.26E-01	1.60E+01	5.92E-01	NS
Zr-95	1.40E+00	5.18E-02	6.80E+00	2.52E-01	NS
H-3	-1.40E+02	-5.18E+00	4.30E+02	1.59E+01	NS
Ra-224	-9.80E-01	-3.63E-02	5.20E+01	1.92E+00	NS
Ra-226	5.00E-02	1.85E-03	2.40E-01	8.88E-03	5 (0.18) -[Ra-226+Ra-228][2]
Ra-228	1.30E+00	4.81E-02	2.40E+00	8.88E-02	5 (0.18) -[Ra-226+Ra-228][2]
Th-228	-1.55E-02	-5.73E-04	6.30E-02	2.33E-03	NS
Th-230	-3.30E-02	-1.22E-03	1.20E-01	4.44E-03	NS
Th-232	-8.60E-04	-3.18E-05	3.30E-02	1.22E-03	NS
U-234	**1.42E+00**	**5.25E-02**	4.10E-02	1.52E-03	20 (0.74)
U-235	**1.17E-01**	**4.33E-03**	5.00E-02	1.85E-03	20 (0.74)
U-238	**6.44E-01**	**2.38E-02**	4.80E-02	1.78E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	Lava Well 3				Spud Well				
Sample Date	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/5/2009	1/5/2009	1/5/2009	1/5/2009	
Sample Name	LAVA WELL 03-01	LAVA WELL 03-01	MDC	MDC	SPUD WELL 01-01	SPUD WELL 01-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	6.20E-01	2.29E-02	3.30E+00	1.22E-01	1.44E+00	5.33E-02	3.10E+00	1.15E-01	15 (0.55)
Gross Beta	**4.40E+00**	**1.63E-01**	3.30E+00	1.22E-01	**6.00E+00**	**2.22E-01**	2.90E+00	1.07E-01	15 (0.55)
Ag-108m	1.72E+00	6.36E-02	2.10E+00	7.77E-02	-2.50E-01	-9.25E-03	3.00E+00	1.11E-01	NS
Ag-110m	2.20E+00	8.14E-02	3.40E+00	1.26E-01	-1.90E+00	-7.03E-02	5.50E+00	2.03E-01	NS
Ba-140	-7.00E-01	-2.59E-02	8.60E+00	3.18E-01	-4.70E+00	-1.74E-01	1.30E+01	4.81E-01	NS
Be-7	-3.70E+00	-1.37E-01	3.10E+01	1.15E+00	6.70E+00	2.48E-01	3.30E+01	1.22E+00	NS
Ce-141	5.00E-01	1.85E-02	5.70E+00	2.11E-01	1.40E+00	5.18 E-02	6.50E+00	2.40E-01	NS
Ce-144	2.10E+00	7.77 E-02	2.00E+01	7.40E-01	4.40E+00	1.63E-01	2.00E+01	7.40E-01	NS
Co-57	-5.00E-01	-1.85E-02	2.50E+00	9.25E-02	-5.70E-01	-2.11E-02	2.70E+00	9.99E-02	NS
Co-58	9.00E-01	3.33E-02	2.70E+00	9.99E-02	-2.20E-01	-8.14E-03	3.70E+00	1.37E-01	NS
Co-60	-6.00E-01	-2.22E-02	3.10E+00	1.15E-01	-2.00E-01	-7.40E-03	4.30E+00	1.59E-01	NS
Cr-51	-7.00E-01	-2.59E-02	3.20E+01	1.18E+00	3.00E+00	1.11E-01	4.20E+01	1.55E+00	NS
Cs-134	-5.00E-02	-1.85E-03	2.60E+00	9.62E-02	1.40E-01	5.18E-03	3.30E+00	1.22E-01	NS
Cs-137	-5.20E-01	-1.92E-02	2.80E+00	1.04E-01	1.08E+00	4.00E-02	3.10E+00	1.15E-01	NS
Fe-59	1.40E+00	5.18E-02	6.10E+00	2.26E-01	-2.60E+00	-9.62E-02	1.00E+01	3.70E-01	NS
I-131	-7.60E+00	-2.81E-01	1.20E+01	4.44E-01	-7.00E-01	-2.59E-02	1.40E+01	5.18 E-01	NS
K-40	-9.00E+00	-3.33E-01	4.30E+01	1.59E+00	1.10E+01	4.07 E-01	4.30E+01	1.59E+00	NS
La-140	-7.00E-01	-2.59E-02	8.60E+00	3.18E-01	-4.70E+00	-1.74E-01	1.30E+01	4.81E-01	NS
Mn-54	-2.70E-01	-9.99E-03	2.80E+00	1.04E-01	-2.80E-01	-1.04E-02	3.00E+00	1.11E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	Lava Well 3				Spud Well				
Sample Date	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/5/2009	1/5/2009	1/5/2009	1/5/2009	
Sample Name	LAVA WELL 03-01	LAVA WELL 03-01	MDC	MDC	SPUD WELL 01-01	SPUD WELL 01-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Nb-95	-2.30E+00	-8.51E-02	4.30E+00	1.59E-01	1.40E+00	5.18E-02	4.10E+00	1.52E-01	NS
Ru-103	-7.00E-01	-2.59E-02	3.90E+00	1.44E-01	-1.40E+00	-5.18E-02	4.40E+00	1.63E-01	NS
Ru-106	-7.00E-01	-2.59E-02	2.80E+01	1.04E+00	3.60E+00	1.33E-01	3.40E+01	1.26E+00	NS
Sb-124	-7.00E-01	-2.59E-02	8.90E+00	3.29E-01	1.70E+00	6.29E-02	1.10E+01	4.07E-01	NS
Sb-125	1.90E+00	7.03E-02	7.20E+00	2.66E-01	3.00E+00	1.11E-01	8.20E+00	3.03E-01	NS
Se-75	1.30E+00	4.81E-02	3.80E+00	1.41E-01	-2.00E-01	-7.40E-03	4.10E+00	1.52E-01	NS
Zn-65	-1.10E+00	-4.07E-02	6.40E+00	2.37E-01	-2.30E+00	-8.51E-02	8.60E+00	3.18E-01	NS
Zr-95	-1.40E+00	-5.18E-02	5.80E+00	2.15E-01	-6.00E-01	-2.22E-02	6.40E+00	2.37E-01	NS
H-3	1.50E+02	5.55E+00	4.30E+02	1.59E+01	9.00E+01	3.33E+00	4.30E+02	1.59E+01	NS
Ra-224	**1.36E+00**	**5.03E-02**	5.60E-01	2.07E-02	**4.20E-01**	**1.55E-02**	3.80E-01	1.41E-02	NS
Ra-226	2.60E-02	9.62E-04	2.40E-01	8.88E-03	5.90E-02	2.18E-03	2.70E-01	9.99E-03	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	-1.39E+00	-5.15E-02	3.00E+00	1.11E-01	4.60E-01	1.70E-02	2.70E+00	9.99E-02	5 (0.18) [Ra-226+Ra-228][2]
Th-228	**3.88E-01**	**1.44E-02**	5.50E-02	2.03E-03	1.00E-03	3.70E-05	1.50E-01	5.55E-03	NS
Th-230	-5.00E-02	-1.85E-03	1.90E-01	7.03E-03	1.27E-01	4.70E-03	1.80E-01	6.66E-03	NS
Th-232	**3.00E-02**	**1.11E-03**	2.70E-02	9.99E-04	**6.00E-02**	**2.22E-03**	4.90E-02	1.81E-03	NS
U-234	**1.31E+00**	**4.85E-02**	4.90E-02	1.81E-03	**1.35E+00**	**4.99E-02**	4.30E-02	1.59E-03	20 (0.74)
U-235	**7.00E-02**	**2.59E-03**	3.20E-02	1.18E-03	6.30E-02	2.33E-03	6.80E-02	2.52E-03	20 (0.74)
U-238	**5.66E-01**	**2.09E-02**	4.20E-02	1.55E-03	**7.02E-01**	**2.60E-02**	6.00E-02	2.22E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				GW-5				
Sample Name	GW-03-01	GW-03-01	MDC	MDC	GW-05-01	GW-05-01	MDC	MDC	EPA MCL[1]
Sample Date	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/8/2009	1/8/2009	1/8/2009	1/8/2009	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	1.70E+00	6.29E-02	3.20E+00	1.18E-01	5.10E-01	1.89E-02	3.20E+00	1.18E-01	15 (0.55)
Gross Beta	**4.00E+00**	**1.48E-01**	3.10E+00	1.15E-01	**4.20E+00**	**1.55E-01**	3.10E+00	1.15E-01	15 (0.55)
Ag-108m	1.82E+00	6.73E-02	3.10E+00	1.15E-01	2.30E-01	8.51E-03	2.80E+00	1.04E-01	NS
Ag-110m	1.20E+00	4.44E-02	4.70E+00	1.74E-01	0.00E+00	0.00E+00	4.90E+00	1.81E-01	NS
Ba-140	0.00E+00	0.0E+00	1.10E+01	4.07E-01	6.10E+00	2.26E-01	8.00E+00	2.96E-01	NS
Be-7	3.30E+00	1.22E-01	3.10E+01	1.15E+00	8.00E+00	2.96E-01	2.90E+01	1.07E+00	NS
Ce-141	2.80E+00	1.04E-01	6.80E+00	2.52E-01	6.00E-01	2.22E-02	6.10E+00	2.26E-01	NS
Ce-144	4.70E+00	1.74E-01	2.30E+01	8.51E-01	4.70E+00	1.74E-01	2.00E+01	7.40E-01	NS
Co-57	7.30E-01	2.70E-02	3.20E+00	1.18E-01	3.70E-01	1.37E-02	2.50E+00	9.25E-02	NS
Co-58	-9.00E-01	-3.33E-02	4.30E+00	1.59E-01	-8.80E-01	-3.26E-02	3.80E+00	1.41E-01	NS
Co-60	-8.00E-01	-2.96E-02	4.30E+00	1.59E-01	-8.50E-01	-3.14E-02	3.90E+00	1.44E-01	NS
Cr-51	2.30E+01	8.51E-01	3.60E+01	1.33E+00	8.00E+00	2.96E-01	3.60E+01	1.33E+00	NS
Cs-134	-4.30E-01	-1.59E-02	3.70E+00	1.37E-01	-6.00E-01	-2.22E-02	3.90E+00	1.44E-01	NS
Cs-137	1.40E-01	5.18E-03	3.50E+00	1.29E-01	-1.00E-01	-3.70E-03	3.50E+00	1.29E-01	NS
Fe-59	0.00E+00	0.0E+00	8.00E+00	2.96E-01	-1.30E+00	-4.81E-02	8.70E+00	3.22E-01	NS
I-131	-2.50E+00	-9.25E-02	1.40E+01	5.18E-01	-3.00E+00	-1.11E-01	1.40E+01	5.18E-01	NS
K-40	8.00E+00	2.96E-01	4.20E+01	1.55E+00	**4.80E+01**	**1.78E+00**	4.70E+01	1.74E+00	NS
La-140	0.00E+00	0.0E+00	1.10E+01	4.07E-01	6.10E+00	2.26E-01	8.00E+00	2.96E-01	NS
Mn-54	-9.90E-01	-3.66E-02	3.60E+00	1.33E-01	-6.40E-01	-2.37E-02	3.20E+00	1.18E-01	NS
Nb-95	-1.50E+00	-5.55E-02	4.70E+00	1.74E-01	-9.00E-01	-3.33E-02	4.80E+00	1.78E-01	NS
Ru-103	-1.00E+00	-3.70E-02	4.80E+00	1.78E-01	-2.80E+00	-1.04E-01	4.70E+00	1.74E-01	NS
Ru-106	-9.30E+00	-3.44E-01	3.70E+01	1.37E+00	-3.70E+00	-1.37E-01	3.00E+01	1.11E+00	NS
Sb-124	-2.20E+00	-8.14E-02	1.10E+01	4.07E-01	-5.00E-01	-1.85E-02	9.00E+00	3.33E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				GW-5				
Sample Name Sample Date	GW-03-01 1/7/2009	GW-03-01 1/7/2009	MDC 1/7/2009	MDC 1/7/2009	GW-05-01 1/8/2009	GW-05-01 1/8/2009	MDC 1/8/2009	MDC 1/8/2009	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Sb-125	1.40E+00	5.18E-02	9.60E+00	3.55E-01	-1.20E+00	-4.44E-02	9.20E+00	3.40E-01	NS
Se-75	1.70E+00	6.29E-02	4.50E+00	1.66E-01	-2.40E+00	-8.88E-02	4.30E+00	1.59E-01	NS
Zn-65	3.40E+00	1.26E-01	7.50E+00	2.77E-01	1.00E+00	3.70E-02	1.50E+01	5.55E-01	NS
Zr-95	-3.60E+00	-1.33E-01	7.40E+00	2.74E-01	4.60E+00	1.70E-01	5.10E+00	1.89E-01	NS
H-3	-5.00E+01	-1.85E+00	4.30E+02	1.59E+01	1.60E+02	5.92E+00	4.40E+02	1.63E+01	NS
Ra-224	2.80E-01	1.04E-02	3.80E-01	1.41E-02	**2.10E+00**	**7.77E-02**	7.10E-01	2.63E-02	NS
Ra-226	7.40E-02	2.74E-03	2.70E-01	9.99E-03	1.80E-02	6.66E-04	2.40E-01	8.88E-03	5 (0.18) [Ra-226+Ra-228] [2]
Ra-228	1.25E+00	4.62E-02	2.50E+00	9.25E-02	-3.00E-01	-1.11E-02	2.70E+00	9.99E-02	5 (0.18) [Ra-226+Ra-228] [2]
Th-228	1.30E-02	4.81E-04	1.20E-01	4.44E-03	**5.36E-01**	**1.98E-02**	1.60E-01	5.92E-03	NS
Th-230	2.30E-02	8.51E-04	1.80E-01	6.66E-03	7.10E-02	2.63E-03	2.30E-01	8.51E-03	NS
Th-232	1.60E-02	5.92E-04	4.10E-02	1.52E-03	**7.60E-02**	**2.81E-03**	2.90E-02	1.07E-03	NS
U-234	**1.54E+00**	**5.70E-02**	9.40E-02	3.48E-03	**1.30E+00**	**4.81E-02**	4.30E-02	1.59E-03	20 (0.74)
U-235	3.30E-02	1.22E-03	6.60E-02	2.44E-03	**5.90E-02**	**2.18E-03**	4.60E-02	1.70E-03	20 (0.74)
U-238	**5.18E-01**	**1.92E-02**	4.60E-02	1.70E-03	**6.15E-01**	**2.28E-02**	4.30E-02	1.59E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	-1.13E+00	-4.18E-02	3.20E+00	1.18E-01	1.84E+00	6.81E-02	2.60E+00	9.62E-02	15 (0.55)
Gross Beta	3.00E+00	1.11E-01	3.30E+00	1.22E-01	**5.40E+00**	**2.00E-01**	3.20E+00	1.18E-01	15 (0.55)
Ag-108m	2.60E-01	9.62E-03	3.00E+00	1.11E-01	-9.00E-02	-3.33E-03	2.80E+00	1.04E-01	NS
Ag-110m	1.80E+00	6.66E-02	4.90E+00	1.81E-01	3.00E-01	1.11E-02	4.70E+00	1.74E-01	NS
Ba-140	-3.50E+00	-1.29E-01	1.40E+01	5.18E-01	2.90E+00	1.07E-01	1.10E+01	4.07E-01	NS
Be-7	1.09E+01	4.03E-01	3.20E+01	1.18E+00	-4.60E+00	-1.70E-01	3.10E+01	1.15E+00	NS
Ce-141	-3.40E+00	-1.26E-01	7.00E+00	2.59E-01	1.80E+00	6.66E-02	5.00E+00	1.85E-01	NS
Ce-144	1.48E+01	5.48E-01	2.00E+01	7.40E-01	-3.50E+00	-1.29E-01	1.60E+01	5.92E-01	NS
Co-57	3.80E-01	1.41E-02	2.50E+00	9.25E-02	-1.70E-01	-6.29E-03	2.00E+00	7.40E-02	NS
Co-58	-1.06E+00	-3.92E-02	3.90E+00	1.44E-01	2.00E-01	7.40E-03	4.10E+00	1.52E-01	NS
Co-60	-2.00E-01	-7.40E-03	4.80E+00	1.78E-01	8.00E-01	2.96E-02	4.00E+00	1.48E-01	NS
Cr-51	6.00E+00	2.22E-01	3.60E+01	1.33E+00	-3.50E+00	-1.29E-01	3.20E+01	1.18E+00	NS
Cs-134	6.10E-01	2.26E-02	3.20E+00	1.18E-01	1.25E+00	4.62E-02	3.30E+00	1.22E-01	NS
Cs-137	1.00E-01	3.70E-03	3.80E+00	1.41E-01	-4.00E-01	-1.48E-02	3.70E+00	1.37E-01	NS
Fe-59	2.80E+00	1.04E-01	7.90E+00	2.92E-01	2.80E+00	1.04E-01	9.10E+00	3.37E-01	NS
I-131	2.90E+00	1.07E-01	1.30E+01	4.81E-01	-4.00E+00	-1.48E-01	1.30E+01	4.81E-01	NS
K-40	2.00E+00	7.40E-02	5.60E+01	2.07E+00	1.10E+01	4.07E-01	6.40E+01	2.37E+00	NS
La-140	-3.50E+00	-1.29E-01	1.40E+01	5.18E-01	2.90E+00	1.07E-01	1.10E+01	4.07E-01	NS
Mn-54	-6.80E-01	-2.52E-02	3.80E+00	1.41E-01	2.00E-01	7.40E-03	3.50E+00	1.29E-01	NS
Nb-95	-9.00E-01	-3.33E-02	5.20E+00	1.92E-01	1.60E+00	5.92E-02	4.20E+00	1.55E-01	NS
Ru-103	0.00E+00	0.00E+00	4.20E+00	1.55E-01	-1.90E+00	-7.03E-02	4.30E+00	1.59E-01	NS
Ru-106	1.50E+01	5.55E-01	3.30E+01	1.22E+00	1.10E+01	4.07E-01	3.20E+01	1.18E+00	NS
Sb-124	-1.20E+00	-4.44E-02	1.10E+01	4.07E-01	-6.00E-01	-2.22E-02	1.10E+01	4.07E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	1/6/2009	
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Sb-125	-3.00E-01	-1.11E-02	9.00E+00	3.33E-01	-4.80E+00	-1.78E-01	8.50E+00	3.14E-01	NS
Se-75	4.00E-01	1.48E-02	4.10E+00	1.52E-01	1.20E+00	4.44E-02	3.60E+00	1.33E-01	NS
Zn-65	-4.50E+00	-1.66E-01	9.60E+00	3.55E-01	-7.10E+00	-2.63E-01	1.20E+01	4.44E-01	NS
Zr-95	-1.20E+00	-4.44E-02	6.40E+00	2.37E-01	1.00E-01	3.70E-03	6.40E+00	2.37E-01	NS
H-3	-6.00E+01	-2.22E+00	4.30E+02	1.59E+01	3.10E+02	1.15E+01	4.30E+02	1.59E+01	NS
Ra-224	**6.30E-01**	**2.33E-02**	3.40E-01	1.26E-02	2.70E-01	9.99E-03	3.70E-01	1.37E-02	NS
Ra-226	-3.90E-02	-1.44E-03	2.60E-01	9.62E-03	-3.90E-02	1.44E-03	1.90E-01 [3]	7.03E-03 [3]	5 (0.18) [Ra-226+Ra-228] [2]
Ra-228	1.30E-01	4.81E-03	2.60E+00	9.62E-02	-4.60E+00	-1.70E-01	9.30E+00 [3]	3.44E-01 [3]	5 (0.18) [Ra-226+Ra-228] [2]
Th-228	2.40E-02	8.88E-04	1.20E-01	4.44E-03	-1.26E-01	-4.66E-03	2.50E-01	9.25E-03	NS
Th-230	3.00E-03	1.11E-04	1.80E-01	6.66E-03	1.86E-01	6.88E-03	2.20E-01	8.14E-03	NS
Th-232	6.60E-03	2.44E-04	4.10E-02	1.52E-03	**0.00E+00**	**0.00E+00**	8.00E-02	2.96E-03	NS
U-234	**9.66E-01**	**3.57E-02**	6.70E-02	2.48E-03	**1.31E+00**	**4.85E-02**	9.10E-02	3.37E-03	20 (0.74)
U-235	**1.08E-01**	**4.00E-03**	6.00E-02	2.22E-03	**1.24E-01**	**4.59E-03**	8.50E-02	3.14E-03	20 (0.74)
U-238	**3.93E-01**	**1.45E-02**	5.20E-02	1.92E-03	**6.23E-01**	**2.30E-02**	6.90E-02	2.55E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	1/8/2009	1/8/2009	1/8/2009	1/8/2009	
Radioactive Constituent					
Gross Alpha	1.19E+00	4.40E-02	3.20E+00	1.18E-01	15 (0.55)
Gross Beta	**4.30E+00**	**1.59E-01**	3.30E+00	1.22E-01	15 (0.55)
Ag-108m	-3.00E-01	-1.11E-02	3.60E+00	1.33E-01	NS
Ag-110m	-2.70E+00	-9.99E-02	6.50E+00	2.40E-01	NS
Ba-140	-3.40E+00	-1.26E-01	1.30E+01	4.81E-01	NS
Be-7	-7.00E+00	-2.59E-01	3.80E+01	1.41E+00	NS
Ce-141	-2.00E-01	-7.40E-03	7.10E+00	2.63E-01	NS
Ce-144	5.60E+00	2.07E-01	2.30E+01	8.51E-01	NS
Co-57	-2.08E+00	-7.70E-02	3.10E+00	1.15E-01	NS
Co-58	2.00E-01	7.40E-03	4.40E+00	1.63E-01	NS
Co-60	-2.70E+00	-9.99E-02	4.90E+00	1.81E-01	NS
Cr-51	1.00E+00	3.70E-02	3.90E+01	1.44E+00	NS
Cs-134	-1.93E+00	-7.14E-02	4.90E+00	1.81E-01	NS
Cs-137	-3.00E-01	-1.11E-02	4.10E+00	1.52E-01	NS
Fe-59	-2.10E+00	-7.77E-02	1.20E+01	4.44E-01	NS
I-131	3.80E+00	1.41E-01	1.40E+01	5.18E-01	NS
K-40	-4.00E+00	-1.48E-01	5.50E+01	2.03E+00	NS
La-140	-3.40E+00	-1.26E-01	1.30E+01	4.81E-01	NS
Mn-54	2.00E-01	7.40E-03	3.80E+00	1.41E-01	NS
Nb-95	2.00E-01	7.40E-03	5.40E+00	2.00E-01	NS
Ru-103	-1.20E+00	-4.44E-02	5.00E+00	1.85E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	1/8/2009	1/8/2009	1/8/2009	1/8/2009	
Ru-106	-1.00E+01	-3.70E-01	4.30E+01	1.59E+00	NS
Sb-124	-1.60E+00	-5.92E-02	1.50E+01	5.55E-01	NS
Sb-125	-1.20E+00	-4.44E-02	1.10E+01	4.07E-01	NS
Se-75	3.00E-01	1.11E-02	4.80E+00	1.78E-01	NS
Zn-65	-6.80E+00	-2.52E-01	1.30E+01	4.81E-01	NS
Zr-95	2.20E+00	8.14E-02	7.50E+00	2.77E-01	NS
H-3	6.00E+01	2.22E+00	4.30E+02	1.59E+01	NS
Ra-224	**1.11E+00**	**4.11E-02**	3.70E-01	1.37E-02	NS
Ra-226	5.10E-02	1.89E-03	2.30E-01	8.51E-03	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	-2.10E+00	-7.77E-02	4.70E+00	1.74E-01	5 (0.18) [Ra-226+Ra-228][2]
Th-228	6.10E-02	2.26E-03	1.10E-01	4.07E-03	NS
Th-230	1.45E-01	5.36E-03	1.90E-01	7.03E-03	NS
Th-232	-3.00E-03	-1.11E-04	7.30E-02	2.70E-03	NS
U-234	**1.26E+00**	**4.66E-02**	7.80E-02	2.89E-03	20 (0.74)
U-235	3.10E-02	1.15E-03	8.50E-02	3.14E-03	20 (0.74)
U-238	**5.59E-01**	**2.07E-02**	6.40E-02	2.37E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				Lava Well				
Sample Date	4/08/2009	4/08/2009	4/08/2009	4/08/2009	4/07/2009	4/07/2009	4/07/2009	4/07/2009	
Sample Name	GW-03-01	GW-03-01	MDC	MDC	LAVA WELL 03-01	LAVA WELL 03-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	-1.08E+00	-4.00E-02	3.40E+00	1.26E-01	8.60E-01	3.18E-02	3.00E+00	1.11E-01	15 (0.55)
Gross Beta	2.80E+00	1.04E-01	3.10E+00	1.15E-01	**4.30E+00**	**1.59E-01**	3.10E+00	1.15E-01	15 (0.55)
Ag-108m	-1.16E+00	-4.29E-02	3.00E+00	1.11E-01	1.55E+00	5.73E-02	3.10E+00	1.15E-01	NS
Ag-110m	1.90E+00	7.03E-02	4.60E+00	1.70E-01	1.10E+00	4.07E-02	6.70E+00	2.48E-01	NS
Ba-140	0.00E+00	0.00E+00	1.00E+01	3.70E-01	2.40E+00	8.88E-02	1.10E+01	4.07E-01	NS
Be-7	-7.70E+00	-2.85E-01	3.20E+01	1.18E+00	-1.70E+01	-6.29E-01	4.00E+01	1.48E+00	NS
Ce-141	4.00E-01	1.48E-02	5.90E+00	2.18E-01	2.00E-01	7.40E-03	7.90E+00	2.92E-01	NS
Ce-144	-7.70E+00	-2.85E-01	2.10E+01	7.77E-01	5.90E+00	2.18E-01	2.70E+01	9.99E-01	NS
Co-57	4.40E-01	1.63E-02	2.60E+00	9.62E-02	9.00E-01	3.33E-02	3.40E+00	1.26E-01	NS
Co-58	-5.00E-01	-1.85E-02	3.90E+00	1.44E-01	-6.00E-01	-2.22E-02	4.90E+00	1.81E-01	NS
Co-60	-1.40E+00	-5.18E-02	4.80E+00	1.78E-01	-5.00E-01	-1.85E-02	4.30E+00	1.59E-01	NS
Cr-51	0.00E+00	0.00E+00	4.00E+01	1.48E+00	4.00E+00	1.48E-01	4.20E+01	1.55E+00	NS
Cs-134	2.60E+00	9.62E-02	3.40E+00	1.26E-01	-5.20E-01	-1.92E-02	4.90E+00	1.81E-01	NS
Cs-137	-2.00E+00	-7.40E-02	4.30E+00	1.59E-01	-5.00E-01	-1.85E-02	4.30E+00	1.59E-01	NS
Fe-59	1.90E+00	7.03E-02	8.20E+00	3.03E-01	5.00E-01	1.85E-02	1.00E+01	3.70E-01	NS
I-131	9.00E-01	3.33E-02	1.00E+01	3.70E-01	2.30E+00	8.51E-02	1.30E+01	4.81E-01	NS
K-40	-1.00E+01	-3.70E-01	4.90E+01	1.81E+00	2.00E+00	7.40E-02	5.60E+01	2.07E+00	NS
La-140	0.00E+00	0.00E+00	1.00E+01	3.70E-01	2.40E+00	8.88E-02	1.10E+01	4.07E-01	NS
Mn-54	2.00E-01	7.40E-03	3.10E+00	1.15E-01	-2.00E-01	-7.40E-03	4.20E+00	1.55E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-3				Lava Well				
Sample Date	4/08/2009	4/08/2009	4/08/2009	4/08/2009	4/07/2009	4/07/2009	4/07/2009	4/07/2009	
Sample Name	GW-03-01	GW-03-01	MDC	MDC	LAVA WELL 03-01	LAVA WELL 03-01	MDC	MDC	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Nb-95	0.00E+00	0.00E+00	3.90E+00	1.44E-01	1.70E+00	6.29E-02	5.40E+00	2.00E-01	NS
Ru-103	-2.50E+00	-9.25E-02	4.80E+00	1.78E-01	-1.40E+00	-5.18E-02	5.40E+00	2.00E-01	NS
Ru-106	-2.70E+00	-9.99E-02	3.50E+01	1.29E+00	-1.00E+01	-3.70E-01	4.30E+01	1.59E+00	NS
Sb-124	-5.50E+00	-2.03E-01	1.30E+01	4.81E-01	1.30E+00	4.81E-02	1.10E+01	4.07E-01	NS
Sb-125	3.10E+00	1.15E-01	8.80E+00	3.26E-01	-5.10E+00	-1.89E-01	1.20E+01	4.44E-01	NS
Se-75	4.00E-01	1.48E-02	3.90E+00	1.44E-01	-1.60E+00	-5.92E-02	5.60E+00	2.07E-01	NS
Zn-65	4.10E+00	1.52E-01	1.40E+01	5.18E-01	-4.30E+00	-1.59E-01	1.00E+01	3.70E-01	NS
Zr-95	-1.00E-01	-3.70E-03	6.50E+00	2.40E-01	1.00E+00	3.70E-02	7.10E+00	2.63E-01	NS
H-3	2.00E+01	7.40E-01	4.30E+02	1.59E+01	4.00E+01	1.48E+00	4.30E+02	1.59E+01	NS
Ra-224	0.00E+00	0.00E+00	4.30E+01	1.59E+00	2.90E-01	1.07E-02	4.10E-01	1.52E-02	NS
Ra-226	1.30E-01	4.81E-03	2.80E-01	1.04E-02	1.09E-01	4.03E-03	2.60E-01	9.62E-03	5 (0.18) [Ra-226+Ra-228] [2]
Ra-228	3.50E-01	1.29E-02	2.90E+00	1.07E-01	-1.60E+00	-5.92E-02	4.60E+00	1.70E-01	5 (0.18) [Ra-226+Ra-228] [2]
Th-228	7.60E-02	2.81E-03	1.70E-01	6.29E-03	**5.36E-01**	**1.98E-02**	1.10E-01	4.07E-03	NS
Th-230	-1.18E-01	-4.37E-03	2.70E-01	9.99E-03	-7.60E-02	-2.81E-03	2.00E-01	7.40E-03	NS
Th-232	4.00E-03	1.48E-04	1.00E-01	3.70E-03	2.20E-02	8.14E-04	3.00E-02	1.11E-03	NS
U-234	**1.27E+00**	**4.70E-02**	1.60E-01	5.92E-03	**1.62E+00**	**5.99E-02**	1.30E-01	4.81E-03	20 (0.74)
U-235	3.50E-02	1.29E-03	1.70E-01	6.29E-03	5.60E-02	2.07E-03	1.20E-01	4.44E-03	20 (0.74)
U-238	**6.50E-01**	**2.40E-02**	1.50E-01	5.55E-03	**6.10E-01**	**2.26E-02**	1.00E-01	3.70E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-5				Spud Well				
Sample Name Sample Date	GW-05-01 4/08/2009	GW-05-01 4/08/2009	MDC 4/08/2009	MDC 4/08/2009	SPUD WELL 01-01 4/06/2009	SPUD WELL 01-01 4/06/2009	MDC 4/06/2009	MDC 4/06/2009	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Radioactive Constituent									
Gross Alpha	-8.60E-01	-3.18E-02	3.00E+00	1.11E-01	6.70E-01	2.48E-02	3.20E+00	1.18E-01	15 (0.55)
Gross Beta	**4.40E+00**	**1.63E-01**	3.20E+00	1.18E-01	**3.40E+00**	**1.26E-01**	3.30E+00	1.22E-01	15 (0.55)
Ag-108m	1.24E+00	4.59E-02	2.90E+00	1.07E-01	1.31E+00	4.85E-02	2.90E+00	1.07E-01	NS
Ag-110m	1.10E+00	4.07E-02	4.90E+00	1.81E-01	-3.00E-01	-1.11E-02	6.60E+00	2.44E-01	NS
Ba-140	1.00E+00	3.70E-02	1.10E+01	4.07E-01	1.40E+00	5.18E-02	1.10E+01	4.07E-01	NS
Be-7	1.28E+01	4.74E-01	2.90E+01	1.07E+00	-1.00E+00	-3.70E-02	3.90E+01	1.44E+00	NS
Ce-141	-2.00E-01	-7.40E-03	7.00E+00	2.59E-01	4.70E+00	1.74E-01	6.80E+00	2.52E-01	NS
Ce-144	-6.10E+00	-2.26E-01	2.20E+01	8.14E-01	2.30E+00	8.51E-02	2.30E+01	8.51E-01	NS
Co-57	3.80E-01	1.41E-02	2.80E+00	1.04E-01	2.07E+00	7.66E-02	2.80E+00	1.04E-01	NS
Co-58	-1.10E+00	-4.07E-02	4.60E+00	1.70E-01	-2.20E+00	-8.14E-02	4.80E+00	1.78E-01	NS
Co-60	1.10E+00	4.07E-02	4.40E+00	1.63E-01	2.20E+00	8.14E-02	4.20E+00	1.55E-01	NS
Cr-51	9.40E+00	3.48E-01	3.30E+01	1.22E+00	-1.10E+01	-4.07E-01	4.50E+01	1.66E+00	NS
Cs-134	-8.60E-01	-3.18E-02	4.00E+00	1.48E-01	4.70E-01	1.74E-02	4.10E+00	1.52E-01	NS
Cs-137	2.00E-01	7.40E-03	3.80E+00	1.41E-01	-9.00E-01	-3.33E-02	4.90E+00	1.81E-01	NS
Fe-59	1.30E+00	4.81E-02	9.00E+00	3.33E-01	-4.70E+00	-1.74E-01	1.20E+01	4.44E-01	NS
I-131	1.50E+00	5.55E-02	1.10E+01	4.07E-01	-3.50E+00	-1.29E-01	1.40E+01	5.18E-01	NS
K-40	-6.00E+00	-2.22E-01	5.40E+01	2.00E+00	-2.00E+01	-7.40E-01	6.60E+01	2.44E+00	NS
La-140	1.00E+00	3.70E-02	1.10E+01	4.07E-01	1.40E+00	5.18E-02	1.10E+01	4.07E-01	NS
Mn-54	4.50E-01	1.66E-02	3.50E+00	1.29E-01	4.00E-01	1.48E-02	4.10E+00	1.52E-01	NS
Nb-95	0.00E+00	0.00E+00	4.80E+00	1.78E-01	-1.90E+00	-7.03E-02	5.60E+00	2.07E-01	NS
Ru-103	-3.60E+00	-1.33E-01	5.10E+00	1.89E-01	3.00E-01	1.11E-02	4.40E+00	1.63E-01	NS
Ru-106	7.00E+00	2.59E-01	3.50E+01	1.29E+00	1.00E+00	3.70E-02	4.00E+01	1.48E+00	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-5				Spud Well				
Sample Name Sample Date	GW-05-01 4/08/2009	GW-05-01 4/08/2009	MDC 4/08/2009	MDC 4/08/2009	SPUD WELL 01-01 4/06/2009	SPUD WELL 01-01 4/06/2009	MDC 4/06/2009	MDC 4/06/2009	EPA MCL[1]
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	pCi/L (Bq/L)
Sb-124	-1.40E+00	-5.18E-02	1.30E+01	4.81E-01	-4.30E+00	-1.59E-01	1.50E+01	5.55E-01	NS
Sb-125	-1.70E+00	-6.29E-02	9.40E+00	3.48E-01	-7.00E-01	-2.59E-02	9.50E+00	3.51E-01	NS
Se-75	2.50E+00	9.25E-02	3.80E+00	1.41E-01	2.00E-01	7.40E-03	4.30E+00	1.59E-01	NS
Zn-65	-9.00E-01	-3.33E-02	1.10E+01	4.07E-01	-1.30E+00	-4.81E-02	9.30E+00	3.44E-01	NS
Zr-95	1.40E+00	5.18E-02	7.50E+00	2.77E-01	-4.00E-01	-1.48E-02	8.60E+00	3.18E-01	NS
H-3	1.60E+02	5.92E+00	4.30E+02	1.59E+01	3.00E+01	1.11E+00	4.30E+02	1.59E+01	NS
Ra-224	4.50E+01	1.66E+00	6.10E+01	2.26E+00	-1.15E+01	-4.25E-01	1.20E+02	4.44E+00	NS
Ra-226	2.07E-01	7.66E-03	2.50E-01	9.25E-03	3.70E-01	1.37E-02	4.00E-01	1.48E-02	5 (0.18) [Ra-226+Ra-228] [2]
Ra-228	-3.00E-01	-1.11E-02	4.60E+00	1.70E-01	2.00E-01	7.40E-03	3.70E+00	1.37E-01	5 (0.18) [Ra-226+Ra-228] [2]
Th-228	2.90E-02	1.07E-03	1.70E-01	6.29E-03	9.30E-02	3.44E-03	2.00E-01	7.40E-03	NS
Th-230	-2.30E-02	-8.51E-04	2.70E-01	9.99E-03	-1.31E-01	-4.85E-03	2.20E-01	8.14E-03	NS
Th-232	1.60E-02	5.92E-04	7.30E-02	2.70E-03	1.70E-02	6.29E-04	8.10E-02	3.00E-03	NS
U-234	**1.54E+00**	**5.70E-02**	1.30E-01	4.81E-03	**1.58E+00**	**5.85E-02**	1.20E-01	4.44E-03	20 (0.74)
U-235	4.90E-02	1.81E-03	9.50E-02	3.51E-03	6.70E-02	2.48E-03	1.40E-01	5.18E-03	20 (0.74)
U-238	**5.90E-01**	**2.18E-02**	1.10E-01	4.07E-03	**3.87E-01**	**1.43E-02**	9.60E-02	3.55E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	pCi/L (Bq/L)
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	
Radioactive Constituent									
Gross Alpha	-7.00E-02	-2.59E-03	3.00E+00	1.11E-01	3.70E-01	1.37E-02	2.80E+00	1.04E-01	15 (0.55)
Gross Beta	3.00E+00	1.11E-01	3.10E+00	1.15E-01	3.30E+00	1.22E-01	3.30E+00	1.22E-01	15 (0.55)
Ag-108m	-7.8E-01	-2.89E-02	3.00E+00	1.11E-01	-5.80E-01	-2.15E-02	3.60E+00	1.33E-01	NS
Ag-110m	-5.00E-01	-1.85E-02	4.40E+00	1.63E-01	-2.00E-01	-7.40E-03	5.40E+00	2.00E-01	NS
Ba-140	1.60E+00	5.92E-02	1.00E+01	3.70E-01	2.80E+00	1.04E-01	7.50E+00	2.77E-01	NS
Be-7	-1.70E+00	-6.29E-02	3.00E+01	1.11E+00	3.00E+00	1.11E-01	3.80E+01	1.41E+00	NS
Ce-141	-1.60E+00	-5.92E-02	6.10E+00	2.26E-01	-3.10E+00	-1.15E-01	8.40E+00	3.11E-01	NS
Ce-144	-2.00E-01	-7.40E-03	2.00E+01	7.40E-01	2.20E+00	8.14E-02	2.60E+01	9.62E-01	NS
Co-57	-8.20E-01	-3.03E-02	2.60E+00	9.62E-02	-2.00E-01	-7.40E-03	3.40E+00	1.26E-01	NS
Co-58	-2.70E-01	-9.99E-03	3.60E+00	1.33E-01	-7.00E-01	-2.59E-02	4.00E+00	1.48E-01	NS
Co-60	-7.00E-01	-2.59E-02	5.00E+00	1.85E-01	-9.00E-01	-3.33E-02	4.50E+00	1.66E-01	NS
Cr-51	-3.20E+00	-1.18E-01	3.20E+01	1.18E+00	5.00E+00	1.85E-01	4.40E+01	1.63E+00	NS
Cs-134	1.02E+00	3.77E-02	3.10E+00	1.15E-01	1.77E+00	6.55E-02	3.40E+00	1.26E-01	NS
Cs-137	-7.00E-01	-2.59E-02	4.30E+00	1.59E-01	1.00E-01	3.70E-03	4.20E+00	1.55E-01	NS
Fe-59	2.00E-01	7.40E-03	9.60E+00	3.55E-01	-8.00E-01	-2.96E-02	9.70E+00	3.59E-01	NS
I-131	-4.60E+00	-1.70E-01	1.10E+01	4.07E-01	-3.90E+00	-1.44E-01	1.40E+01	5.18E-01	NS
K-40	-6.00E+00	-2.22E-01	5.20E+01	1.92E+00	1.20E+01	4.44E-01	5.40E+01	2.00E+00	NS
La-140	1.60E+00	5.92E-02	1.00E+01	3.70E-01	2.80E+00	1.04E-01	7.50E+00	2.77E-01	NS
Mn-54	-1.20E+00	-4.44E-02	4.00E+00	1.48E-01	1.00E+00	3.70E-02	4.00E+00	1.48E-01	NS
Nb-95	-1.50E+00	-5.55E-02	4.60E+00	1.70E-01	-2.00E-01	-7.40E-03	5.90E+00	2.18E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-1				GW-4				
Sample Name	GW-01-01	GW-01-01	MDC	MDC	GW-04-01	GW-04-01	MDC	MDC	EPA MCL[1]
Sample Date	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	4/07/09	pCi/L (Bq/L)
Analyte	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	(pCi/L)	(Bq/L)	
Ru-103	-8.00E-01	-2.96E-02	4.30E+00	1.59E-01	-1.80E+00	-6.66E-02	5.60E+00	2.07E-01	NS
Ru-106	7.40E+00	2.74E-01	2.90E+01	1.07E+00	1.20E+01	4.44E-01	3.60E+01	1.33E+00	NS
Sb-124	8.00E-01	2.96E-02	1.10E+01	4.07E-01	-1.90E+00	-7.03E-02	1.20E+01	4.44E-01	NS
Sb-125	-2.60E+00	-9.62E-02	8.90E+00	3.29E-01	-2.80E+00	-1.04E-01	1.10E+01	4.07E-01	NS
Se-75	3.00E-01	1.11E-02	3.60E+00	1.33E-01	-3.00E-01	-1.11E-02	5.50E+00	2.03E-01	NS
Zn-65	-1.60E+00	-5.92E-02	7.50E+00	2.77E-01	-2.10E+00	-7.77E-02	9.60E+00	3.55E-01	NS
Zr-95	3.60E+00	1.33E-01	5.70E+00	2.11E-01	-6.00E-01	-2.22E-02	8.00E+00	2.96E-01	NS
H-3	1.40E+02	5.18E+00	4.30E+02	1.59E+01	2.00E+01	7.40E-01	4.30E+02	1.59E+01	NS
Ra-224	2.20E-01	8.14E-03	1.30E+00	4.81E-02	2.70E+01	9.99E-01	3.60E+01	1.33E+00	NS
Ra-226	**5.30E-01**	**1.96E-02**	2.20E-01	8.14E-03	**2.47E-01**	**9.14E-03**	1.80E-01	6.66E-03	5 (0.18) [Ra-226+Ra-228] [2]
Ra-228	-1.00E+00	-3.70E-02	4.10E+00	1.52E-01	6.00E-01	2.22E-02	3.80E+00	1.41E-01	5 (0.18) [Ra-226+Ra-228] [2]
Th-228	**2.33E-01**	**8.62E-03**	1.90E-01	7.03E-03	1.20E-01	4.44E-03	1.80E-01	6.66E-03	NS
Th-230	1.81E-01	6.70E-03	2.60E-01	9.62E-03	-2.80E-02	-1.04E-03	3.00E-01	1.11E-02	NS
Th-232	1.70E-03	6.29E-05	4.50E-02	1.66E-03	6.40E-02	2.37E-03	8.80E-02	3.26E-03	NS
U-234	**2.13E+00**	**7.88E-02**	1.40E-01	5.18E-03	**7.60E-01**	**2.81E-02**	9.00E-02	3.33E-03	20 (0.74)
U-235	7.90E-02	2.92E-03	1.10E-01	4.07E-03	**1.45E-01**	**5.36E-03**	1.20E-01	4.44E-03	20 (0.74)
U-238	**5.40E-01**	**2.00E-02**	1.10E-01	4.07E-03	**5.80E-01**	**2.15E-02**	1.10E-01	4.07E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	4/06/2009	4/06/2009	4/06/2009	4/06/2009	
Radioactive Constituent					
Gross Alpha	-7.30E-01	-2.70E-02	2.60E+00	9.62E-02	15 (0.55)
Gross Beta	3.00E+00	1.11E-01	3.10E+00	1.15E-01	15 (0.55)
Ag-108m	2.40E-01	8.88E-03	3.40E+00	1.26E-01	NS
Ag-110m	1.70E+00	6.29E-02	5.40E+00	2.00E-01	NS
Ba-140	-3.80E+00	-1.41E-01	1.50E+01	5.55E-01	NS
Be-7	1.40E+01	5.18E-01	3.30E+01	1.22E+00	NS
Ce-141	-2.80E+00	-1.04E-01	7.90E+00	2.92E-01	NS
Ce-144	1.32E+01	4.88E-01	2.50E+01	9.25E-01	NS
Co-57	-2.50E-01	-9.25E-03	3.20E+00	1.18E-01	NS
Co-58	-4.00E-01	-1.48E-02	5.20E+00	1.92E-01	NS
Co-60	1.10E+00	4.07E-02	5.60E+00	2.07E-01	NS
Cr-51	-9.00E+00	-3.33E-01	4.10E+01	1.52E+00	NS
Cs-134	-1.09E+00	-4.03E-02	4.30E+00	1.59E-01	NS
Cs-137	-3.00E-01	-1.11E-02	4.80E+00	1.78E-01	NS
Fe-59	2.90E+00	1.07E-01	1.00E+01	3.70E-01	NS
I-131	2.50E+00	9.25E-02	1.40E+01	5.18E-01	NS
K-40	4.20E+01	1.55E+00	7.30E+01	2.70E+00	NS
La-140	-3.80E+00	-1.41E-01	1.50E+01	5.55E-01	NS
Mn-54	-2.10E+00	-7.77E-02	5.30E+00	1.96E-01	NS
Nb-95	-1.70E+00	-6.29E-02	5.90E+00	2.18E-01	NS
Ru-103	-3.50E+00	-1.29E-01	6.00E+00	2.22E-01	NS

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

Well Name	GW-2				
Sample Name Analyte	GW-02-01 (pCi/L)	GW-02-01 (Bq/L)	MDC (pCi/L)	MDC (Bq/L)	EPA MCL[1] pCi/L (Bq/L)
Sample Date	4/06/2009	4/06/2009	4/06/2009	4/06/2009	
Ru-106	1.90E+01	7.03E-01	3.30E+01	1.22E+00	NS
Sb-124	-2.30E+00	-8.51E-02	1.40E+01	5.18E-01	NS
Sb-125	2.60E+00	9.62E-02	1.00E+01	3.70E-01	NS
Se-75	4.00E-01	1.48E-02	5.00E+00	1.85E-01	NS
Zn-65	0.00E+00	0.00E+00	1.10E+01	4.07E-01	NS
Zr-95	2.10E+00	7.77E-02	6.80E+00	2.52E-01	NS
H-3	9.00E+01	3.33E+00	4.30E+02	1.59E+01	NS
Ra-224	**5.70E+01**	**2.11E+00**	5.10E+01	1.89E+00	NS
Ra-226	2.40E-01	8.88E-03	2.50E-01	9.25E-03	5 (0.18) [Ra-226+Ra-228][2]
Ra-228	1.90E+00	7.03E-02	4.40E+00	1.63E-01	5 (0.18) [Ra-226+Ra-228][2]
Th-228	3.40E-01	1.26E-02	5.20E-01	1.92E-02	NS
Th-230	4.70E-02	1.74E-03	3.50E-01	1.29E-02	NS
Th-232	7.10E-02	2.63E-03	1.50E-01	5.55E-03	NS
U-234	**9.30E-01**	**3.44E-02**	1.10E-01	4.07E-03	20 (0.74)
U-235	2.90E-02	1.07E-03	1.20E-01	4.44E-03	20 (0.74)
U-238	**5.50E-01**	**2.03E-02**	1.20E-01	4.44E-03	20 (0.74)

Table 3.4-14 Radiochemical Analyses for the EREF Site Groundwater

NOTES:

Highlighted results above minimum detectable concentration (MDC)

1. EPA, 2002.
2. Radium MCL is to be compared against the summed concentrations of Ra-226 and Ra-228.
3. Combined Ra-226 and Ra-228 MDC is greater than combined EPA MCL due to sample size limitations.
4. Radium-228 concentration derived indirectly from a daughter product, Ac-228

NM = Not measured
NS = No standard
NA = No analysis
MCL = Maximum Contaminant Level
MDC = Minimum Detectable Concentration
1 Bq = 27.03 pCi
See ER section 3.4.15.4, Site Groundwater Quality, for explanation of negative radiological values

3.5 ECOLOGICAL RESOURCES

This section describes the terrestrial communities of the proposed Eagle Rock Enrichment Facility (EREF) and provides a baseline characterization of the proposed site's ecology prior to any disturbances associated with construction or operation of the proposed plant. Prior environmental disturbances (e.g., roads) not associated with the proposed plant are considered when describing the baseline condition.

The proposed site is within the Intermountain Semi-Desert Province (Bailey, 1995). The primary natural community is sagebrush steppe. The plant and animal species associated with this major community are identified and their distributions are discussed. Those species that are considered important to the ecology of the proposed site are described in detail. Once the important species are identified, their interrelationship with the environment is described. These descriptions include discussions of the species' habitat requirements, life history, and population dynamics. As part of the evaluation of important species at the proposed site, pre-existing environmental conditions that may have impacted the ecological integrity of the proposed site are considered. Unless otherwise indicated, the information provided in this section is based on surveys conducted by AREVA.

May 2008, June 2008, October 2008, January 2009, and April 2009

for the June 2008 and October 2008 surveys

3.5.1 Maps

Ecological field surveys at the proposed site were conducted in ~~May, June, and October 2008~~. Wildlife and vegetation transects were used to obtain information on vegetation cover, mammals, birds, reptiles, and amphibians occurring on the site. The locations of the transects and data collection points are shown in Figure 3.5-1, Vegetation and Animal Survey Transect Locations and Habitat Map.

Insert 3.5.1 (attached)

June and October 2008

3.5.2 General Ecological Conditions of the Site

Bonneville County is located in the eastern portion of the Snake River Plain geologic province. The Snake River Plain is a crescent shaped area of topographic depression that is bounded on three sides by mountain ranges and extends across much of the southern portion of Idaho, covering about 40,400 km^2 (15,600 mi^2). The geology of the Snake River Plain has experienced extensive volcanism that has deposited a thick sequence of rhyolitic and basaltic rocks, ranging up to 1,676 m (5,500 ft) thick. On-site soils are primarily of the Pancheri series. These soils consist of deep silt loams. On-site soils are common to areas used for crops, rangeland, and wildlife habitat. Refer to Section 3.3, Geology and Soils, for further discussion on the Snake River Plain.

The topography of the 1,700-ha (4,200-acre) proposed site has an average slope of about 1.4%. The elevation varies from about 1,556 m (5,106 ft) near U.S. Highway 20 to about 1,600 m (5,250 ft) in a small area at the eastern edge of the property. No major defined drainage features are evident on the proposed site. There is a minor drainage feature that runs from near the center of the proposed site toward the southwest portion of the site.

Soils in the Eastern Snake River Plain are variable, ranging from non-existent in areas of recent volcanism to tens of meters in thickness in areas of wind-blown loess derived from exposed lava flows, lacustrine deposits, and alluvial fill (Hughes, 1999) (Lindholm, 1996) (Whitehead, 1994a). The proposed site is located in an area dominated by Pancheri silt loams formed in loess covered lava plains (NRCS, 2008c). Pancheri silt loams are typically deep, well-drained soils although soil depths often vary depending upon the prevalence of basalt flows near the surface.

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Insert 3.5.1:

The locations of the transects and data collection points for the January 2009 surveys are shown in Figure 3.5-2, January 2009 Animal Survey Transect Locations and Habitat Map. The locations of the transects and data collection points for the April 2009 surveys are shown in Figure 3.5-3, April 2009 Animal Survey Transect Locations and Habitat Map.

Soil depth on the proposed site ranges from 30 cm to 6.6 m (6 in to 21.5 ft). The vegetation in this area is dominated by Wyoming big sagebrush (*Artemisia tridentata wyomingensis*).

The sagebrush steppe vegetation community at the proposed site has been influenced by agricultural practices and grazing. The entire proposed site is grazed seasonally; and there is active irrigated farming on about 389 ha (962 acres), as well as approximately 882 ha (2,180 acres) that was dryland farmed as recently as four to five years ago. The sagebrush on portions of the proposed site has been cleared and the land seeded with perennial grasses to utilize as improved pasture for grazing. Existing vegetation on these areas is dominated by crested wheatgrass (*Agropyron cristatum*) and weedy annuals with limited sagebrush presence associated with basalt outcrops.

The composition of the wildlife community at the proposed site is dependent on habitat characteristics in and around the site. Based on initial field surveys of wildlife and with information on regional and local distribution of wildlife species and on species-specific habitat preferences, the wildlife species likely to occur at the proposed site can be identified. The mammals, birds, amphibians and reptiles known or expected to occur on the proposed site are discussed below.

Mammals typical of species that may occur in sagebrush habitats include: black-tailed jackrabbit (*Lepus californicus*), mountain cottontail (*Sylvilagus nuttallii*), pygmy rabbit (*Brachylagus idahoensis*), Townsend's ground squirrel (*Spermophilus townsendii*), least chipmunk (*Eutamias minimus*), Ord's kangaroo rat (*Dipodomys ordii*), great basin pocket mouse (*Perognathus parvus*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse *Peromyscus maniculatus*), badger (*Taxidea taxus*), coyote (*Canis latrans*), pronghorn (*Antilocapra americana*), and elk (*Cervus elaphus*) (Stoller, 2001). Refer to Table 3.5-1, Mammals Potentially Using the Proposed Eagle Rock Enrichment Facility Site, for a more complete list of mammals potentially using the proposed site. Table 3.5-1 also lists the general habitat requirements of each mammal species potentially occurring at the proposed site and its probable occurrence. The probable occurrence estimates are derived from knowledge of the species-specific habitat preferences and the current composition, structure, and extent of the vegetation communities at the proposed site. Vegetation in the sagebrush community is in an advanced seral stage. Therefore, changes are not anticipated in habitat or animal species. Similarly, the farmed areas are not expected to change. Vegetation on the 882 ha (2,180 acres) that has been dryland farmed is in a low seral stage with a substantial weed component. Seasonal grazing and limited rainfall will limit vegetation change in this area; therefore, changes in habitat or animal use will also be limited. May 2008, June 2008, October 2008, January 2009, and April 2009

Field surveys to identify mammals at the proposed site were conducted in ~~May, June, and October 20~~08. Incidental observations were made during reconnaissance surveys in May 2008 and wildlife transects were walked in ~~June and October 2008~~. Small mammal capture and release was not conducted during the field survey. June 2008, October 2008, January 2009, and April 2009

Common game birds in the region include the mourning dove (*Zenaida macroura*) and greater sage grouse (*Centrocercus urophasianus*). Other birds common to the region include western meadowlark (*Sturnella neglecta)*, horned lark (*Eremophila alpestris*), kildeer (*Charadrius vociferous*), and the sage thrasher (*Oreoscoptes montanus*). Raptors include northern harrier (*Circus cyaneus*) and American kestrel (*Falco sparverius*) (Stoller, 2001). Table 3.5-2, Birds Potentially Using the Proposed Eagle Rock Enrichment Facility Site, lists the bird species that may occur on the proposed site along with their migratory and nesting status. All waterfowl and water birds have been excluded from this list due to the lack of suitable water-related habitat on the proposed site. The 62 species listed were identified as those likely to live in or visit the region. Of these, approximately 13 species are likely to be summer breeder residents, many of

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June 2008, October 2008, January 2009, and April 2009

which may nest on the proposed site. These species are denoted with the letter "C" under the column "Summer Breeder" in Table 3.5-2. Approximately two of the species are probable winter residents of the proposed site. A site-specific avian survey was conducted on the proposed site in ~~June 2008~~ using wildlife transects and point count techniques.

Reptile species that may be present on the proposed site include the western rattlesnake (*Crotalus viridis*), gopher snake (*Pituophis catenifer*), short-horned lizard (*Phrynosoma douglassi*), and sagebrush lizard (*Sceloporus graciosus*) (Stoller, 2001). Amphibians and reptiles (herptiles) potentially occurring on the proposed site are listed in Table 3.5-3, Amphibians/Reptiles Potentially Using the Proposed Eagle Rock Enrichment Facility Site. Table 3.5-3 also lists the general habitat requirements for each amphibian or reptile species potentially occurring at the proposed site as well its probable occurrence. Because the occurrence of amphibian species is closely related to water and the proposed site contains no permanent water, there are very few associated amphibian species.

3.5.3 Description of Important Wildlife and Plant Species

Based on information from the Idaho Department of Fish and Game (IDFG), the U.S. Fish and Wildlife Service (USFWS), and the Bureau of Land Management - Upper Snake Field Office (BLM), the proposed site is located within the known range of four sensitive species: greater sage grouse (*Centrocercus urophasianus*) (IDFG, 2005), ferruginous hawk (*Buteo regalis*) (IDFG, 2005), pygmy rabbit (*Brachylagus idahoensis*) (IDFG, 2005), and Ute ladies'-tresses (*Spiranthes diluvialis*) (IDFG, 2005). The greater sage grouse is listed as a BLM sensitive species (Type 2 Rangewide/Globally Imperiled Species) (IDFG, 2005). The USFWS began a 12-month review in February 2008 to determine if listing of the greater sage grouse is appropriate (USFWS, 2008e) (USFWS, 2008f). However, IDFG maintained a hunting season for the species in 2007 and 2008. The nearest known breeding area or "lek" is located between 6.4 km and 8 km (4 mi and 5 mi) from the proposed site to the northwest. Field surveys of the proposed site in ~~April~~ 2008 did not locate any leks. Greater sage grouse use the sagebrush habitat on the proposed site and have been observed in large flocks moving west in the late fall. They likely use the proposed site throughout the year. The pygmy rabbit has been listed by the BLM as a species of concern and the USFWS initiated a status review in January 2008 to determine if the species should be listed as threatened or endangered. Field surveys of the proposed site in ~~June and October 2008~~ did not record the presence of any pygmy rabbits or signs of their presence. In Idaho, pygmy rabbits are listed as a species of concern.

May

The sensitive species that may be present on the proposed site are discussed below in detail based on their special status and potential proximity to the proposed site. Other species are selected for discussion based on their importance for recreation or commercial value. The remaining species listed in Tables 3.5-1 through 3.5-3 are considered less important in terms of protected status, recreation, or commercial value. A complete list of sensitive species that potentially occur in the area surrounding the proposed site is presented in Table 3.5-4, Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site.

GREATER SAGE GROUSE

June 2008, October 2008, January 2009, and April 2009

Habitat Requirements. Greater sage grouse are closely allied with large, woody sagebrushes of western North America and depend on these for food and cover during all periods of the year. Due to greater sage grouse dependence on sagebrush habitats, they are considered a sagebrush obligate. Large, woody species of sagebrush, including big sagebrush (*Artemisia tridentata)*, silver sagebrush (*Artemisia cana*), and threetip sagebrush (*Artemisia tripartita*) are used by greater sage grouse throughout the year in all seasonal habitats. Other shrub species

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Wyoming big sagebrush is the preferred browse for wild ungulates, and Wyoming big sagebrush communities are important winter ranges for big game (Howard, 1995). Pronghorn usually browse Wyoming big sagebrush heavily (Howard, 1999). Sagebrush also provides cover (nesting, resting, and escape) for a wide variety of game and non-game species.

Habitat. Of the three subspecies, Wyoming big sagebrush is most adapted to poor, infertile sites. Wyoming big sagebrush is intolerant of alkaline soils. In Idaho, it typically grows on dry, gravelly, shallow sites ranging from 700-1,980 m (2,500 to 6,500 ft) (Howard, 1999). Wyoming big sagebrush is most common on foothills, undulating terraces, slopes, and plateaus, but also occurs in basins and valley bottoms. Aspect varies, but shrubs are most common on south- to west-facing slopes.

Life History. Wyoming big sagebrush reproduces from seed; it does not sprout or layer (Howard, 1999). Twig elongation for Wyoming big sagebrush begins in mid-April and lasts until late June. Flowers of this species appear in late August, but flower bud development can last from mid-June until early September (Whitson, 2006). Wyoming big sagebrush forms and sheds seeds between October and December (Whitson, 2006). Seeds remain viable in the soil for one year (Whitson, 2006). Seeds may be transported by wind, water, or animals, but most seeds typically remain near parent plants.

3.5.4 Rare, Threatened or Endangered Species Known or Potentially Occuring in the Project Area

June 2008, October 2008, January 2009, and April 2009

Based on field surveys and contacts with state and federal agency personnel, no currently listed rare, threatened, or endangered species have been found or are known to occur on the proposed site. However, USFWS initiated a status review in January 2008 for the pygmy rabbit (USFWS, 2008d) and in February 2008 for the greater sage grouse (USFWS, 2008e) (USFWS, 2008f) to determine if listing of either species is warranted. Life history and habitat requirements for both species are discussed in Section 3.5.3, Description of Important Wildlife and Plant Species.

Habitat is present on the proposed site for pygmy rabbits but is isolated to the western portion of the proposed site. However, no sign (e.g., pellets, burrows) of pygmy rabbits were observed during field surveys of the proposed site in ~~June and October 2008~~. Pygmy rabbits have been found during surveys conducted by BLM in 2005 and 2006 on BLM lands (Crooked Creek and Medicine Creek) north of Market and Mudd lakes. No surveys have been conducted on BLM lands near the proposed site. Similarly, pygmy rabbits have also been found on the INL property during winter surveys conducted by DOE in 2006 and 2007. These surveys were conducted on the INL property at two locations within 3.2 km (2 mi) of the proposed site and at seven other locations within 8 km (5 mi) of the proposed site.

Habitat is present on the proposed site for greater sage grouse. Habitat is primarily isolated to the western portion of the proposed site. No birds were observed or heard during June 2-7, 2008 field surveys on the proposed site. However, greater sage grouse sign (e.g., feathers, and pellets) were observed during the June field surveys. One bird was observed about 1.6 km (1 mi) north of the proposed site and two birds were heard some distance from the proposed site during road point counts in May 2008. There are several leks within 16 km (10 mi) of the proposed site.

Insert 3.5.4 (attached)

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Insert 3.5.4:

No sign or sightings of greater sage grouse were observed during the October 2008 field surveys.

During the January 2009 field surveys, several sets of sage grouse tracks were found in a small portion of the sagebrush community in the northwest portion of the site, in a location where sage grouse activity was previously documented during summer surveys. In addition, a single set of sage grouse tracks was found in the irrigated crop portion of the site, far from any standing vegetation.

During the April 2009 field surveys, three areas containing grouse feathers were found along the northern border of the property with adjacent BLM land to the immediate north. One of these feather sets contained wing primaries, perhaps indicative of a raptor kill. No scat could be found in the vicinity of the feathers, and no other indications of sage grouse was found on the site during this spring survey.

densities of these small relict sagebrush stands with those of the adjacent sagebrush community. Average shrub density on the outcrops found in the seeded crested wheatgrass community, including both size classes, is approximately 1,310 shrubs/ha (526 shrubs/ac). Densities of Wyoming big sagebrush are approximately 2,100 shrubs/ha (850 shrubs/ac) for the ≥40-cm size class, and 1,800 shrubs/ha (728 shrubs/ac) for the <40-cm size class. Densities of dwarf goldenbush are approximately 100 shrubs/ha (40 shrubs/ac) for the ≥40-cm size, and 2,100 shrubs/ha (850 shrubs/ac) for the ≥40-cm size class. Densities of rubber rabbitbrush are approximately 500 shrubs/ha (243 shrubs/ac) for the ≥40-cm size class, and 1,100 shrubs/ha (445 shrubs/ac) for the <40-cm size class.

3.5.6 Wildlife Occurrence and Site Use

The importance of the habitat found on the proposed site for threatened, endangered, and other important species relative to the habitat of those species throughout their entire range is rather low. Most of these species have limited habitat on the proposed site, the habitats have been extensively grazed or converted to agriculture and habitats present on the proposed site are not rare or uncommon in the general area.

A field survey conducted in June 2008 revealed that the sagebrush community supports a diversity of bird and mammal species (Table 3.5-8a, Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site-Rangeland Area). During field reconnaissance in May 2008, several mobile mammal species were observed including a small herd of pronghorn, individual white-tailed deer, and numerous black-tailed jackrabbits. Pronghorn and black-tailed jackrabbits were observed incidentally during field surveys in June 2008. The most common species encountered in the sagebrush community during avian transect surveys in June 2008 included the horned lark (49.1% of the total number of birds observed), Brewer's sparrow (*Spizella breweri*) (15.4% of the total number of birds observed), and western meadowlark (13.6% of the total number of birds observed). Other birds commonly encountered included the sage thrasher, vesper sparrow (*Pooecetes gramineus*), mourning dove (*Zenaida macroura*), and northern harrier. A total of 17 bird species were positively identified in the sagebrush community in June 2008. The only commonly observed bird species encountered in the sagebrush community during the October 2008 surveys was the horned lark (79.9% of the total number of birds observed). A total of 7 bird species were positively identified in this community during the fall survey. ← Insert 3.5.6-1 (attached)

The most common species encountered in the non-irrigated seeded pasture community during the June 2008 avian transect surveys include the horned lark (68.2% of the total number of birds observed), Brewer's sparrow (12.9% of the total number of birds observed), and western meadowlark (9.4% of the total number of birds observed) (Table 3.5-8b, Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site-Non-Irrigated Seeded Pasture Area). The only other bird species commonly encountered was the vesper sparrow. A total of 9 bird species were positively identified in the non-irrigated seeded pasture community in June 2008. The only commonly observed bird species encountered in the non-irrigated seeded pasture community during the October 2008 surveys was the horned lark (74.4% of the total number of birds observed). A total of 5 bird species were positively identified in this community during the fall survey. ← Insert 3.5.6-2 (attached)

The most common species encountered in the agriculture (center-pivot) community during June 2008 avian point-count surveys include the horned lark (54.8% of the total number of birds observed), meadowlark (12.9% of the total number of birds observed), northern harrier (12.9% of the total number of birds observed), and long-billed curlew (*Numenius americanus*) (12.9% of the total number of birds observed) (Table 3.5-8c, Avian Transect Survey Data Summary for the 1a

Insert 3.5.6-1:

A total of 5 bird species (or their sign) were positively identified in the sagebrush community during the January 2009 survey. These species include the northern harrier, red-tailed hawk, horned lark, American crow, and Greater sage-grouse. During the January 2009 surveys, several sets of sage grouse tracks were found in a small portion of the sagebrush community in the northwest portion of the site, in a location where sage grouse activity was previously documented during summer surveys. A total of 10 bird species were positively identified in the sagebrush community during the April 2009 survey. The most common bird species encountered in the sagebrush community during the April 2009 surveys were the horned lark and western meadowlark. Other bird species encountered include the Brewer's sparrow, sage sparrow, and sage thrasher. Raptors encountered during this survey include the red-tailed hawk and prairie falcon. Greater sage grouse feathers were found in three discrete locations along the northern edge of the property in the sagebrush habitat. No scat was found, however, and no birds were either seen or heard during the survey period.

Insert 3.5.6-2:

During the January 2009 surveys, cattle were concentrated on the non-irrigated seeded pasture portion of the site and were fed via tractor on most mornings. As such, this area was avoided during winter surveys, as wildlife occurrence would be reduced by the livestock occupation and associated feeding activities. A total of 5 bird species were positively identified in the seeded crested wheatgrass vegetation type during the April 2009 surveys. The most common bird species encountered was the horned lark. Western meadowlarks, Brewer's sparrows, an American crow, and a black-billed magpie were also observed.

black-tailed

Proposed Eagle Rock Enrichment Facility Site-Crop Area). The only other bird species encountered was the mourning dove. A total of 5 bird species were positively identified in the non-irrigated seeded pasture community in the June 2008 survey. The only commonly observed bird species encountered in the agriculture community during the October 2008 surveys was the horned lark (82% of the total number of birds observed). A total of 5 bird species were positively identified in this community during the fall survey.

Insert 3.5.6-3 (attached)

Mammalian species encountered via direct observation, sign, or vocalization on the site included coyote, pronghorn, badger, jackrabbit, ~~and~~ white-tailed deer (*Odocoileus virginianus*).

3.5.7 Location of Important Travel Corridors

May 2008, June 2008, October 2008, January 2009, and April 2009

The proposed site is within BLM-designated crucial winter-spring range of pronghorn. Pronghorn use the area through the spring and then move to summer range. Elk, white-tailed deer, and mule deer are known to be incidental visitors to the area. Elk have been observed by the current landowner in late fall and winter. Two deer were observed just north of the proposed site in May 2008.

Field surveys conducted on the site in ~~May and June 2008~~ identified a limited number of migratory bird species present on the proposed site. The closest migratory bird route is located on the INL property approximately 24-32 km (15-20 mi) west of the site (Stoller, 2007). Studies conducted on the INL property indicate that migratory bird populations have increased along the Tractor Flats Route along the eastern portion of the sagebrush steppe. Although migratory birds utilize the property on a limited basis, the site has not been identified as an important travel corridor for migratory bird species.

May 2008, June 2008, January 2009, and April 2009

The proposed site also provides limited habitat for the greater sage grouse. Field surveys for the greater sage grouse that were conducted in ~~May and June 2008~~ indicated that the species may use the northwestern portion of the proposed site for roosting. No greater sage grouse were identified on the property during the field surveys; and, although the site has sagebrush densities that meet the requirements for greater sage grouse habitat, the site has not been identified as an important travel corridor for this species.

, Least chipmunk (Tamias minimus), Townsend's ground squirrel (Spermophilus townsendii) and deer mouse (Peromyscus maniculatus).

3.5.8 Important Ecological Systems

The proposed site contains fair to poor quality wildlife habitat. The sagebrush steppe vegetation community is an important ecological system in the region. On the proposed site and throughout the region, this community has been impacted by past land use practices. While it is susceptible to change, it is not especially vulnerable compared to other ecosystem types. General threats include conversion to other land uses and wildfire (ISGAC, 2006).

As discussed in Section 3.5.4, about one-third of the proposed EREF site is sagebrush steppe vegetation, while the remaining area is in crop land and seeded crested wheatgrass.

The proposed EREF site does not contain any breeding, nursery, feeding, or resting areas for any sensitive, rare, or protected species. The proposed site is within a general area considered crucial winter-spring pronghorn habitat by the BLM. While pronghorn use the site, pronghorn ~~have not been observed and~~ are not known to concentrate on the limited sagebrush steppe vegetation found on the proposed site.

Field observations indicate that greater sage grouse do use the sagebrush community on the proposed site as roosting habitat, but no leks were found on the site or known to exist on the site. The nearest known greater sage grouse lek is between 6.4 and 8 km (4 and 5 mi) to the

May 2008, June 2008, October 2008, January 2009, and April 2009

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Insert 3.5.6-3:

A total of 3 bird species (or their sign) were positively identified in the irrigated crop vegetation type during the January 2009 surveys. These species include the horned lark, American crow, and Greater sage-grouse. During the January 2009 surveys, a single set of sage grouse tracks was found in the irrigated crop portion of the site, far from any standing vegetation. A total of 5 bird species were positively identified in the irrigated crop vegetation type during the April 2009 surveys. Species observed included the horned lark, western meadowlark, Brewer's sparrow, sage sparrow, and American crow.

3.5.14 Description of Ecological Succession

Long-term ecological studies on the proposed site are not available for analysis of ecological succession at this specific location. The proposed site is located in a sagebrush steppe vegetation community, which is a late-seral community that has been established in southeastern Idaho for an extended period. A large portion of the proposed site has been altered from a sagebrush community for purposes of agriculture. Portions of the site are grazed by cattle.

The sagebrush steppe landscape is a mosaic of shrub-dominated and herbaceous-dominated communities. Big sagebrush communities are critical habitat for greater sage grouse and other sagebrush obligate species. Historically, fire was the principal disturbance within this vegetation type; other disturbances included insects, periods of drought and wet cycles, and shifts in climate (return interval of 100 years). Intervals between natural wildfires varied between 25 years and 100+ years (West, 2000).

Wyoming big sagebrush is a mid- to late-seral species (Howard, 1999). Disturbed sagebrush communities are mostly populated with associated grasses. Wyoming big sagebrush may lose dominance in areas that have not experienced fire or other stand-replacing events for half a century or more (Howard, 1999).

3.5.15 Description of Ecological Studies

A vegetation survey of the proposed site was conducted in early June 2008. Plant cover by species on the proposed site was obtained through a series of 100-m (328-ft) transects. Twenty-one transects were located on a map of the property before the survey was conducted in the sagebrush community, and 11 transects were located in the non-irrigated seeded pasture community. The transects were then positioned on the ground (See Figure 3.5-1, Vegetation and Animal Survey Transect Locations and Habitat Map).

Sampling locations were determined by placing a grid over the site showing the communities to be sampled. Two 50-m (164-ft) tapes, one oriented south from the sampling point, the other oriented east from the sampling point, were then placed in the field. Point-intercept measurements were recorded at each 0.5-m (1.64-ft) interval of each transect, for a total of 100 samples points. The sampler traversed each transect, and at each 0.5-m (1.64-ft) interval, recorded the plant species found directly below the point on the transect. The sampler considered only those plants or seedlings touched by the line or lying under it. If a plant was not encountered at a sample point, either litter, bare ground, or rock was recorded.

This point-intercept survey method provides objective and accurate results. Sampling error is reduced since the survey results are based on actual measurements of the plants growing in randomly located and clearly defined sampling units. The survey method results are accurate in mixed plant communities and suited for measuring low vegetation. By direct measurement of small samples, the method allows estimates of known reliability to be obtained concerning the vegetation, its composition, and ecological structure.

Several sampling methods were used to identify animals using the proposed site. Incidental animal sitings were noted during field reconnaissance visits in May 2008. Wildlife transects and avian point survey techniques were used during ~~June 2008~~ surveys. Linear transects parallel and immediately adjacent to the vegetation transects in the sagebrush community were walked in the mornings from about 30 minutes before sunrise to two hours after sunrise. Avian point surveys were also conducted during the mornings in the agricultural areas. Trapping or capture and release sampling was not conducted during the ~~June 2008~~ survey

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June 2008, October 2008, January 2009, and April 2009

Sage-grouse habitat restoration symposium proceedings; 2001 June 4-7, Boise, ID. Proc. RMRS-P-38. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station (Shaw, 2005).

- This series of 14 papers summarizes current knowledge and research gaps in sagebrush taxonomy and ecology, seasonal greater sage grouse habitat requirements, approaches to community and landscape restoration, and currently available plant materials and revegetation technology to provide a basis for designing and implementing effective management prescriptions.

3.5.16 Information on Rare, Threatened, and Endangered Sightings

A number of rare, threatened, or endangered species could potentially occur on the proposed site based on a literature review (Table 3.5-4). However, habitat types on the proposed site limit the number of these species that may occur. Based on field surveys, a review of habitat requirements, and contacts with state and federal agency personnel, only three sensitive species would likely use the proposed site. These species are the greater sage grouse, pygmy rabbit, and Townsend's big-eared bat (*Corynorhinus townsendii*). The USFWS initiated a status review in January 2008 for the pygmy rabbit (USFWS, 2008d) and in February 2008 for the greater sage grouse (USFWS, 2008e) (USFWS, 2008f) to determine if listing of either species is warranted. In addition, Townsend's big-eared bat was formerly a Candidate 2 (C2) species under the Endangered Species Act and is now considered a Species of Concern (non-statutory ranking) by the USFWS (Gruver, 2006).

Information from spring surveys conducted between March and May, 2008 by state and federal agencies indicates that the closest population of greater sage grouse has been sighted in an area approximately 8 km (5 mi) northwest of the proposed site. A field survey for the greater sage grouse that was conducted in May 2008 indicated that the species was not found on the proposed site. However, signs that greater sage grouse had roosting sites on the site were found, although no leks were located on the site. Insert 3.5.16-1 (attached)

Pygmy rabbit populations have been well documented by the INL (Wilde, 1978) and several dens have been identified throughout the INL property. Pygmy rabbits have also been documented by the Snake River BLM staff to the north at Mudd Lake. Wildlife surveys conducted in June and October of 2008 did not identify any pygmy rabbits on the proposed site, although other species of rabbits were observed. The closest known population of the pygmy rabbit is on the eastern area of the INL about 8.8 km (5.5 mi) west of the proposed site.

Townsend's big-eared bat caves are located south of the proposed site in the lava flow area. Habitat at the proposed facility is comprised of sagebrush, agriculture and non-irrigated seeded pasture and does not meet habitat requirements for the Townsend's big-eared bat.

Insert 3.5.16-2 (attached)

3.5.17 Agency Consultation

Consultation was made with the USFWS and in a letter response dated June 30, 2008, the USFWS did not identify any issues that indicate that consultation under Section 7 of the Endangered Species Act of 1973, as amended, is needed for the proposed EREF. Refer to Appendix A, Consultation Documents, for a complete list of consultation documents.

3.5.18 Rare, Threatened and Endangered Effects by Other Federal Projects

There are no other federal projects within 16 km (10 mi) of the proposed EREF site.

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Insert 3.5.16-1:

No sign or sightings of greater sage grouse were observed during the October 2008 survey. During January 2009 surveys, several sets of sage grouse tracks were found in a small portion of the sagebrush community in the northwest portion of the site, in a location where sage grouse activity was previously documented during summer surveys. In addition, a single set of sage grouse tracks was found in the irrigated crop portion of the site, far from any standing vegetation. During the April 2009 survey, three areas containing grouse feathers were found along the northern border of the property with adjacent BLM land to the immediate north. One of these feather sets contained wing primaries, perhaps indicative of a raptor kill. No scat could be found in the vicinity of the feathers, and no other indication of grouse use was found on the site during this spring survey.

Insert 3.5.16-2

No indication of pygmy rabbits were found on the proposed site including tracks, pellets, burrows, or direct sightings of the animals themselves during the January 2009 and April 2009 surveys.

Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 3 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated from Detailed Analysis	Reference
Greater Sage Grouse	*Centrocercus urophasianus*	BLM Type 2; USFS R4 S	This species is entirely dependent on sagebrush–dominated habitats. Breeding habitat is characterized by sagebrush canopy coverage of 15–25% with a healthy grass and forb understory. During summer, sage grouse may use a variety of habitats but are generally found in areas with succulent forbs and insects. Winter habitat consists of relatively large areas of sagebrush with 10–25% canopy cover.	Yes. This species is widely distributed throughout sagebrush–dominated habitats of southern Idaho. Sign of species observed on-site during ~~June 2008 surveys~~. June 2008, January 2009, and April 2009 surveys. No sightings of species were observed on-site during the June 2008, October 2008, January 2009, and April 2009 surveys.	No. Suitable habitat present within the proposed site. Surveys conducted and signs of species found	IDFG, 2005; NatureServe, 2008.
Columbian Sharp-tailed Grouse	*Tympanuchus phasianellus columbianus*	BLM Type 3; USFS R4 S	Columbian sharp–tailed grouse occupy a variety of habitats generally characterized by dense stands of herbaceous cover and a mixture of shrubs.	Low likelihood In southeastern Idaho, Columbian sharp–tailed grouse are reasonably widespread in shrub and grass habitats adjacent to or in mountainous foothills. Nearest mountain are over 80 km (50 mi)	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.
Ferruginous Hawk	*Buteo regalis*	BLM Type 3	This species inhabits flat and rolling terrain in grassland or shrub steppe regions, typically avoiding high elevation, forest interior, and narrow canyons. In Idaho, becomes locally abundant at the interface between piñon–juniper and shrubsteppe environments.	Yes.	No. Suitable habitat present within the proposed site. No animals observed during surveys.	IDFG, 2005; NatureServe, 2008.

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Table 3.5-4 Sensitive Species Potentially Present in the Area of the Proposed Eagle Rock Enrichment Facility Site
(Page 5 of 8)

Common Name	Scientific Name	Status[1]	Habitat Association	Probable Occurrence at EREF Site	Eliminated *from* Detailed Analysis	Reference
Townsend's Big-eared Bat	*Corynorhinus townsendii*	BLM Type 3; USFS R4 S	Distribution and abundance is highly correlated with suitable cavity forming rock formations and historic mining districts. More than 90% of their diet consists of Lepidopterans.	Low likelihood. Only 2 maternity colonies have been confirmed in Idaho and both sites are found in the Craters of the Moon National Monument and in the BLM Hell's half Acre WSA south of the site. Numerous hibernacula in lava tube caves have been identified in south central and southeast Idaho.	No. Foraging may occur because colonies are known to exist within 8 km (5 mi) of the site.	IDFG, 2005; NatureServe, 2008.
Canada Lynx	*Lynx canadensis*	FT; BLM Type 1; USFS R4 S	In Idaho, the Canada lynx inhabits montane and subalpine coniferous forests typically above 1,200 m (4,000 ft). Habitat used during foraging is usually early successional forest. Dens are usually in mature forests. Individuals are wide-ranging and require large tracts of forest.	None.	Yes. There is no suitable habitat present for this species within the proposed site.	IDFG, 2005; NatureServe, 2008.
Pygmy Rabbit	*Brachylagus idahoensis*	BLM Type 2; USFS R4 S	This species is a sagebrush obligate. Habitat is dense, tall stands of big sagebrush growing on deep, friable soils that allow the rabbits to dig extensive burrow systems. Landscape features include alluvial fans and hillsides, swales within rolling topography, floodplains, brushy draws, riparian channels, edges of rock and lava outcroppings, and mima mounds.	Yes. Field surveys of the proposed site in June 2008, October 2008, January 2009, and April 2009 did not record the presence of any pygmy rabbits or signs of their presence on-site.	No. Suitable habitat present within the proposed site. No signs or animals observed during surveys.	IDFG, 2005; NatureServe, 2008.

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Table 3.5-8a Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Rangeland Area

(Page 1 of ~~1~~ 2)

Insert new Table 3.4-8a, page 2 of 2, after this page

Species		June 2008		October 2008	
		Total Number*	% of Total Number	Total Number*	% of Total Number
Horned Lark	*Eremophila alpestris*	137	49.1	111	79.9
Western Meadowlark	*Sturnella neglecta*	38	13.6	0	0.0
Sage Thrasher	*Oreoscoptes montanus*	18	6.5	0	0.0
Northern Harrier	*Circus cyaneus*	6	2.2	1	0.7
Brewer's Sparrow	*Spizella breweri*	43	15.4	16	11.5
Chipping Sparrow	*Spizella passerina*	0	0.0	0	0.0
Sage Sparrow	*Amphispiza belli*	3	1.1	2	1.1
Vesper Sparrow	*Pooecetes gramineus*	8	2.9	0	0.0
Grasshopper Sparrow	*Ammodramus savannarum*	5	1.8	0	0.0
Mourning Dove	*Zenaida macroura*	6	2.2	1	1.4
Kildeer	*Charadrius vociferus*	0	0.0	0	0.0
Brown-headed Cowbird	*Molothrus ater*	1	0.4	0	0.0
American Crow	*Corvus brachyrhynchos*	1	0.4	6	4.3
Short-earred Owl	*Asio flammeus*	1	0.4	0	0.0
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0	0	0.0
Greater Sage Grouse	*Centrocercus urophasianus*	5	1.8	0	0.0
Long-billed Curlew	*Numenius americanus*	0	0.0	0	0.0
Black-billed Magpie	*Pica hudsonia*	0	0.0	2	1.1.
Unknown		7	2.5	0	0.0
Total Birds		**279**	**100**	**139**	**100**

*Note: Includes birds observed, heard, or sign observed (e.g., feathers, nests, roosts)

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Table 3.5-8a Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Rangeland Area
(Page 2 of 2)

Species		January 2009 Observed*	April 2009 Observed*
Horned Lark	*Eremophila alpestris*	X	X
Western Meadowlark	*Stumella neglecta*		X
Sage Thrasher	*Oreoscoptes montanus*		X
Northern Harrier	*Circus cyaneus*	X	
Brewer's Sparrow	*Spizella breweri*		X
Chipping Sparrow	*Spizella passerina*		
Sage Sparrow	*Amphispiza belli*		X
Vesper Sparrow	*Pooecetes gramineus*		
Grasshopper Sparrow	*Ammodramus savannarum*		
Mourning Dove	*Zenaida macroura*		
Kildeer	*Charadrius vociferus*		
Brown-headed Cowbird	*Molothrus ater*		
American Crow	*Corvus brachyrhynchos*	X	X
Short-earred Owl	*Asio flammeus*		
Red-tailed Hawk	*Buteo jamaicensis*	X	X
Greater Sage Grouse	*Centrocercus urophasianus*	X	X
Long-billed Curlew	*Numenius americanus*		
Black-billed Magpie	*Pica hudsonia*		
Prairie Falcon	*Falco mexicanus*		X
Brewer's Blackbird	*Euphagus cyanocephalus*		X
Unknown			

***Note: Includes birds observed, heard, or sign observed (e.g., tracks, scat, etc.)**

Table 3.5-8b Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Non-irrigated Seeded Pasture Area

(Page 1 of 4) 2

Insert new Table 3.4-8b, page 2 of 2, after this page

Species		June 2008		October 2008	
		Total Number*	% of Total Number	Total Number*	% of Total Number
Horned Lark	*Eremophila alpestris*	58	68.2	32	74.4
Western Meadowlark	*Sturnella neglecta*	8	9.4	0	0.0
Sage Thrasher	*Oreoscoptes montanus*	1	1.2	0	0.0
Northern Harrier	*Circus cyaneus*	1	1.2	1	2.3
Brewer's Sparrow	*Spizella breweri*	11	12.9	0	0.0
Chipping Sparrow	*Spizella passerina*	0	0.0	0	0.0
Sage Sparrow	*Amphispiza belli*	0	0.0	0	0.0
Vesper Sparrow	*Pooecetes gramineus*	3	3.5	0	0.0
Grasshopper Sparrow	*Ammodramus savannarum*	0	0.0	0	0.0
Mourning Dove	*Zenaida macroura*	0	0.0	4	9.3
Killdeer	*Charadrius vociferus*	1	1.2	0	0.0
Brown-headed Cowbird	*Molothrus ater*	1	1.2	0	0.0
American Crow	*Corvus brachyrhynchos*	1	1.2	4	9.3
Short-earred Owl	*Asio flammeus*	0	0.0	0	0.0
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0	0	0.0
Greater Sage Grouse	*Centrocercus urophasianus*	0	0.0	0	0.0
Long-billed Curlew	*Numenius americanus*	0	0.0	0	0.0
Black-billed Magpie	*Pica hudsonia*	0	0.0	2	4.7
Unknown		0	0.0	0	0.0
Total Birds		**85**	**100**	**43**	**100**

*Note: Includes birds observed, heard, or sign observed (e.g., feathers, nests, roosts)

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Table 3.5-8b Avian Transect Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site - Non-irrigated Seeded Pasture Area

(Page 2 of 2)

Species		January 2009 Observed**	April 2009 Observed*
Horned Lark	*Eremophila alpestris*	**	X
Western Meadowlark	*Sturnella neglecta*	**	X
Sage Thrasher	*Oreoscoptes montanus*	**	
Northern Harrier	*Circus cyaneus*	**	
Brewer's Sparrow	*Spizella breweri*	**	X
Chipping Sparrow	*Spizella passerina*	**	
Sage Sparrow	*Amphispiza belli*	**	
Vesper Sparrow	*Pooecetes gramineus*	**	
Grasshopper Sparrow	*Ammodramus savannarum*	**	
Mourning Dove	*Zenaida macroura*	**	
Killdeer	*Charadrius vociferus*	**	
Brown-headed Cowbird	*Molothrus ater*	**	
American Crow	*Corvus brachyrhynchos*	**	X
Short-earred Owl	*Asio flammeus*	**	
Red-tailed Hawk	*Buteo jamaicensis*	**	
Greater Sage Grouse	*Centrocercus urophasianus*	**	
Long-billed Curlew	*Numenius americanus*	**	
Black-billed Magpie	*Pica hudsonia*	**	X
Unknown		**	

***Note: Includes birds observed, heard, or sign observed (e.g., tracks, scat, etc.)**

****Note: During the January 2009 surveys, cattle were concentrated on the non-irrigated seeded pasture portion of the site and were fed via tractor on most mornings. As such, this area was avoided during winter surveys, as wildlife occurrence would be reduced by the livestock occupation and associated feeding activities.**

Table 3.5-8c Avian Point Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site- Crop Area

(Page 1 of ~~4~~ 2)

Insert new Table 3.4-8c, page 2 of 2, after this page

Species		June 2008							October 2008						
		Total	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5	Total	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5
Horned Lark	*Eremophila alpestris*	17	54.8				10	7	50	82	14	10	9	10	7
Western Meadowlark	*Sturnella neglecta*	4	12.9				1	3	0	0.0					
Sage Thrasher	*Oreoscoptes montanus*	0	0.0						0	0.0					
Northern Harrier	*Circus cyaneus*	4	12.9	2	1			1	1	1.6					1
Brewer's Sparrow	*Spizella breweri*	0	0.0						0	0.0					
Chipping Sparrow	*Spizella passerine*	0	0.0						0	0.0					
Sage Sparrow	*Amphispiza belli*	0	0.0						0	0.0					
Vesper Sparrow	*Pooecetes gramineus*	0	0.0						0	0.0					
Grasshopper Sparrow	*Ammodramus savannarum*	0	0.0						0	0.0					
Mourning Dove	*Zenaida macroura*	2	6.5		2				4	6.6		2			2
Kildeer	*Charadrius vociferous*	0	0.0						0	0.0					
Brown-headed Cowbird	*Molothrus ater*	0	0.0						0	0.0					
American Crow	*Corvus brachyrhynchos*	0	0.0						5	8.2	1		1	3	
Short-earred Owl	*Asio flammeus*	0	0.0						0	0.0					
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0						0	0.0					
Greater Sage Grouse	*Centrocercus urophasianus*	0	0.0						0	0.0					
Long-billed Curlew	*Numenius americanus*	4	12.9	2	1	1			0	0.0					
Black-billed magpie	*Pica hudsonia*	0	0.0						1	1.6	6				1
Unknown		0	0.0						0	0.0					
Total		**31**	**100**	**4**	**4**	**1**	**11**	**11**	**61**	**100**	**15**	**12**	**10**	**13**	**11**

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Table 3.5-8c Avian Point Survey Data Summary for the Proposed Eagle Rock Enrichment Facility Site- Crop Area
(Page 2 of 2)

Species		January 2009						April 2009						
		Total*	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Total*	% Observed	Pt 1	Pt 2	Pt 3	Pt 4	Pt 5
Horned Lark	*Eremophila alpestris*	1	33.3		1			33	71.7	7	4	3	11	8
Western Meadowlark	*Sturnella neglecta*	0	0.0					7	15.2	2				5
Sage Thrasher	*Oreoscoptes montanus*	0	0.0					0	0.0					
Northern Harrier	*Circus cyaneus*	0	0.0					0	0.0					
Brewer's Sparrow	*Spizella breweri*	0	0.0					3	6.6	2				1
Chipping Sparrow	*Spizella passerine*	0	0.0					0	0.0					
Sage Sparrow	*Amphispiza belli*	0	0.0					2	4.3					2
Vesper Sparrow	*Pooecetes gramineus*	0	0.0					0	0.0					
Grasshopper Sparrow	*Ammodramus savannarum*	0	0.0					0	0.0					
Mourning Dove	*Zenaida macroura*	0	0.0					0	0.0					
Kildeer	*Charadrius vociferous*	0	0.0					0	0.0					
Brown-headed Cowbird	*Molothrus ater*	0	0.0					0	0.0					
American Crow	*Corvus brachyrhynchos*	1	33.3		1			1	2.2			1		
Short-earred Owl	*Asio flammeus*	0	0.0					0	0.0					
Red-tailed Hawk	*Buteo jamaicensis*	0	0.0					0	0.0					
Greater Sage Grouse**	*Centrocercus urophasianus*	1**	33.3		1**			0	0.0					
Long-billed Curlew	*Numenius americanus*	0	0.0					0	0.0					
Black-billed magpie	*Pica hudsonia*	0	0.0					0	0.0					
Unknown		0	0.0					0	0.0					
Total		**3**	**100**		**3**			**46**	**100**	**11**	**4**	**4**	**11**	**16**

* **Note: Includes animals seen, heard, or sign observed (e.g., tracks, scat, etc)**
** **Note: Tracks of greater sage grouse present at point location, no individuals seen.**

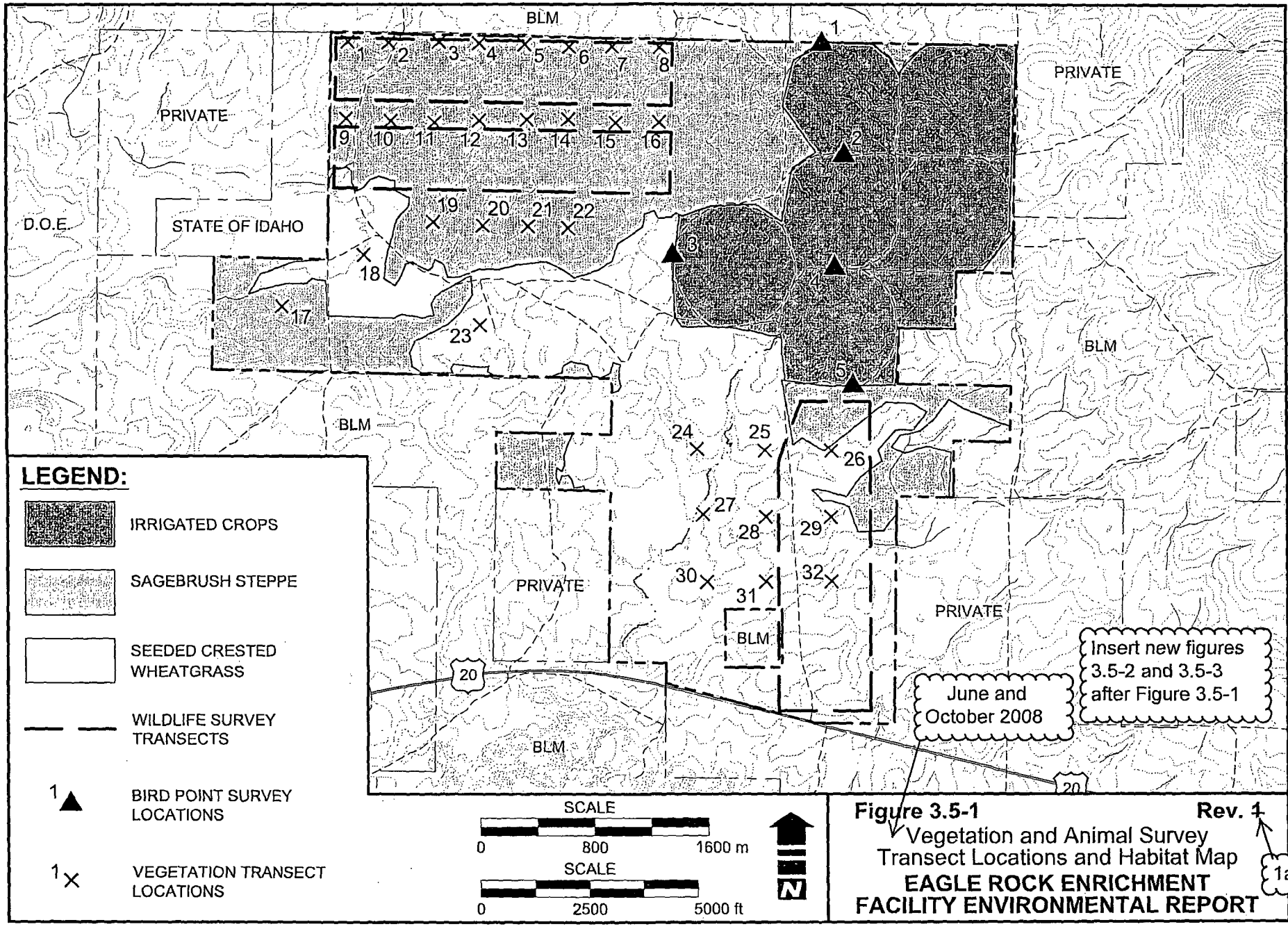

Figure 3.5-1 **Rev. 1**

Vegetation and Animal Survey Transect Locations and Habitat Map

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

1a

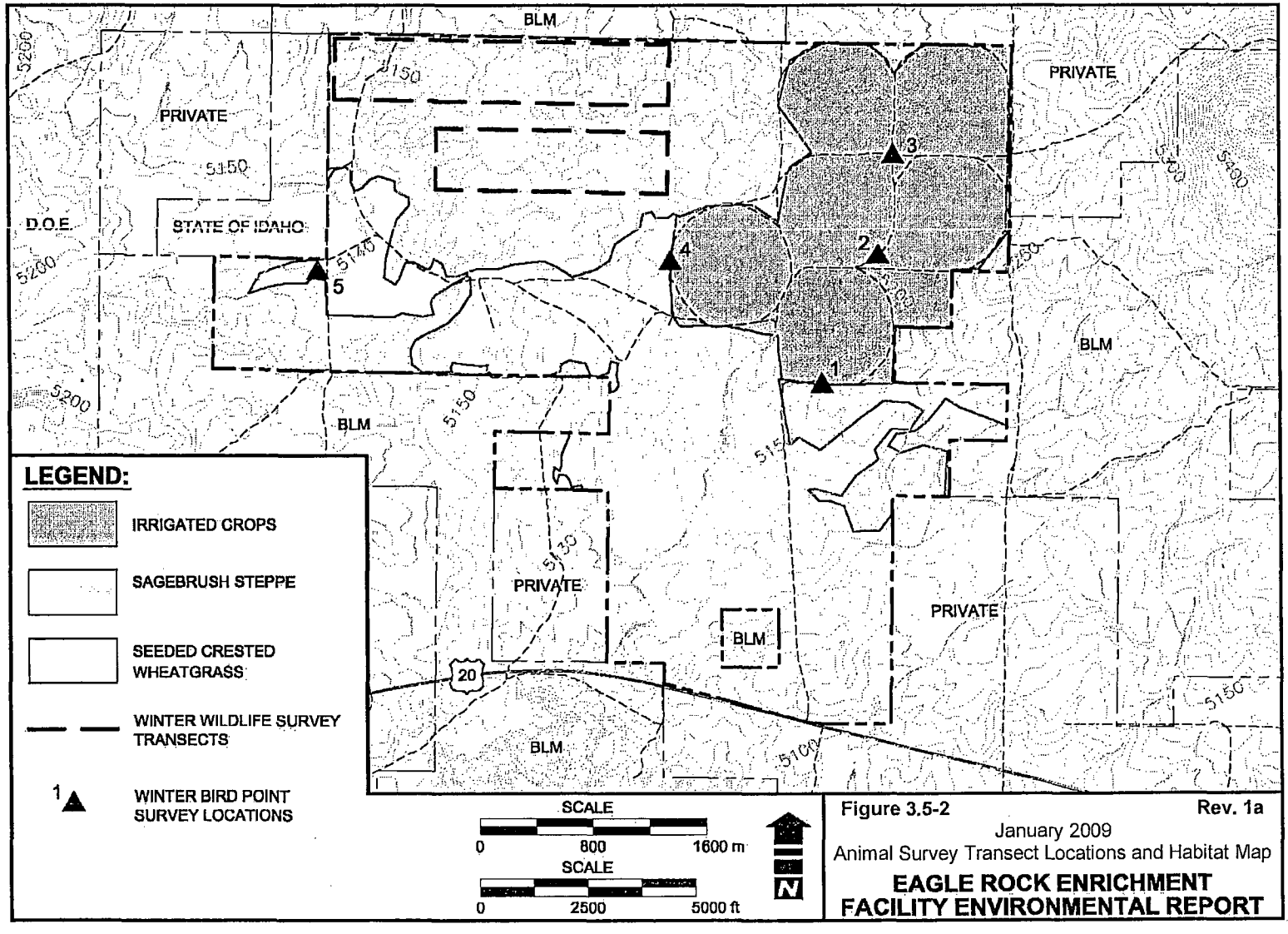

Figure 3.5-2 **Rev. 1a**

January 2009

Animal Survey Transect Locations and Habitat Map

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

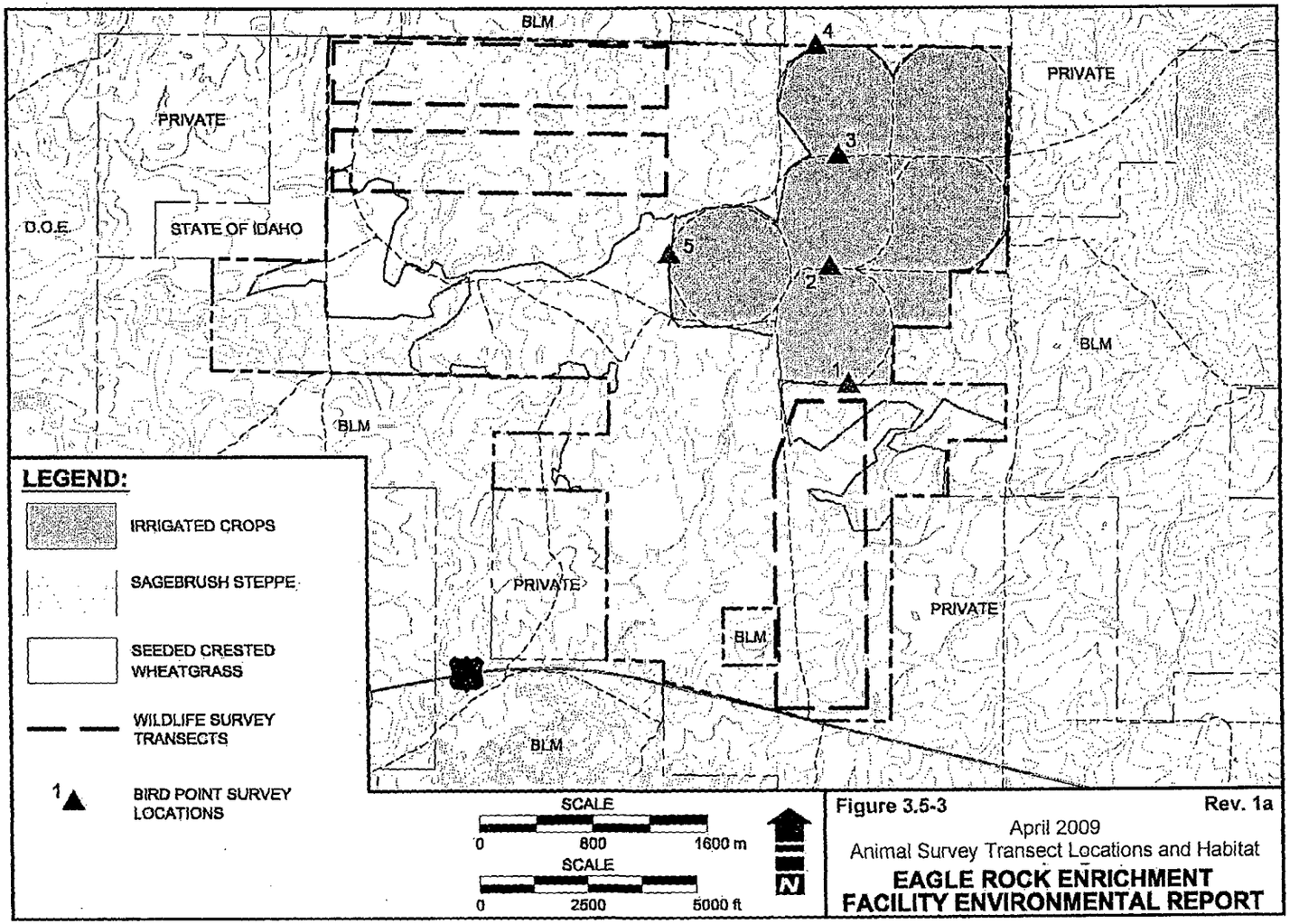

Figure 3.5-3 Rev. 1a

April 2009

Animal Survey Transect Locations and Habitat

EAGLE ROCK ENRICHMENT FACILITY ENVIRONMENTAL REPORT

access to the remaining habitat on the proposed site. Removal of livestock will likely improve cover and vegetation diversity of the remaining sagebrush steppe and seeded crested wheatgrass vegetation types. This improvement may increase the carrying capacity and use of the remaining acres for pronghorn use.

Impacts to greater sage grouse will be similar to those for general wildlife relying on the sagebrush steppe habitat. About 75 ha (185 ac) of sagebrush steppe habitat that could be used for nesting, roosting, and brood rearing will be lost. Greater sage grouse are birds that require large expanses of habitat. Home ranges for non-migratory greater sage grouse have been reported to vary between 11 to 31 km^2 (4-12 mi^2) (Crawford, 2004) (Utah DNR, 2002). This is equivalent to approximately 1,100 ha (2,718 ac) to 3,100 ha (7,660 ac). The median distance traversed by birds from nests to summer/fall range has been reported to be 20.9 km (13 mi) (Fischer, 1993) while hens in Idaho nest an average of 3-5 km (2-3 mi) from their lek of capture but may move more than 8 km (5 mi) to nest (Connelly, 2004). Because greater sage grouse require large areas, the proposed site, which is 1,700 ha (4,200 ac) in size, likely supports only a few birds. The area of sagebrush steppe directly affected by land clearing is about 75 ha (185 ac) which is less than 10% of the median home range for a bird.

Portions of the remaining habitat will be avoided or used less frequently due to noise, human presence, and night lighting. Greater sage grouse mortality may increase if raptors use the remaining habitat more heavily due to increased numbers of perch sites. Removal of grazing may improve the remaining sagebrush steppe vegetation and may increase greater sage grouse use of this vegetation along the western portions of the proposed site. Noise during construction may affect the lek activity and decrease numbers of birds at this lek during breeding season. Maximum construction noise levels will be about 35 dBA at the nearest known lek, which is within ambient noise levels measured in June 2008. This lek is between 6.4 and 8 km (4 and 5 mi) from the proposed site. Therefore, breeding success at this lek may be affected. All other known leks are over 8 km (5 mi) from the proposed EREF site and will not be affected. Therefore, impacts to greater sage grouse from the proposed EREF will be small.

Impacts to the pygmy rabbit may be similar to those for general wildlife relying on the sagebrush steppe habitat. About 75 ha (185 ac) of sagebrush steppe habitat will be lost. Pygmy rabbits and sign were not observed during ~~June and October 2008~~ surveys. Pygmy rabbits and sign were not observed during surveys conducted on two areas on the INL within 3.2 km (2 mi) of the proposed site and on several other INL areas within 8 km (5 mi) of the proposed EREF site. However, rabbits have been observed during surveys on the INL about 8.7 km (5.4 mi) from the proposed site. If pygmy rabbits are present, portions of the remaining habitat will be avoided or used less frequently due to noise and human presence. Pygmy rabbit mortality may increase if raptors use the remaining habitat more heavily due to increased numbers of perch sites. Conversely, removal of grazing may improve the remaining sagebrush steppe vegetation and increase pygmy rabbit use along the western portions of the proposed site.

Impacts to migratory birds will include loss of breeding, nesting habitat, roosting, rearing, and feeding habitat. All three vegetation types totaling 240 ha (592 ac) provide some habitat for selected species of migratory birds. Therefore, the loss of habitat will result in birds relocating to adjacent habitat. None of the habitat is unique and remaining habitat may improve as grazing is eliminated, thereby, potentially offsetting some of the impacts. In addition, precautions will be taken when conducting site preparation activities (e.g., land clearing) during nesting season to further minimize impacts to migratory birds.

June 2008, October 2008, January 2009, and April 2009

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Terracon also performed three natural dry density tests (ASTM D2216-98) and one swell consolidation test (ASTM D2435-02) on these samples. The laboratory results are included in Section 8.0, and the results of the index testing are shown on Table E.1

Between April 21 and May 8, 2008, Crux Subsurface Inc, continuously cored the bedrock using an HQ core barrel and 1.52 m (5 foot) runs to a total depth of 222.65 m (730.5 feet) as part of the construction of a groundwater monitoring well. This well is identified as GW-1 and is one of a series of wells constructed as part of a hydro geological investigation. It was the only well cored at that time. The groundwater well locations, including GW-1, are shown on Figure E.1. The GW-1 core log is included in Section 7.0.

6.2

Subsequent to the November 2007 drilling, the proposed facility location was moved approximately 1,220m (4,000 feet) to the east. Between May 12 and May 13, 2008, an additional 10 borings were drilled to better define subsurface conditions at the adjusted facility location. These borings are designated as BH21 to BH30 and ranged in depth from 0.15 to ~~6.6~~ m (0.5 to ~~21.5~~ feet). Andrew Well Drilling Service drilled and sampled to bedrock using the same-sized hollow stem augers, sampling equipment and intervals as in the previous investigation. The borings are shown on Figure E.1 and the boring logs are included in Section 7.0.

20.5

As part of the May 2008 subsurface investigation, 11 soil samples were selected for laboratory analysis at Terracon Laboratories (Fort Collins, CO). Analyses performed included 9 natural moisture content tests (ASTM D2216-98), 4 Atterberg limit tests (ASTM D4318-00), 2 specific gravity tests (ASTM D854-06), 2 swell consolidation tests (ASTM D2435-02), 2 proctor compaction tests (ASTM D1557-02), and 2 Resistance R-Value tests (ASTM D2844-01). In addition, Terracon also performed 2 pH tests [AASHTO T289-91-UL (2004)], 2 resistivity tests [AASHTO T288-91-UL (2004)], and 2 tests for water soluble sulfate [AASHTO T290-95-UL (2003)]. The laboratory results are included in Section 8.0, and the results of the index testing are shown on Table E.1. The results of the chemical testing are shown on Table E.2.

In addition to the subsurface investigations, soil and bedrock mapping was also performed between May 14 and May 16. This mapping provided some additional information regarding the site bedrock structure, overburden, and site drainage patterns.

4.0 SUBSURFACE CONDITIONS

4.1 SOIL CONDITIONS

6.2 m (20.5 ft)

Soils at the site are reported to be of eolian origin and directly overlie basalt lava flows. Soil generally ranges in thickness from 0 to 4.3m (0 to 14 feet), although soil was found approximately ~~6.6 m (21.5 ft)~~ thick at BH30. Basalt outcrops are intermittently exposed and in total comprise about 14% of the site ground surface area.

Field identification and laboratory testing indicate that the soil is primarily lean clay and lean clay with sand (CL) with colors such as light tan, tan, light brown~~, grayish brown~~ and dark brown. The natural moisture content ranges from 9.6 to 19% and the Plasticity Index (PI) ranges from 10 to 24.

The Standard Penetration Test (SPT) field N-values ranged from 1 to 43 suggesting a low plasticity clay that ranges from very soft to hard. The median value (18 blows per ft) suggests a medium stiff clay. Because rock fragments were noted in samples associated with high blow counts, it is possible that these high values are biased and do not reflect soil strength. The natural dry density ranged from 1.30 to 1.79 g/cm^3 (81.2 to 112 lbs/ft^3).

1a

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1a

Table E.1 - Summary of Soil Index Property Testing
(Page 1 of 1)

Boring	Depth (m [(ft])	Specific Gravity	Natural Moisture Content (%)	Natural Dry Density (g/cm³ [pcf])	Gradation					Atterberg Limits		Soil Type
					Gravel (%)	Sand (%)	Fines (%)	Silt (%)	Clay (%)	LL (%)	PI (%)	
BH1	3.0 [10]		15.5	1.67 [104.4]	2.1	14.3	84			35	16	CL
BH5	1.5 [5]		13.6		0.2	6	93.8	72.7	21.1	29	13	CL
BH6	1.5 [5]		9.6		4		96			31	13	CL
BH7	1.5 [5]		14.1	1.79 [112]	9		91			36	17	CL
BH10	1.5 [5]		10.9		0.1	10.9	89			29	11	CL
BH12	3.2 [10.5]		12.0	1.41 [88]	0	2	98			35	15	CL
BH14	1.5 [5]		11.8		0	6	94			27	10	CL
BH18	1.6 [5.5]		15.1		0.4	8.6	91	58.5	32.5	31	14	CL
BH22	1.5 [5]		16.3									CL
BH23	~~1.5~~ [1]						89			36	12	CL
BH23	1.5 [5]	2.69					87			33	14	CL
BH25	1.6 [5.5]	2.7	14.9				86			42	24	CL
BH28	1.5 [5]		10.6									CL
BH29	1.6 [5.5]		13.0	1.30 [81.2]								CL
BH29	~~1.5~~ [10]		16.0									CL
BH30	1.6 [5.5]		10.7	1.45 [90.4]			97			35	16	CL
BH30	3.2 [10.5]		12.7									CL
BH30	4.7 [15.5]		14.7									CL
BH30	~~6.6 [21.5]~~		19.0									CL

0.3

3.0

6.2 [20.5]

Specific Gravity	ASTM D854-06
Natural Moisture Content	ASTM D2216-98
Natural Dry Density	ASTM D2216-98
Grain Size Analysis	ASTM D422-63R02
Atterberg Limits	ASTM D4318-00

1a

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring: **BH20**
Sheet No.: 1 of 1
Job No.:

Date Started:	11/27/2007	Date Completed:	11/27/2007	Logged By: MMB	Checked By:
Total Depth (ft):	~~11.5~~ ft	Depth to Water (ft):		Northing: 697398.230	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 581275.579	Ground Elev.: 5148.46

6

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. tan clay, dry	CL			Observations from cuttings
			5'	ROCK	4	7	
			Lt. brown clay, dry	ROCK			
			6'				
			Refusal				
10	5138.46						
			See BH20 SOIL BORING LOG from Geotech Report, Rev 6 (attached)				
20	5128.46						
30	5118.46						
40	5108.46						
50	5098.46						
60	5088.46						
70	5078.46						

1a

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH20**
Sheet No.:	1 of 1
Job No.:	

Date Started:	11/27/2007	Date Completed:	11/27/2007	Logged By: MMB	Checked By:
Total Depth (ft):	6 ft	Depth to Water (ft):		Northing: 697398.230	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 581275.579	Ground Elev.: 5148.46

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Lt. tan clay, dry	CL			Observations from cuttings
			5'	ROCK	4	7	
			Lt. brown clay, dry	ROCK			
			6'				
			Refusal				
10	5138.46						
20	5128.46						
30	5118.46						
40	5108.46						
50	5098.46						
60	5088.46						
70	5078.46						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	BH28
Sheet No.:	1 of 1
Job No.:	

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	> 4 ft	Depth to Water (ft):		Northing: 698977.686	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 585949.646	Ground Elev.: 5175.61

6

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Light brown silty clay, dry.	CL			Observations from cuttings
			5'				
			tan silty clay, powdery dry.	CL		19	
			6'	ROCK			
			Refusal				
10	5165.61						
20	5155.61						
30	5145.61						
40	5135.61						
50	5125.61						
60	5115.61						
70	5105.61						

See BH28 SOIL BORING LOG from Geotech Report, Rev 6 (attached)

1a

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH28**
Sheet No.:	1 of 1
Job No.:	

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	6 ft	Depth to Water (ft):		Northing: 698977.686	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 585949.646	Ground Elev.: 5175.61

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			Light brown silty clay, dry.	CL			Observations from cuttings
			5'				
			tan silty clay, powdery dry.	CL		19	
			6'	ROCK			
			Refusal				
10	5165.61						
20	5155.61						
30	5145.61						
40	5135.61						
50	5125.61						
60	5115.61						
70	5105.61						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring: BH29
Sheet No.: 1 of 1
Job No.:

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	~~11~~ ft	Depth to Water (ft):		Northing: 697669.188	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 585950.128	Ground Elev.: 5169.69

12

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, moist with alligator cracking at surface.	CL			Observations from cuttings.
			5'				
			Soil is tan silty clay, moist. Not much cohesion.	CL	6"	33	Observations from sample.
			6'	CL			Observations from cuttings.
			Brown silty clay, moist.				
10	5159.69		10'	CL	12"	21	Observations from sample.
			Brown silty clay, moist, more cohesive.	ROCK			
			11'				
			Refusal				
20	5149.69						
30	5139.69						
40	5129.69						
50	5119.69						
60	5109.69						
70	5099.69						

Change line and elevation to 12 '

See BH29 SOIL BORING LOG from Geotech Report, Rev 6 (attached)

1a

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH29**
Sheet No.:	1 of 1
Job No.:	

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	12 ft	Depth to Water (ft):		Northing: 697669.188	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 585950.128	Ground Elev.: 5169.69

Notes: USCS classification was interpreted based on laboratory test results from adjacent boreholes.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, moist with alligator cracking at surface.	CL			Observations from cuttings.
			5'				
			Soil is tan silty clay, moist. Not much cohesion.	CL	6"	33	Observations from sample.
			6'	CL			Observations from cuttings.
			Brown silty clay, moist.				
10	5159.69		10'	CL	12"	21	Observations from sample.
			Brown silty clay, moist, more cohesive.				
			12'	ROCK			
			Refusal				
20	5149.69						
30	5139.69						
40	5129.69						
50	5119.69						
60	5109.69						
70	5099.69						

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

Project: *Bonneville Idaho Site*
Feature:

Boring:	BH30
Sheet No.:	1 of 1
Job No.:	

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	~~21.5~~ ft	Depth to Water (ft):		Northing: 701729.591	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 584478.389	Ground Elev.: 5190.33

20.5

Notes: USCS Classification for sample taken at 5.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, dry	CL			Observations from cuttings
			5'				
			Soil is brown clumpy silty clay, moist.	CL	6"	43	Observations from sample
			6'	CL			Observations from cuttings
			Brown silty clay, moist.				
10	5180.33		10'				
			Brown silty clay, moist.	CL	6"	11	Observations from sample
			11'	CL			Observations from cuttings
			Brown silty clay, moist				
			15'				
			Brown silty clay, moist	CL	8"	14	Observations from sample
			16'	CL			Observations from cuttings
			Brown silty clay, moist				
20	5170.33		20'				
			Brown silty clay, moist	CL	12	18	Observations from sample
			21'6"	ROCK			
			Refusal				
30	5160.33						
40	5150.33						
50	5140.33						
60	5130.33						
70	5120.33						

Change line and elevation to 20'6"

See BH30 SOIL BORING LOG from Geotech Report, Rev 6 (attached)

1a

SOIL BORING LOG

MWH MONTGOMERY WATSON HARZA

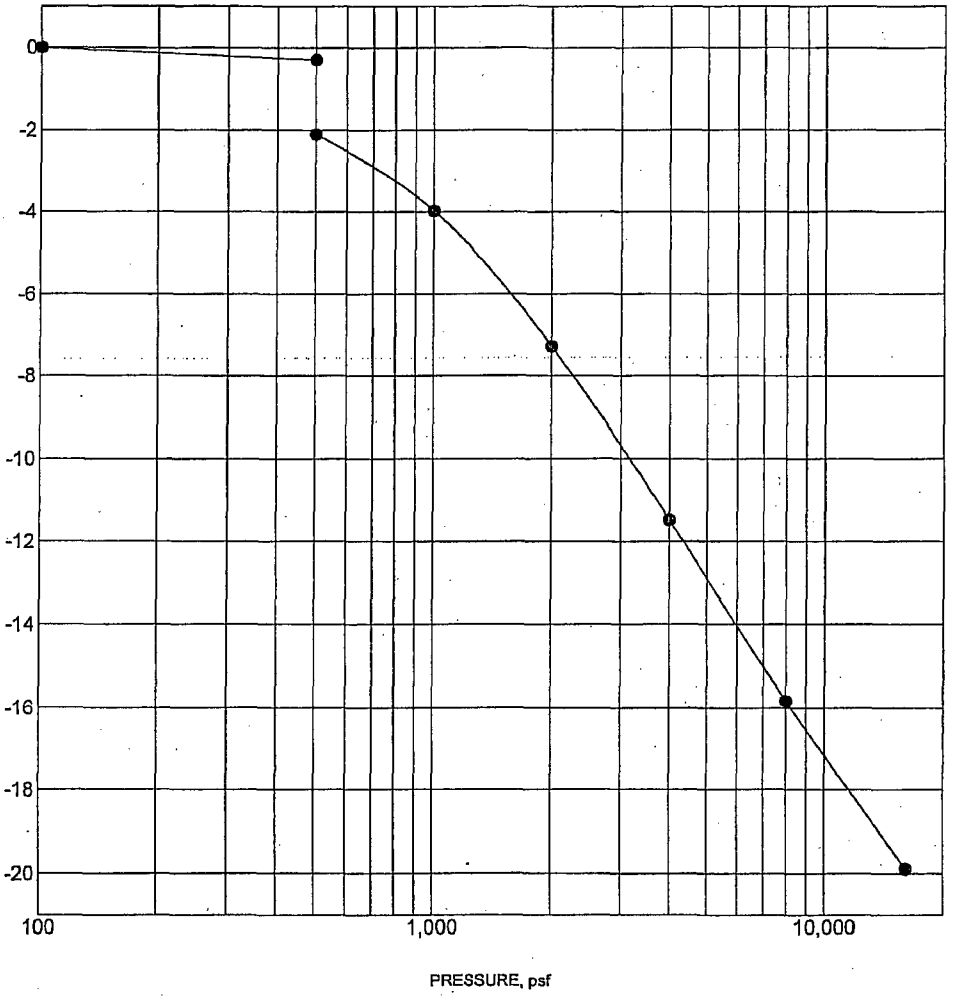
Project: *Bonneville Idaho Site*
Feature:

Boring:	**BH30**
Sheet No.:	1 of 1
Job No.:	

Date Started:	05/12/2008	Date Completed:	05/12/2008	Logged By: MMB	Checked By:
Total Depth (ft):	20.5 ft	Depth to Water (ft):		Northing: 701729.591	Vertical Angle:
Drilling Contr.:	Andrew Well Drilling	Driller:	Jared	Easting: 584478.389	Ground Elev.: 5190.33

Notes: USCS Classification for sample taken at 5.5 ft was verified by laboratory testing. USCS Classifications for remainder of boring were interpreted based on laboratory test results.

Depth (ft)	Elevation (ft)	Lithology (Graphic Symbols)	Lithographic Descriptions	USCS Class	Recovery (in)	N value	Notes and Observations (Sample/Test Data, Water Levels, Drilling Characteristics, Casing Depths, Core Box No.)
0			tan to brown silty clay, dry	CL			Observations from cuttings
			5'	CL	6"	43	Observations from sample
			Soil is brown clumpy silty clay, moist. 6'	CL			Observations from cuttings
			Brown silty clay, moist.				
10	5180.33		10'	CL	6"	11	Observations from sample
			Brown silty clay, moist. 11'	CL			Observations from cuttings
			Brown silty clay, moist				
			15'	CL	8"	14	Observations from sample
			Brown silty clay, moist 16'	CL			Observations from cuttings
			Brown silty clay, moist				
20	5170.33		20'	ROCK	12	18	Observations from sample
			Brown silty clay, moist 20'6"				
			Refusal				
30	5160.33						
40	5150.33						
50	5140.33						
60	5130.33						
70	5120.33						



Specimen Identification	Classification	γ_d, pcf	WC,%
● BH 12 10.5ft	LEAN CLAY(CL)	88	12

Notes:

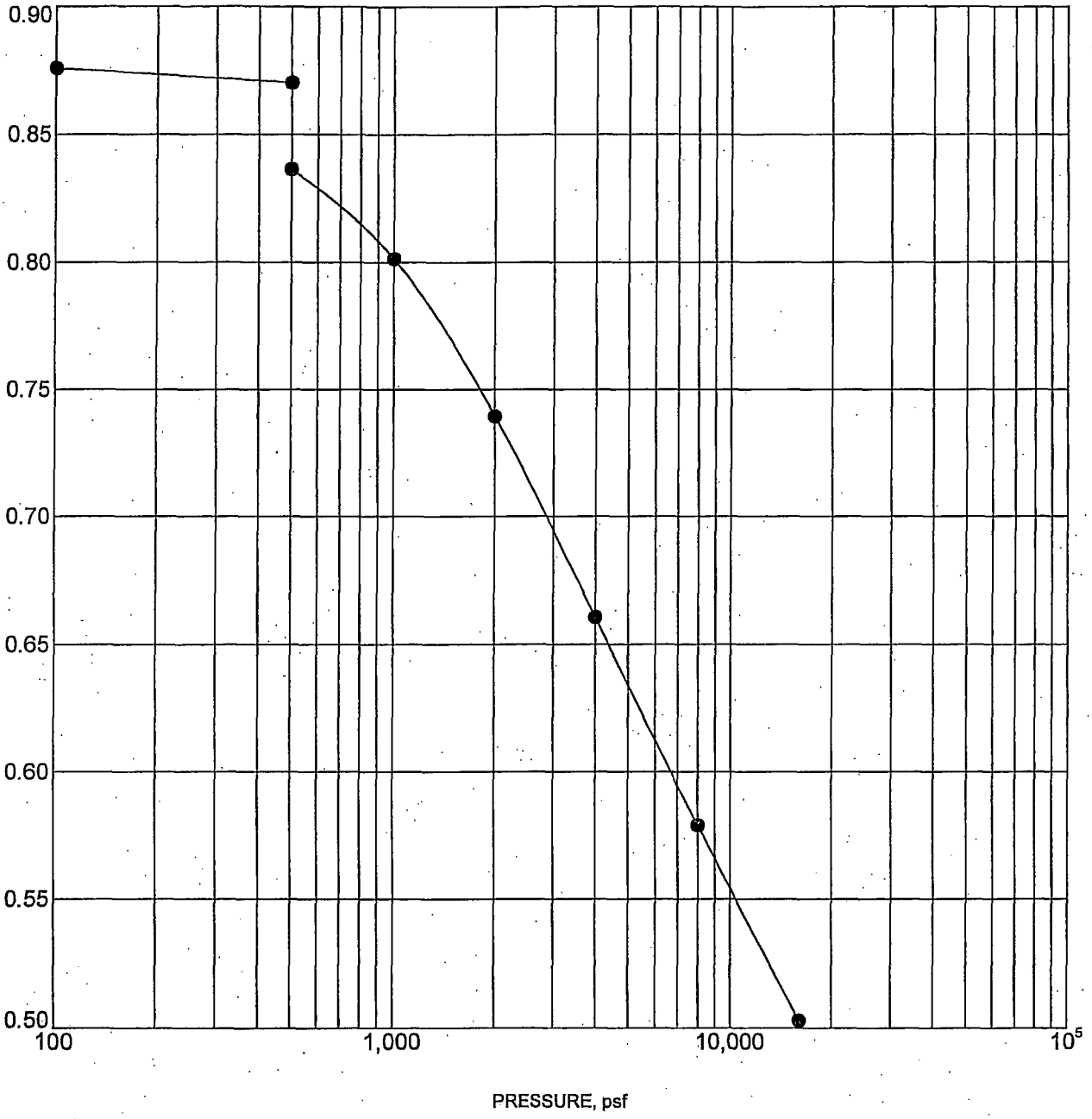
TC CONSOL STRAIN 20045108.GPJ TERRACON TEST.GDT 12/10/07

Terracon

SWELL CONSOLIDATION TEST

Project: Laboratory Testing
Site: Fort Collins, Colorado
Job #: 20075108
Date:

Insert BH12 10.5 FT CONSOLIDATION TEST after this page in Section 8.1 of ER Appendix E (see attached BH12 10.5 FT CONSOLIDATION TEST from Geotech Report, Rev 6))



Specimen Identification		Classification	γ_d, pcf	WC,%
● BH 12	10.5ft	LEAN CLAY(CL)	88	12

Notes:

Terracon

CONSOLIDATION TEST

Project: Laboratory Testing
Site: Fort Collins, Colorado
Job #: 20075108

TC_CONSOL_VOID RATIO_2004510B.GPJ_TERRACON TEST.GDT 12/10/07