LMS/LEH/S07300-10.0
Level 4

Long-Term Surveillance and Maintenance Plan for the Former Laboratory for Energy-Related Health Research Federal Facility University of California–Davis

December 2021

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

AEC	U.S. Atomic Energy Commission
CDPH	California Department of Public Health
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CVRWQCB	Central Valley Regional Water Quality Control Board
DOE	U.S. Department of Energy
DTSC	California Department of Toxic Substances Control
EDPs area	Eastern Dog Pens area
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FFA	Federal Facility Agreement
LEHR	Laboratory for Energy-Related Health Research
LM	Office of Legacy Management
LMS	Legacy Management Support
LTS&M Plan	Long-Term Surveillance and Maintenance Plan
MOA	memorandum of agreement
QAPP	Quality Assurance Project Plan
Ra	radium
RD/RAWP	Remedial Design/Remedial Action Work Plan
ROD	Record of Decision
SMP	Soil Management Plan
SOP	standard operating procedure
SQL	structured query language
SQP	standard quality procedure
Sr	strontium
SWTs area	Southwest Trenches area
UC Davis	University of California–Davis
WDPs area	Western Dog Pens area

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1.0 Introduction

The objective of this Long-Term Surveillance and Maintenance Plan (LTS&M Plan) is to implement measures required to protect human health and the environment for the U.S. Department of Energy (DOE) areas at the Laboratory for Energy-Related Health Research (LEHR)/Old Campus Landfill Superfund site (also called the LEHR site) at the University of California–Davis (UC Davis) (Figure 1). Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the DOE areas of the site have been remediated, and it has been determined that residual contaminants in soil do not pose a threat to human health and the environment unless they are disturbed. The CERCLA remedies serve to maintain the protective conditions at the DOE areas mainly through the implementation of land-use controls, a Soil Management Plan (SMP), groundwater monitoring, site inspections, and reporting defined in the CERCLA Record of Decision (ROD) (DOE 2009b). This LTS&M Plan provides background information and the procedures required to implement the remedies (Table 1), as modified during the CERCLA first and second Five-Year Reviews (DOE 2016; DOE 2018; DOE 2021a).

In most cases, the specific procedures and information relating to DOE's compliance with the requirements in the ROD are documented in separate CERCLA plans and reports, which are incorporated into this LTS&M Plan by reference. These references are available online at https://www.lm.doe.gov/cercla/SiteSelector.aspx.

Table 1. Selected CERCLA Remedies for DOE Areas at LEHR

DOE Area	No Action/ No Further Action	Long-Term Groundwater Monitoring/Contingency Remediation	Land-Use Controls	
			Soil Management	No Residential
Radium/Strontium Treatment		✓	✓	
Domestic Septic System 1	✓			
Domestic Septic System 3		✓	✓	
Domestic Septic System 4		✓	✓	✓
Domestic Septic System 5	✓			
Domestic Septic System 6	✓			
Domestic Septic System 7	✓			
DOE Disposal Box	✓			
Dry Wells A–E		✓	✓	
Eastern Dog Pens			✓	
Southwest Trenches		✓	✓	
Western Dog Pens	✓			

1.1 Location

The LEHR site is east of Old Davis Road, about 3400 feet south of U.S. Interstate 80 in Solano County, California, in the southeast quarter of Section 21, Township 8 North, Range 2 East, Mount Diablo Base and Meridian (Figure 1). It is approximately 2 miles south of the city of Davis, in the southeast portion (south campus area) of the UC Davis campus. The site property is owned by the Regents of the University of California.

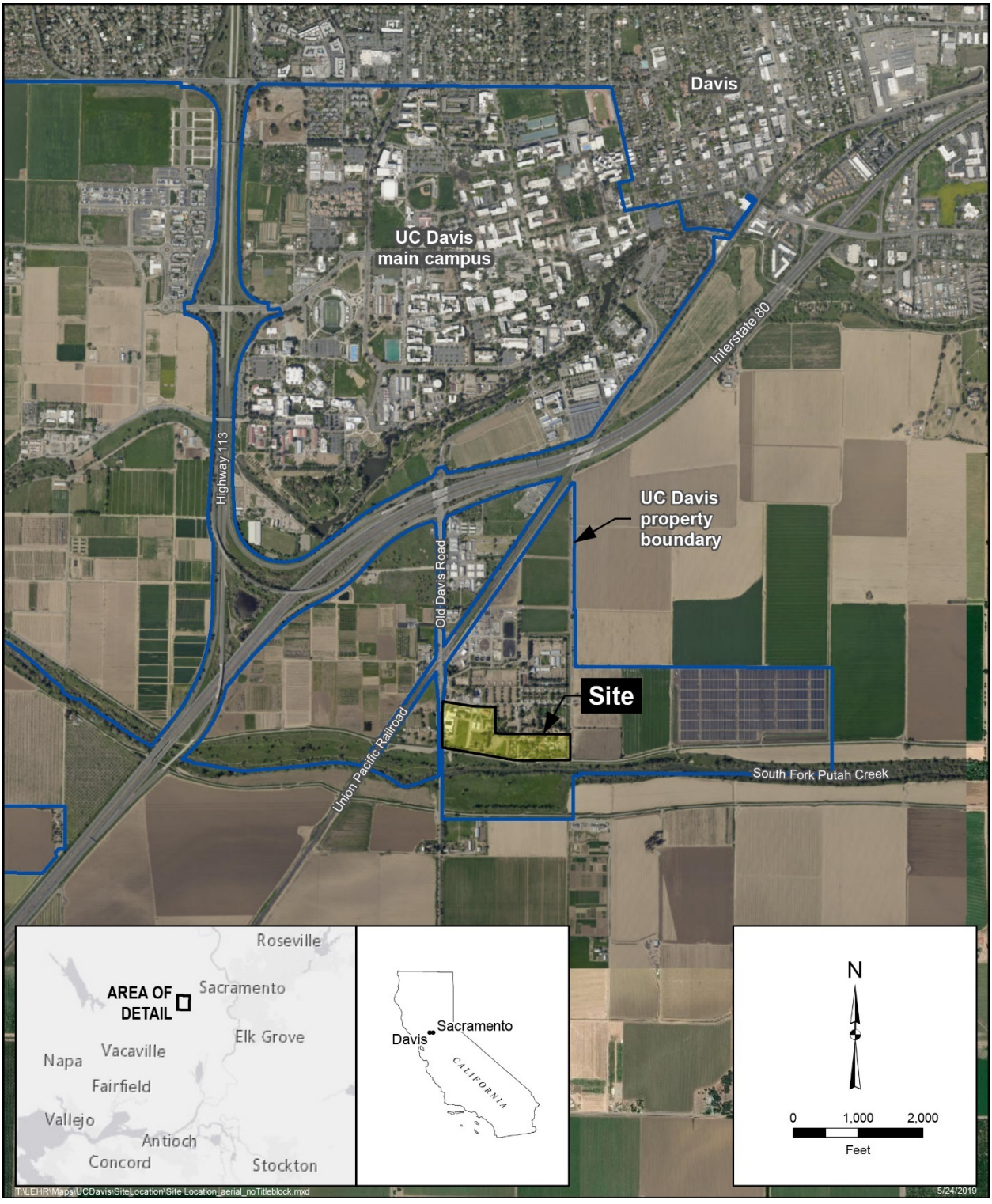

Figure 1. Location of the LEHR Site, UC Davis, Solano County, California

1.2 Site Description

The site is occupied by the UC Davis Center for Health and the Environment, which conducts toxicology, epidemiology, radiation biology, and radiochemistry research. The LEHR site is a former research facility that was operated by DOE and its predecessor agencies, including the U.S. Atomic Energy Commission (AEC), a DOE predecessor agency, until 1988. The site was placed on the National Priorities List (Superfund Site Identification Number CA2890190000) in May 1994 because contamination at the site was considered to pose a significant risk to human health and the environment.

DOE is the lead agency responsible for remediation and long-term management of the environmental impacts associated with past activities at the LEHR Federal Facility portion of the site. DOE oversees the site cleanup with support from the U.S. Environmental Protection Agency (EPA) Region 9, the California Department of Toxic Substances Control (DTSC), and the Central Valley Regional Water Quality Control Board (CVRWQCB). Current activities associated with the operation and management of the LEHR Federal Facility are funded by the DOE Office of Legacy Management (LM).

The site is composed of the LEHR Federal Facility and the UC Davis landfill areas, for which DOE and UC Davis are identified as respective responsible parties. The LEHR Federal Facility is defined in a Federal Facility Agreement (FFA) developed under CERCLA (EPA et al. 1999) signed in 1999 by DOE, EPA, the California Department of Health Services (now California Department of Public Health [CDPH]), and CVRWQCB. DTSC joined as a signatory to the FFA in 2000. In 2016, CDPH discontinued active participation in the project (Weiss 2016).

The FFA defines the LEHR Federal Facility as the following areas (see Figure 2):

- Maintenance Shop (H-212); Main Building (H-213); location of the former Imhoff Building (H-214); Reproductive Biology Laboratory (H-215); Specimen Storage (H-216); Interregional Project No. 4 (H-217); Animal Hospital No. 2 (H-218); Animal Hospital No. 1 (H-219); Co-60 Building (H-229); Occupational and Environmental Medicine Building (H-289); Co-60 Annex (H-290); Geriatrics Building No. 1 (H-292); Geriatrics Building No. 2 (H-293); Cellular Biology Laboratory (H-294); Small Animal Housing (H-296); Toxic Pollutant Health Research Laboratory (H-299); Storage Space (H-300)
- The Cobalt-60 Irradiation Field
- The radium (Ra)/strontium (Sr) leach fields, Imhoff storage tanks, and ^{226}Ra waste tanks (collectively identified herein as the Ra/Sr Treatment Systems)
- Seven septic tanks (including leach fields and dry wells)
- The Southwest Trenches area (SWTs area)
- The former Western Dog Pens area (WDPs area) and Eastern Dog Pens area (EDPs area) and associated soils and gravels
- The DOE Disposal Box

Areas where contamination originated, as listed above—excluding areas assigned to UC Davis—were documented in a memorandum of agreement (MOA) (Appendix A) between the Regents of the University of California and DOE (DOE 2009a [amended]).

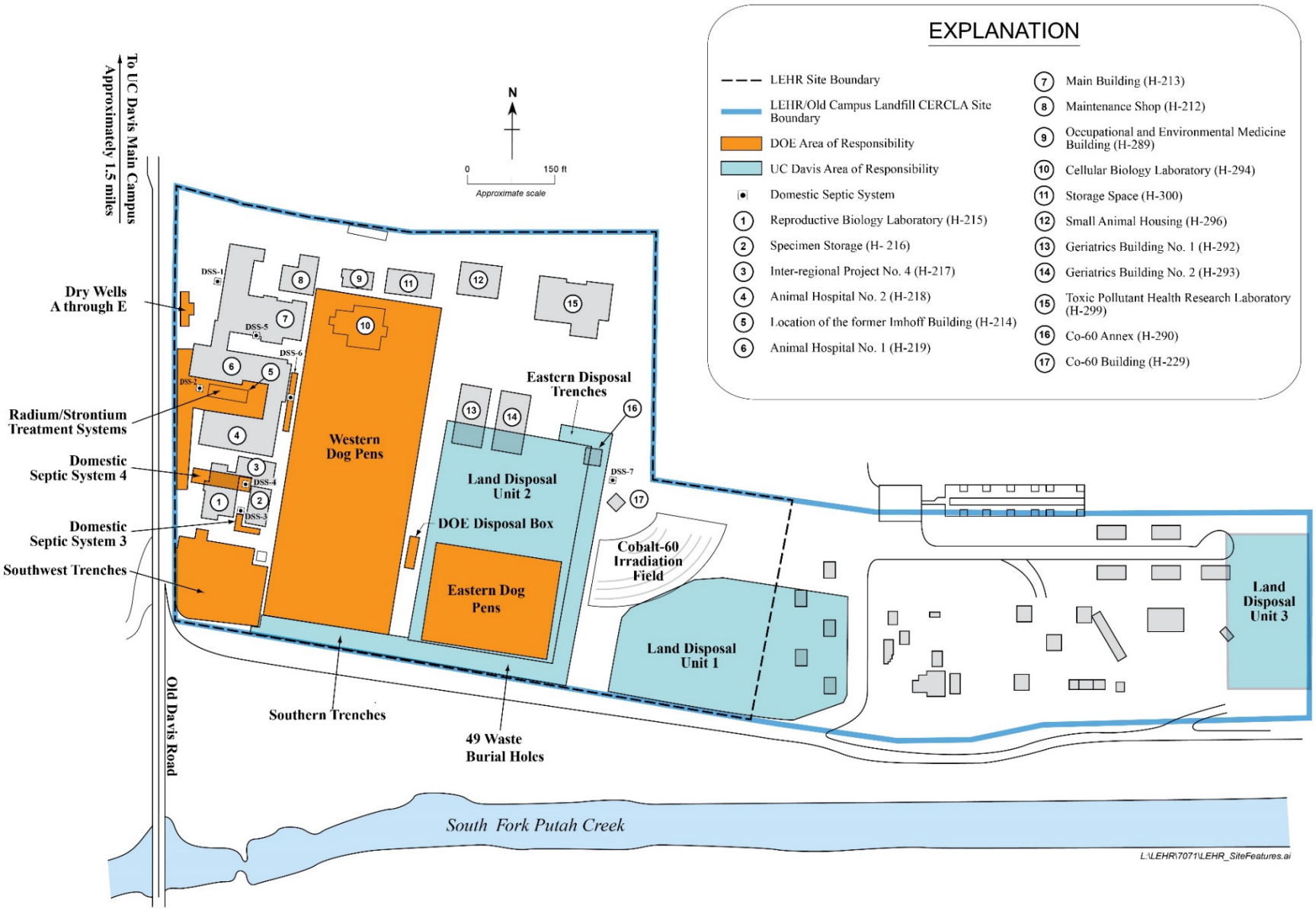

Figure 2. LEHR Site Features

1.3 Operational History

AEC sponsored radiological studies on laboratory animals at UC Davis in the early 1950s. While it was initially on the main campus, LEHR moved to its present location in 1958. Research at the LEHR site was focused on the health effects from chronic exposure to radionuclides, primarily ^{90}Sr and ^{226}Ra, using beagles as research subjects. Other related research was conducted at the site concurrently with these long-term studies. In the early 1970s, a cobalt-60 irradiation facility was constructed at the site (Figure 2) to study the health effects of chronic exposure to gamma radiation. All DOE-funded research activities at the LEHR site were terminated by 1988.

During operations, DOE disposed of or released some of the LEHR research waste, including low-level radioactive waste, in land disposal units, outdoor dog pens, and wastewater treatment and septic systems at the site (Figure 2). UC Davis operated two landfills within the LEHR site boundary (Figure 2) for disposal of UC Davis waste: Landfill Disposal Unit 1 from the early 1940s to the mid-1950s and Landfill Disposal Unit 2 from 1956 to 1967 (Weiss 2003a).

1.4 Cleanup History

From 1975 to 2009, DOE decontaminated and decommissioned above-grade portions of the LEHR Federal Facility including:

- Gravel and curbing from 64 pens in the northern portion of the WDPs area in 1975
- Aboveground portion of the Imhoff Wastewater Treatment Facility (Figure 2) in 1995
- Concrete pedestals and wooden kennels from the EDPs and WDPs areas in 1995 and 1996
- Animal Hospital No. 1 Building, Animal Hospital No. 2 Building, Specimen Storage Building, and Cobalt-60 Building (Figure 2)

DOE conducted several non-time-critical removal actions under CERCLA before issuing the ROD in 2009, including the following:

- The DOE Disposal Box area in 1996 (IT Corp 1997)
- The SWTs area in 1998 (Weiss 2001b)
- The Ra/Sr Treatment Systems area, Domestic Septic System 2, and parts of Dry Wells A through E (Figure 2) in 1999 and 2000 (Weiss 2001a)
- WDPs area in 2001 (Weiss 2002)
- Domestic Septic System 3 and 6 areas in 2002 (Weiss 2003b)

After completing the removal actions, DOE prepared a remedial investigation report in 2003 (Weiss 2003a) and jointly prepared a site-wide risk assessment with UC Davis from 2002 to 2005. The risk assessment showed that excess risk to human health from contaminants at the DOE Disposal Box; Ra/Sr Treatment Systems; Domestic Septic Systems 1, 2, 3, 5, and 6; and WDPs areas was reduced to below 1 in 1 million (Weiss 2005); and ecological risks were insignificant (BBL 2006). Risks to human health were above 1 in 1 million at the SWTs, Domestic Septic System 4, and the EDPs areas (Weiss 2005), but ecological risks were insignificant (BBL 2006).

Potential future groundwater impacts associated with the transport of contaminants retained in soil remaining at the SWTs area, Ra/Sr Treatment Systems, the Dry Wells, and Domestic Septic System 3 and 4 areas were deemed possible based on conservative vadose zone transport modeling.

Following completion of the site-wide risk assessment, the feasibility study report (Weiss 2008), proposed plan (DOE 2008), and ROD were prepared to address the remaining areas with excess cancer risks exceeding 1 in 1 million and areas where contaminants in soil have the potential to impact groundwater quality.

During the first Five-Year Review (DOE 2016), DOE determined that the site remedies were protective, but the vapor intrusion exposure pathway had not been fully evaluated based on evolving standards. To address this gap, DOE conducted a vapor intrusion investigation in 2017 and 2018. The results of this investigation indicated that vapor-forming chemicals in the DOE areas did not present an unacceptable risk under current or potential future land-use scenarios, and no further action was required, and that the remedies were protective (DOE 2018).

Potential site risks were reevaluated during the second Five-Year Review in 2021 (DOE 2021a) using updated toxicity factors and exposure assumptions. Table 2 summarizes the updated risks for the three DOE areas where the excess cancer risk remains above 1 in 1 million. In the second Five-Year Review, DOE determined that the remedies remain protective (DOE 2021a).

1.5 Remediation Goals

Table 3 presents the CERCLA remediation goals for constituents of concern (COCs) that were above background in DOE areas soil and presents human health cancer risks above 1 in 1 million.

Table 4 presents the CERCLA remediation goals for the protection of groundwater, and Table 5 lists additional constituents identified in the ROD to be monitored in groundwater (Weiss 2005).

Table 2. Human Health Risks by Exposure Route for Contaminants in Soil at the DOE Areas

Updated[a] Cancer Risk by Exposure Route									
DOE Area	**Receptor/Constituent**	**Exposure Point Concentration (0–10 feet)[a]**	**Soil Ingestion**	**Soil Dermal Exposure**	**Aboveground Plant Ingestion[b]**	**Belowground Plant Ingestion[b]**	**External Radiation**	**Dust Inhalation**	**Total Cancer Risk**
Domestic Septic System 4	**Onsite Resident**								
	Benzo[*a*]anthracene	3.8	3×10^{-5}	1×10^{-5}	1×10^{-5}	2×10^{-5}	NA	9×10^{-8}	7×10^{-5}
	Benzo[*a*]pyrene	2.4	5×10^{-5}	2×10^{-5}	1×10^{-5}	2×10^{-5}	NA	2×10^{-9}	9×10^{-5}
	Benzo[*b*]fluoranthene	2.7	2×10^{-5}	7×10^{-6}	8×10^{-6}	1×10^{-5}	NA	2×10^{-10}	5×10^{-5}
	Benzo[*k*]fluoranthene	1.5	1×10^{-5}	4×10^{-6}	3×10^{-6}	4×10^{-6}	NA	1×10^{-10}	2×10^{-5}
	Dibenzo[*a,h*]anthracene	1.1	3×10^{-5}	1×10^{-5}	3×10^{-6}	5×10^{-6}	NA	1×10^{-9}	5×10^{-5}
	Indeno[1,2,3-*cd*]pyrene	0.86	7×10^{-6}	2×10^{-6}	7×10^{-7}	1×10^{-6}	NA	7×10^{-11}	1×10^{-5}
	Total								**3×10^{-4}**
	Onsite Construction Worker								
	Benzo[*a*]pyrene	2.4	3×10^{-7}	5×10^{-7}	NA	NA	NA	9×10^{-9}	**8×10^{-7}**
Eastern Dog Pens	**Onsite Resident**								
	Dieldrin	0.019	4×10^{-7}	1×10^{-7}	3×10^{-7}	6×10^{-7}	NA	2×10^{-11}	1×10^{-6}
	Strontium-90	0.33[c]	2×10^{-8}	NA	1×10^{-6}	NA	6×10^{-8}	2×10^{-12}	1×10^{-6}
	Total								**2×10^{-6}**
Southwest Trenches	**Onsite Resident**								
	Strontium-90	0.94	7×10^{-8}	NA	3×10^{-6}	NA	2×10^{-7}	6×10^{-12}	**3×10^{-6}**

Notes:
Cancer risks presented here are estimated excess lifetime probabilities of contracting cancer from exposure to carcinogenic compounds or radionuclides in soil (1×10^{-6} excess cancer risk is the point of departure for determining remediation goals at CERCLA sites). Source data are from the *Second Five-Year Review Report for the Laboratory for Energy-Related Health Research Federal Facility*, Table F-12 (DOE 2021a). Only exposure pathways for contaminants in soil at the DOE areas are presented here. Exposures to groundwater and surface water contaminants are not included because they will be addressed by the UC Davis Feasibility Study.
Chemical concentrations are expressed in milligrams per kilogram, and radionuclide concentrations are expressed in picocuries per gram.

[a] The 95% upper confidence limit on the mean or maximum sample concentration.
[b] Homegrown produce (for radionuclides, plant ingestion is not subdivided into aboveground and belowground produce).
[c] Exposure point concentration after EDPs area maintenance action.

Abbreviation:
NA = not applicable

Table 3. Remediation Goals for the Protection of Human Health

DOE Area	Receptor/Constituent of Concern	Exposure Point Concentration[a]	Remediation Goal[b]
Domestic Septic System 4	**Onsite Resident**		
	Benzo[*a*]anthracene	3.8	0.2
	Benzo[*a*]pyrene	2.4	0.03
	Benzo[*b*]fluoranthene	2.7	0.4
	Benzo[*k*]fluoranthene	1.5	0.004
	Dibenzo[*a,h*]anthracene	1.1	0.1
	Indeno[1,2,3-*cd*]pyrene	0.86	0.2
	Onsite Construction Worker		
	Benzo[*a*]pyrene	2.4	2
Southwest Trenches	**Onsite Resident**		
	Strontium-90+daughter	0.94	0.3
Eastern Dog Pens	**Onsite Resident**		
	Dieldrin	0.019	0.006
	Strontium-90+daughter	0.33[c]	0.3

Notes:
Chemical concentrations are expressed in milligrams per kilogram, and radionuclide concentrations are expressed in picocuries per gram.
[a] Maximum concentration or 95% upper confidence limit on the mean for soil located between 0 and 10 feet below ground surface.
[b] Remediation goals are based on a risk of 1 in 1 million, determined using one significant figure total cancer risk; all concentrations are based on dry weight of soil sample.
[c] Exposure point concentration after EDPs area maintenance action.

Table 4. Soil Remediation Goals for the Protection of Groundwater

DOE Area	Constituents of Concern in Soil[a]	Maximum Soil Concentration[b]	Background Remediation Goal[c,d]	MCL Remediation Goal[c,e]
Domestic Septic System 3	Formaldehyde	2.2	0.0019	0.0151[g]
	Molybdenum	2.5	<0.26[f]	1.73[i]
	Nitrate as N	106	36[f]	36[f]
Domestic Septic System 4	Selenium	2.0[h]	1.23	35
Dry Wells A–E	Chromium	245	199/125/181[f]	199/125/181[f]
	Hexavalent chromium	1.62	1.3[f]	1.3[f]
	Mercury	5.3	3.94/0.248/0.63[f]	3.94/0.248[n]/0.63[f]
	Molybdenum	1.3	<0.26[f]	2.0[j]
	Silver	53.8	0.55[f]	0.83
	Cesium-137	0.191	0.5	20[j]
	Strontium-90	0.176	0.056[f]	0.28
Radium/Strontium Treatment Systems[m]	Nitrate as N	304	36[f]	36[f]
	Carbon-14	2.41	<0.13[f]	2.34[j,k]
	Radium-226	1.72[l]	0.752[f]	1.9
Southwest Trenches	Nitrate as N	909	36[f]	36[f]
	Carbon-14	5.84	<0.13[f]	0.292[j,k]

Notes:
Chemical concentrations are expressed in milligrams per kilogram, and radionuclide concentrations are expressed in picocuries per gram.

[a] Vadose zone soil contaminant with potential to impact groundwater.
[b] Maximum level of the specified constituent detected in soil samples collected from the specified DOE area.
[c] Soil goals updated in 2016 using updated groundwater goals; presented in Appendix F of the *First Five-Year Review for the Laboratory for Energy-Related Health Research Federal Facility*, Table F-2 (DOE 2016).
[d] Soil concentration predicted by transport modeling, above which groundwater impacts in excess of site background are possible. The calculated remediation goals are expressed as dry weight.
[e] Soil concentration predicted by transport modeling, above which groundwater impacts above California drinking water MCL may occur, unless noted. The calculated remediation goals are expressed as dry weight.
[f] Soil background concentration was selected as the remediation goal because the calculated remediation goal is below the soil background concentration. Three values presented if soil background is stratified; the first value represents 0 to 4 feet below ground surface, the second value represents deeper than 4 feet below ground surface, and the third value is consolidated (all depths). Calculated remediation goals for these constituents are presented in the *Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment (Part B Risk Characterization for DOE Areas)* (Weiss 2005).
[g] Based on the CDPH level of 100 micrograms per liter (*California Health and Safety Code* 116455 [CHSC 116455]).
[h] Residual selenium soil concentrations exceeded soil background in 23% of the samples collected, and modeling suggests that selenium concentrations in the soil are unlikely to impact groundwater at levels that exceed the remediation goals. However, selenium was retained as a COC due to its presence (one result) in a downgradient HSU-1 well at a concentration slightly above groundwater background.
[l] Based on the EPA Region 9 regional screening level for tap water (EPA 2015a).
[j] Based on the 4-millirem-per-year federal MCL for beta particles and photon emitters (EPA 2000).
[k] The different MCL remediation goals for the Ra/Sr Treatment Systems and SWTs areas reflect the observed vertical distribution of contamination in these areas.
[l] The sample containing the maximum ^{226}Ra result in the Ra/Sr Treatment Systems area was re-collected and re-analyzed. The reported maximum value is the average of the initial result (1.81 picocuries per gram) and re-collected sample result (1.63 picocuries per gram).
[m] The Ra/Sr Treatment Systems area is inclusive of Domestic Septic System 2.
[n] Mercury MCL remediation goal (0.572 milligrams per kilogram) is above the 0 to 4-feet soil background value (0.248 milligrams per kilogram).

Abbreviations:
HSU = hydrostratigraphic unit
MCL = maximum contaminant level

Table 5. Additional Constituents to Be Monitored Due to Potential Impact on Groundwater Quality

Area	Constituents of Potential Concern to Be Monitored
Domestic Septic System 1	Aluminum
Domestic Septic System 3	Aluminum, silver
Domestic Septic System 4	Aluminum, chromium, nickel
Domestic Septic System 5	Aluminum
Domestic Septic System 6	Aluminum
Domestic Septic System 7	None
Dry Wells A–E	None
Radium/Strontium Treatment Systems[a]	Americium-241
Southwest Trenches	Mercury, zinc
Western Dog Pens	None
Eastern Dog Pens	Alpha-chlordane, gamma-chlordane, dieldrin
DOE Disposal Box	None

Note:
[a] The Radium/Strontium Treatment Systems area is inclusive of Domestic Septic System 2.

2.0 Implementation of Land-Use Controls

Land-use controls are physical, administrative, or legal mechanisms used to limit exposure to residual contamination. The CERCLA remedies require the implementation of land-use controls (identified as land-use restrictions in the ROD) in Ra/Sr Treatment Systems, Domestic Septic System 3, Domestic Septic System 4, Dry Wells A–E, EDPs, and SWTs areas (Table 1), as discussed below.

2.1 Areas Subject to Land-Use Restrictions

Figure 3 shows the location of areas subject to land-use restrictions. A professional land surveyor licensed by the California Board for Professional Engineers, Land Surveyors, and Geologists surveyed the boundaries of the DOE areas subject to land-use restrictions, including the potential future remediation support areas, and installed 24 brass monuments to physically delineate the areas (Figure 3).

2.2 Covenant to Restrict Use of the Property

An environmental Covenant (Covenant) between the Regents of the University of California and DTSC, with EPA identified as a third-party beneficiary, was recorded by Solano County in July 2014 (DTSC 2014) (Appendix B). The Covenant identifies the legal descriptions of the areas subject to land-use restrictions and sets forth the environmental restrictions required by the ROD that remain DOE's responsibility under CERCLA and the MOA. As such, all requirements in the land-use Covenant "owner" responsibilities are ultimately DOE's. Thus, for the purposes of this plan, DOE is identified as being responsible for tasks and duties assigned to the "Owner" in the Covenant.

The Covenant includes the following requirements:

- Prohibited uses. Residential use, use for daycare for children, and cultivation of crops for human consumption are prohibited in the Domestic Septic System 4 area (Figure 3).
- Soil management. An SMP (DOE 2019), approved by EPA and DTSC, is required to manage residual contaminants in soil at the Ra/Sr Treatment Systems, Domestic Septic System 3, Domestic Septic System 4, Dry Wells A–E, EDPs, and SWTs areas (Figure 3). The SMP was updated to include requirements for vegetation management in 2019. As recommended in the second Five-Year Review (DOE 2021a), the SMP is being revised to identify vegetation that is subject to routine maintenance (e.g., pruning) by UC Davis grounds staff and to develop procedures and protocols to properly manage the cuttings. The SMP update is scheduled for completion in mid- to late fiscal year 2022.
- Noninterference with groundwater monitoring wells. Site use and development activities need to allow continued access and functionality of ROD-required groundwater monitoring network (Figure 3). Any changes to the monitoring network need to be approved in writing by EPA and DTSC.
- Access for DTSC and EPA. EPA and DTSC shall have reasonable right of entry and access to the property for periodic inspections, monitoring, and other activities consistent with the purpose of the Covenant.

- Access for implementing operation and maintenance. DOE and other parties responsible for the operation and maintenance activities shall have reasonable right of entry and access to the property to conduct these activities.
- Inspections and reporting. DOE is required to conduct an annual inspection of the property to verify compliance with the requirements and restrictions contained in the Covenant, with a report submitted to DTSC and EPA by January 15 of each year. The report must document all soil-disturbing activities that occurred and wastes that were generated during the year and the operational status of the monitoring well network and land-use-control markers. The 2020 inspection report was submitted on January 6, 2021, and the 2021 report will be submitted on or before January 15, 2022. If violations of Covenant requirements are noted, the annual inspection report must detail the steps taken to return to compliance. If DOE identifies any violations of the Covenant during the annual inspections or at any other time, DOE must within 10 days of identifying the violation determine the identity of the party in violation, send a letter advising the party of the violation of the Covenant, and demand that the violation ceases immediately. Additionally, copies of any correspondence related to the violation of the Covenant shall be sent to DTSC and EPA within 10 days of their original transmission.
- Notices. In accordance with Section 7.03 of the recorded covenant, DOE is required to notify in writing the UC Davis environmental manager, the Regents of the University of California, Real Estate Services of UC Davis, DTSC, and EPA of any communication dealing with the Covenant.

In accordance with the ROD, the Covenant will be maintained until DOE, DTSC, and EPA agree that the land-use restrictions are no longer required to protect human health and the environment.

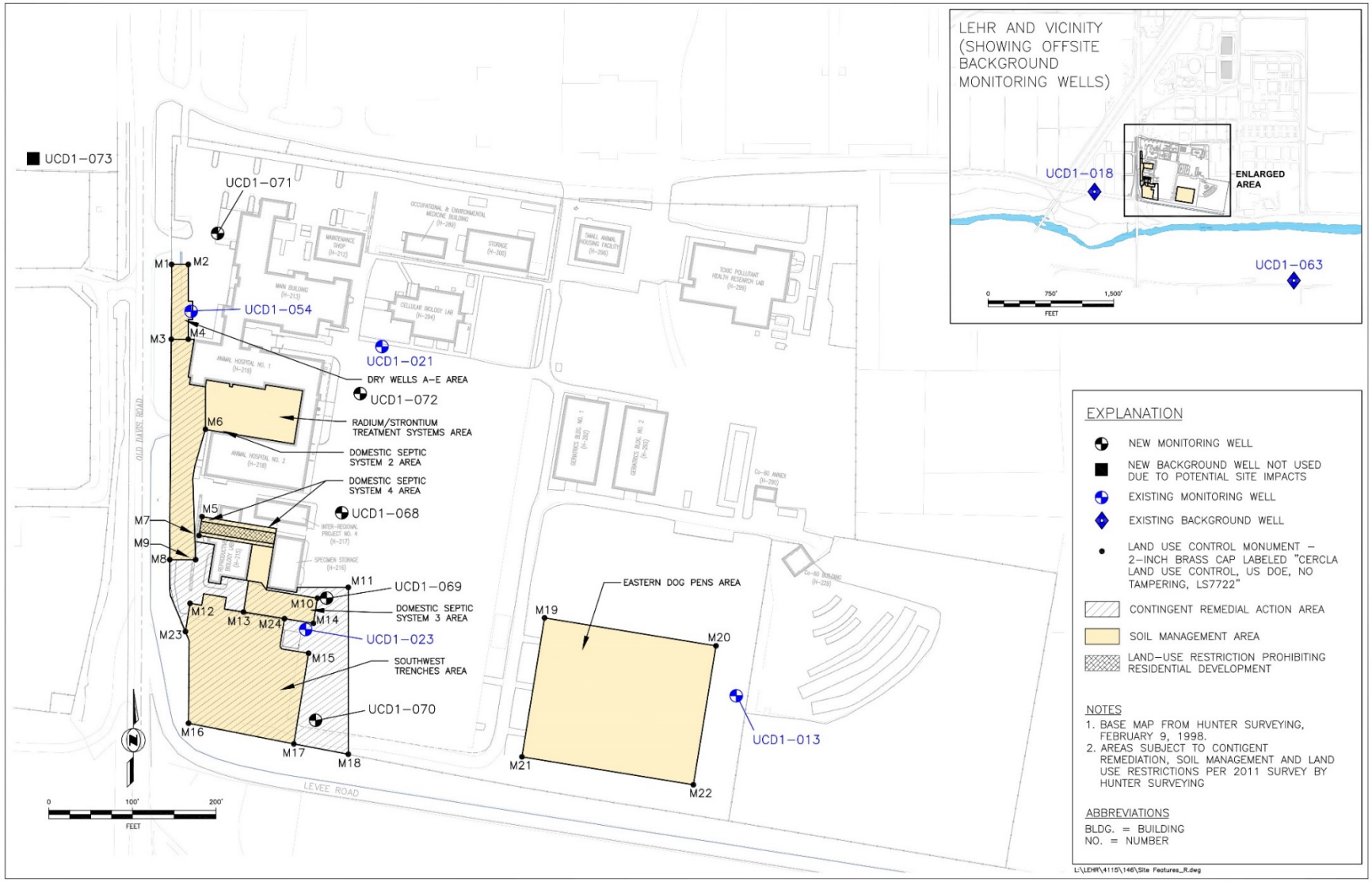

Figure 3. DOE Areas of the LEHR Federal Facility Subject to Land-Use Controls and Locations of DOE Groundwater Monitoring Wells

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3.0 Long-Term Groundwater Monitoring

This section presents the purpose of the long-term groundwater monitoring remedy, its compliance monitoring requirements (e.g., frequency, analytes, analytical methods, detection limits), and the process for evaluating groundwater monitoring data. In accordance with the ROD, groundwater monitoring will continue until it can be shown that the COCs in soil no longer threaten water quality.

As discussed in Section 2.0, residual concentrations of contaminants in soil have the potential to impact groundwater at the SWTs area, Ra/Sr Treatment Systems, Domestic Septic System 3, Domestic Septic System 4, and the Dry Wells areas. Long-term groundwater monitoring was implemented in 2011 to monitor for these impacts at nine monitoring wells (UCD1-013, UCD1-021, UCD1-023, UCD1-054, and UCD1-068 through UCD1-072). Background samples are collected from wells UCD1-018 and UCD1-063 as needed (Figure 3).

In 2016 and 2017, DOE collected additional background samples, but DOE and EPA did not agree on a methodology to reevaluate groundwater background conditions using these data. There was no immediate need to reestablish background values for the groundwater monitoring program, so DOE and EPA decided to defer the background data evaluation (Weiss 2019).

All samples collected between 2011 and 2020 were collected and analyzed according to the requirements of the *Quality Assurance Project Plan for the U.S. Department of Energy Laboratory for Energy-Related Health Research, University of California, Davis* (DOE 2012), hereafter referred to as the Quality Assurance Project Plan (QAPP), which are approved for groundwater monitoring by the regulatory agencies. In March 2021, an update to the QAPP was finalized (DOE 2021b) and approved by EPA, DTSC and CVRWQCB. Beginning in April 2021, groundwater program sample collection and analysis was performed according to the updated procedures and specifications. The results from the prior year sampling and a groundwater sampling plan for the next year are published in the annual water monitoring report for the site (Weiss 2021). The 2021 sampling plan is summarized in Table 6. Sample collection procedures and analytical requirements are provided in Appendix C.

Analytical laboratories certified through the California Environmental Laboratory Accreditation Program are required by the QAPP. Certified analytical laboratories currently authorized to conduct analyses for samples collected by DOE under the QAPP are GEL Laboratories in Charleston, South Carolina, for radionuclides; TestAmerica Laboratories Inc. in North Canton, Ohio, for formaldehyde; and Eurofins Calscience Inc. in Garden Grove, California, for all other analyses.

If groundwater COCs are confirmed at concentrations significantly above their established comparison criteria (baseline or background) (Weiss 2014), remedial options will be evaluated by DOE using the decision process shown on Figure 4 (DOE 2016). To date, no significant exceedances of established comparison criteria have been observed in DOE groundwater monitoring wells.

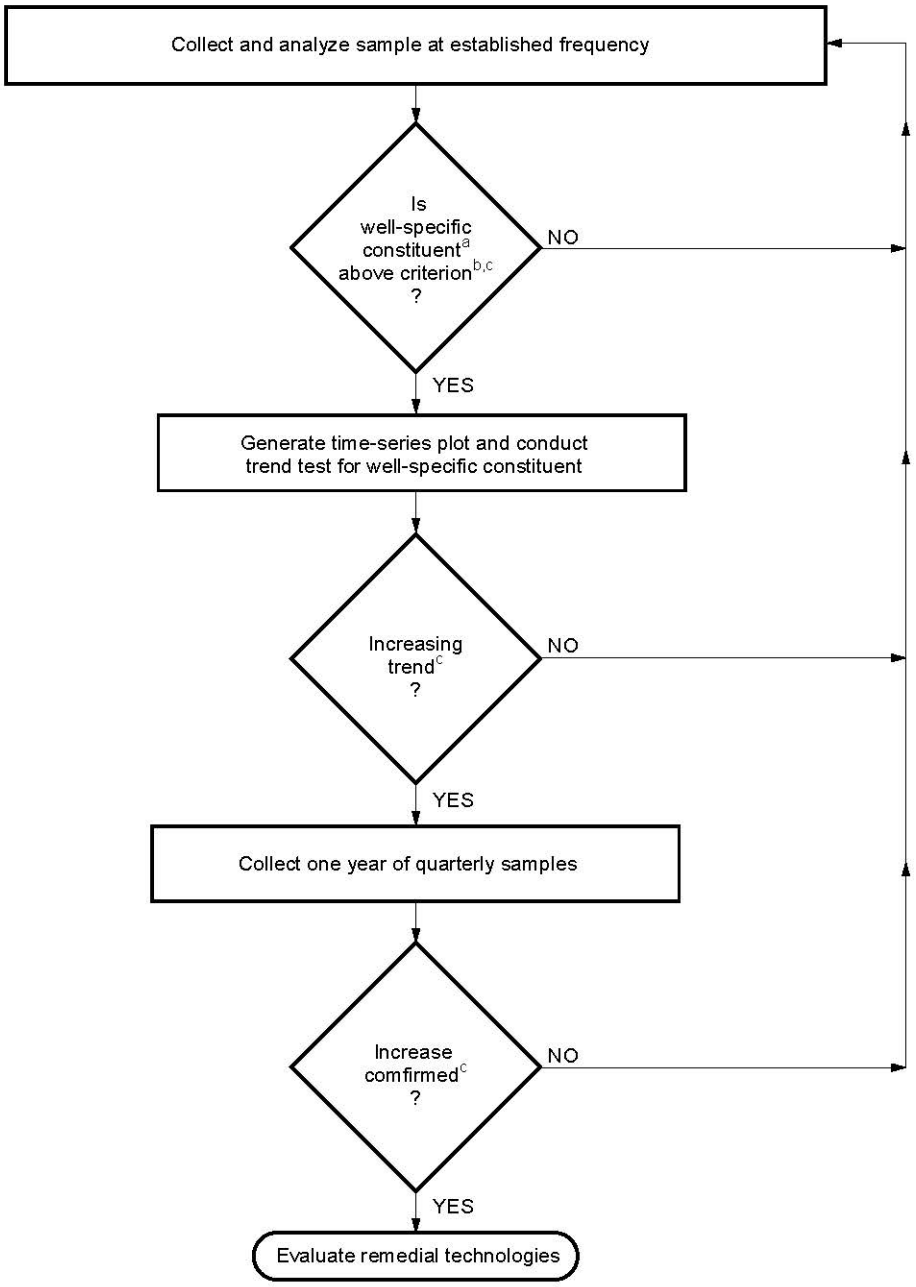
Table 6. 2021 DOE Areas Groundwater Sampling Plan

Well Name	1,1-Dichloroethane	Aluminum	Americium-241	Benzene	Beta, Gross	Carbon-14	Cesium-137	Chlordane	Chloroform	Chromium, Hexavalent	Chromium, Total	Dieldrin	Formaldehyde	Iron	Manganese	Mercury	Molybdenum	Nickel	Nitrate (as Nitrogen)	Radium-226	Selenium	Silver	Strontium-90	Uranium-238	Zinc
UCD1-013								A				A													
UCD1-021																			A						
UCD1-023						A																			
UCD1-054																									
UCD1-068										A	A										A				
UCD1-069		A				Q[a]																		A	
UCD1-070						A																			
UCD1-071					A					Q[a]	Q[a]														
UCD1-072					A				A	A	A								Q[a]					A	

Note:
Annual "A" sampling conducted in 2021.
[a] Quarterly samples were collected in the second and fourth quarters of 2020, and are planned in the second and fourth quarters of 2021.

Monitoring-only constituent
New well constituent
COC

Abbreviations:
A = annual
Q = quarterly



Notes:

a. Inclusive of constituents of concern, monitoring-only constituents, and new well constituents.

b. Criterion is background if baseline is below background; otherwise criterion is baseline. Background and baseline were established in 2012 (Weiss 2014).

c. The following may be conducted to confirm the well-specific constituent is above the criterion and/or the trend is increasing:

- Data uncertainty evaluation
- Resampling
- Reevaluation of background (which may include sampling background wells)

Figure 4. Groundwater Monitoring Decision Process

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4.0 Implementation of Contingent Groundwater Remediation

This section presents the purpose of contingent remediation and summarizes its implementation.

As discussed in Section 3.0, if groundwater monitoring indicates that COCs are migrating from soil in DOE areas to groundwater and are impacting or may impact groundwater quality, DOE will then evaluate options for remediation. Remedial cleanup technologies will be evaluated in accordance with CERCLA, applicable or relevant and appropriate requirements, and the corrective action requirements of Title 27 *Code of California Regulations* (27 CCR). If a cleanup technology is selected, it will be designed, permitted, constructed, inspected, started, tested, operated, and maintained according to the applicable planning documents, codes, and regulations.

To date, no significant soil-to-groundwater impacts have been identified in the DOE areas and therefore groundwater remediation has not been required.

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5.0 Project Organization

LM is responsible for implementing the remedies selected in the ROD. Several other organizations play a role in the remediation and long-term surveillance and maintenance of the LEHR site according to the FFA and MOA. These agreements and key project positions are described below.

5.1 Federal Facility Agreement

The parties to the FFA are DOE, EPA, DTSC, CVRWQCB, and CDPH. DOE is the lead agency for the cleanup and must comply with all applicable CERCLA requirements. EPA supports DOE with applicable EPA programs and regulations relating to the cleanup, and other agencies provide active support with state programs and regulations. As stated above, CDPH opted to discontinue active participation in the project in 2016 (Weiss 2016). Along with UC Davis, active parties to the agreement participate in project planning and prioritization, attend regular meetings, provide general regulatory assistance, and exchange data that have been collected.

5.2 Memorandum of Agreement

DOE and the Regents of the University of California entered into an MOA for environmental restoration and decontamination on March 13, 1990 (amended February 17, 1993; November 30, 1993; and June 18, 1997; and superseded on July 8, 2009). The 2009 MOA outlines the current roles and responsibilities of the MOA parties regarding the investigation and remediation of the LEHR site.

In accordance with the 2009 MOA (Appendix A), the Regents of the University of California have agreed to support LTS&M Plan activities through an established grant funding process, including:

- Training staff and emergency response personnel on SMP requirements.
- Implementing a soil disturbance permit process according to the SMP.
- Providing site access to DOE and the regulatory agencies.
- Conducting groundwater and storm water monitoring and reporting.

5.3 Key Personnel

Kathleen Whysner of LM manages CERCLA compliance activities including implementation of the remedies at LEHR.

The Legacy Management Support (LMS) contractor supports DOE in the oversight of all site operations, reporting, land-use control inspections, and project management.

UC Davis supports DOE in the performance of soil management, site access, sampling, community interaction, and reporting activities covered under the grant funding process.

Weiss Associates supports DOE as an LMS subcontractor and supports UC Davis under a separate contract with UC Davis.

Individuals holding key positions for the LMS contractor responsibilities are as follows:

- **Project manager:** Michael Butherus
- **Contracts administrator:** Julie Dorris
- **Project health and safety manager:** Nikole Cale
- **Project environmental and regulatory compliance manager:** Cameron Garcia
- **Project quality assurance manager:** Raymond Keeler
- **Project records administrator:** Shawn Hawkins

Individuals holding key positions for UC Davis responsibilities are as follows:

- **Project manager:** Chris Wright
- **Contracts administrator:** Katarina Mitchel
- **Project health and safety manager:** Rachel Lauesen
- **Project environmental and regulatory compliance manager:** Chris Wright
- **Project quality assurance manager:** Rachel Lauesen
- **Project records administrator:** Rachel Lauesen

Individuals holding key positions for Weiss responsibilities are as follows:

- **Project manager:** Bob Devany
- **Task leader:** Tim Utterback
- **Contracts administrator:** Mark Eley
- **Project health and safety manager:** Agata Sulczynski
- **Database manager:** Jim Martin
- **Project chemist:** Brian Bandy
- **Project quality assurance manager:** Joyce Adams
- **Project records manager:** Michele Martinez

5.4 Documents for Public Review and Comment

A formal public involvement process for decision documents is an important part of the CERCLA process and is in place to ensure that stakeholders have the opportunity to comment on cleanup and closure decisions at the site. DOE releases a draft version of all decision documents for regulatory review and comment. After regulators' comments have been addressed, the document is released for public comment and can be viewed at the DOE public access website: https://www.lm.doe.gov/cercla/SiteSelector.aspx.

5.5 Records and Data Management

All records created by LM are managed in accordance with Title 36 *Code of Federal Regulations* Sections 1220–1236 (36 CFR 1220–1236), "Federal Records," and the FFA for the site.

DOE shall maintain active records as required by the agency records management program. Active records contain information essential to the long-term care and custody of the site pursuant to applicable laws and regulations. In general, these records include historical records and reports documenting historical site operations, site characterization reports, remedial action plans, National Environmental Policy Act documents, engineering design and construction documents, as-built drawings, results of groundwater monitoring, and annual inspection reports.

The LM Business Center at Morgantown, West Virginia, is the designated facility for archived LEHR federal facility records. DOE shall retain custody of the records sent to the records facility and is responsible for their destruction at the end of their approved retention periods. As stated in the FFA:

- *DOE shall preserve, during the pendency of this agreement and for a minimum of (10) years after its termination, all records and documents contained in the CERCLA Administrative Record and any additional records and documents retained in the ordinary course of business which relate to the actions carried out pursuant to this agreement.*
- *After this ten (10) year period, each party to this agreement shall notify the other parties at least forty-five (45) days prior to destruction of any such documents.*
- *Upon request by any party to this agreement, the requested party shall make available such records or copies of any such records unless withholding is authorized and determined appropriate by law.*

All records with permanent value are transferred to LM.

Site environmental sampling data have been managed in a relational database by Weiss Associates since 1996. From October 2020 to January 2021, LM and Weiss Associates developed a data transfer protocol (DOE 2021c) for the transfer of these data to LM's complex-wide environmental database for archival purposes. It is expected that new site data will be transferred to the LM database on an annual basis moving forward.

On March 30, 2021, Weiss transferred the following files to LM:

- Lehrmain.accdb – Microsoft Access database containing historical analytical data for soil, groundwater, and waste samples collected on behalf of DOE at the LEHR site.
- Air.accdb – Microsoft Access database containing historical analytical data for air monitoring samples collected on behalf of DOE at the LEHR site.
- LEHR_EQuIS_Weiss_20210317.mdf – Structured query language (SQL) server copy of currently maintained soil, groundwater, and waste sample data collected on behalf of DOE at the LEHR site and stored in the Weiss active Environmental Quality Information System (EQuIS) database.
- LEHR_EQuIS_Weiss_20210317_log.mdf – Transaction log file to be used if recovery of the SQL server copy becomes necessary.

- Well Construction Details_DOE Program.xlsx – Tabulated construction details for wells used in the DOE areas groundwater monitoring program at the LEHR site.
- Weiss Special-Case Duplicate Memorandum Rev 0.pdf – Memorandum documenting special-case duplicate records provided in the Weiss EQuIS database transfer copy in accordance with Section 5.4 of the Data Transfer Protocol (DOE 2021c).

Communication in support of this database transfer is ongoing and the archival data transfer is expected to be completed by March 30, 2022.

6.0 Quality Assurance

This section provides a brief summary of key project quality-related requirements included in the QAPP, standard quality procedures (SQPs), and the *Remedial Design/Remedial Action Work Plan for the Former Laboratory for Energy-Related Health Research Federal Facility, University of California, Davis* (DOE 2010), hereafter referred to as the Remedial Design/Remedial Action Work Plan (RD/RAWP). The QAPP sections referenced below apply to the approved QAPP issued in 2021 and should be reviewed and implemented as appropriate during planning and implementation of DOE activities at the site.

6.1 Data Quality Objectives

Data quality objectives for the remedial action activities are documented in the RD/RAWP. Revisions or updates to the data quality objectives require LEHR Project Team agreement.

6.2 Roles and Responsibilities

The roles and responsibilities of key personnel are described in Section 2.2 of the QAPP, and personnel currently filling key positions are presented in Section 5.3 of this LTS&M Plan. Project personnel can delegate the execution of, but not the responsibility for, their quality-affecting tasks to other qualified project personnel. Key personnel can also delegate a substantial subset of their functions to a qualified deputy who will assume full responsibility for the delegated duties. In either case, delegated duties and responsibilities shall be clearly defined and documented in writing.

6.3 Personnel Training and Qualification

Before the start of any activities covered by this LTS&M Plan, personnel training and qualification will be conducted and evaluated in accordance with Section 5 of the QAPP and SQP 3.2, “Indoctrination and Training” (Appendix B of the QAPP).

6.4 Field Documentation and Records Management

All quality-affecting records generated during activities covered by this LTS&M Plan will be managed in accordance with Sections 4 and 8.9.2.4 of the QAPP; SQP 4.1, “Document Control,” and SQP 4.2, “Records Management” (Appendix B of the QAPP). Quality-affecting documents include personal field logs, calibration records, monitoring data, inspection checklists, sampling documentation, and procurement records.

6.5 Test Control

Analytical laboratory testing will be performed and documented in accordance with Section 8 of the QAPP.

6.6 Design Control

Project design calculations and drawings will be developed, reviewed, documented, and filed in accordance with Section 9 of the QAPP.

6.7 Calibration and Maintenance of Measuring and Test Equipment

Measuring and test equipment will be calibrated and maintained in accordance with Sections 8.4 and 8.5 of the QAPP, standard operating procedure (SOP) 1.3, "Field Measurements, Maintenance, and Calibration of Instruments," and SQP 8.1, "Calibration and Maintenance of Measuring and Test Equipment" (Appendix B of the QAPP). Measuring and test equipment shall be calibrated and maintained according to manufacturer specifications or as specified by project documents, procedures, or guidelines. Calibration data shall be recorded each day calibrations are performed. Data for multiple instruments may be recorded on a single form or on forms specific to the instrument. Measuring and test equipment will not be used in the field if results of calibrations are not within the tolerances specified by the manufacturer or by project documents, procedures, or guidelines.

6.8 Field Sampling

Field sampling will conform to the requirements of Section 3.0 of this LTS&M Plan, Section 8.1.3 of the QAPP, and the sample collection procedures specified in Appendix C.

6.9 Procurement

All material, equipment, and subcontractor services will be procured and received according to the requirements of Section 8.6 of the QAPP and SQP 7.2, "Receipt Inspection" (Appendix B of the QAPP).

6.10 Data Quality Assessment

Groundwater monitoring data will be assessed as specified in Section 8.9 of the QAPP and Section 7.10 of the RD/RAWP. Data quality assessment begins with data verification and validation as specified in SOP 21.2, "Data Verification" and SOP 21.1, "Data Validation" (Appendix B of the QAPP). Sample login and analytical results reports generated by the laboratory are verified and any errors found are communicated to the laboratory for correction. Validation qualifiers are assigned to sample results when quality control parameters do not meet QAPP specifications. If qualified data are used as the basis for project decisions, these data are evaluated to determine the likelihood of decision errors. The level of confidence in project decisions is then documented and used as a basis for further action. Data quality assessment associated with soil management is addressed separately in the SMP.

6.11 Inspections, Audits, and Surveillances

Inspections, audits, and surveillances will be conducted according to Sections 12 and 15 of the QAPP. Periodic inspections and audits will be conducted by trained quality assurance personnel. These inspections and audits will include observation of field activities, a review of

project documentation, or both. All observations, findings, and supporting documentation that result from the inspections and audits will be summarized in the appropriate report format and submitted to the project file.

6.12 Nonconformance Control and Corrective Action

Nonconformances and corrective actions will be addressed according to Section 13 of the QAPP; SQP 10.1, "Nonconformance Control"; SQP 10.2, "Quality Corrective Action"; and SQP 10.3, "Stop Work Order" (Appendix B of the QAPP).

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7.0 References

27 CCR. "Environmental Protection," *California Code of Regulations*.

36 CFR 1220–1236. "Federal Records," *Code of Federal Regulations*.

BBL (Blasland, Bouck, and Lee), 2006. *Final Site-Wide Ecological Risk Assessment, Laboratory for Energy-Related Health Research/South Campus Disposal Site*, University of California, Davis, August.

CHSC 116455. Article 5, "Public Notification," 116455, *California Health and Safety Code.*

DOC (U.S. Department of Commerce), 1963. *Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure*, U.S. Department of Commerce National Bureau of Standards Handbook 69, September.

DOE (U.S. Department of Energy), 1997. *The Procedures Manual of the Environmental Measurements Laboratory,* HASL 300, 28th edition, Environmental Measurements Laboratory, New York, New York, February.

DOE (U.S. Department of Energy), 2008. *Proposed Plan for the Department of Energy Areas at the Former Laboratory for Energy-Related Health Research, at the University of California, Davis,* October.

DOE (U.S. Department of Energy), 2009a. *Memorandum of Agreement Between the United States Department of Energy and the Regents of the University of California Regarding the Investigation, Remediation, Long-Term Surveillance, Maintenance, and Contingent Remediation of the Laboratory for Energy-Related Health Research at the University of California, Davis*, July 8.

DOE (U.S. Department of Energy), 2009b. *Record of Decision for DOE Areas at the Laboratory for Energy-Related Health Research, University of California, Davis,* LMS/LEH/S05069, Office of Legacy Management, September.

DOE (U.S. Department of Energy), 2010. *Remedial Design/Remedial Action Work Plan for the Former Laboratory for Energy-Related Health Research Federal Facility, University of California, Davis*, LMS/LEH/S05822, Office of Legacy Management, November.

DOE (U.S. Department of Energy), 2012. *Quality Assurance Project Plan for the U.S. Department of Energy Laboratory for Energy-Related Health Research, University of California, Davis,* LMS/LEH/S06784, Rev. 0, January.

DOE (U.S. Department of Energy), 2016. *First Five-Year Review for the Laboratory for Energy-Related Health Research Federal Facility*, LMS/LEH/S13284, Rev. 0, University of California, Davis, September.

DOE (U.S. Department of Energy), 2018. *Addendum to Laboratory for Energy-Related Health Research Federal Facility, University of California at Davis, Five-Year Review Report, dated September 15, 2016*, LMS/LEH/S20097, July.

DOE (U.S. Department of Energy), 2019. *Soil Management Plan, Former Laboratory for Energy-Related Health Research Federal Facility, University of California-Davis*, LMS/LEH/S24029, August.

DOE (U.S. Department of Energy), 2021a. *Second Five-Year Review Report, Laboratory for Energy-Related Health Research Federal Facility, University of California, Davis*, LMS/LEH/S30753, June.

DOE (U.S. Department of Energy), 2021b. *Quality Assurance Project Plan for the U.S. Department of Energy Laboratory for Energy-Related Health Research Federal Facility, University of California, Davis,* LMS/LEH/S06784-1.0, March.

DOE (U.S. Department of Energy), 2021c. *Data Transfer Protocol for the Laboratory for Energy-Related Health Research Federal Facility, University of California, Davis*, LMS/LEH/S32625, January.

DTSC (California Department of Toxic Substances Control), 2014. *Covenant to Restrict Use of Property, Environmental Restriction (Re: Portions of County of Solano Assessor's Parcel No. 110-05-04 UC Davis, Laboratory for Energy-related Health Research/Old Campus Landfill (LEHR/OCL) Superfund Site, Site Code 100424),* Solano County Recorder's Office Document Number 201400051822, July 11.

EPA (U.S. Environmental Protection Agency), 1980. *Prescribed Procedures for Measurement of Radioactivity in Drinking Water*, EPA Method 901.1, Cincinnati, Ohio, August.

EPA (U.S. Environmental Protection Agency), 1993. *Determination of Inorganic Anions by Ion Chromatography*, Rev. 2.1, Method 300.0, Cincinnati, Ohio, August.

EPA (U.S. Environmental Protection Agency), 1996. *Ground Water Issue, Low-Flow (Minimal Drawdown) Ground Water Sampling Procedures*, EPA/540/S-95/504, April.

EPA (U.S. Environmental Protection Agency), 2000. *Soil Screening Guidance for Radionuclides: User's Guide*, EPA/540-R-00-007, October.

EPA (U.S. Environmental Protection Agency), 2015a. *Drinking Water Contaminants, Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals*, accessed September 8, 2017. https://water.epa.gov/drink/contaminants/secondarystandards.cfm#tabletop.

EPA (U.S. Environmental Protection Agency), 2015b. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,* EPA publication SW-846, Third Edition, Final Updates I–V.

EPA (U.S. Environmental Protection Agency), California Department of Toxic Substances Control (DTSC), Central Valley Regional Water Quality Control Board (CVRWQCB), California Department of Health Services (DHS), and DOE, 1999. Federal Facility Agreement under CERCLA Section 120, Administrative Docket Number: 99 17, In the Matter of: The U.S. Department of Energy Laboratory for Energy related Health Research.

IT Corp, 1997. *DOE Disposal Box Closure Report, Laboratory for Energy-Related Health Research (LEHR), University of California at Davis,* March.

Weiss (Weiss Associates), 2001a. *Final Radium/Strontium Treatment Systems Area Removal Action Confirmation Report for the Laboratory for Energy-Related Health Research, University of California, Davis*, September 14.

Weiss (Weiss Associates), 2001b. *Final Southwest Trenches Area 1998 Removal Action Confirmation Report for the Laboratory for Energy-Related Health Research, University of California, Davis*, June 13.

Weiss (Weiss Associates), 2002. *Final Western Dog Pens Area Removal Action Confirmation Report for the Laboratory for Energy-Related Health Research, University of California, Davis*, October 11.

Weiss (Weiss Associates), 2003a. *DOE Areas Remedial Investigation Report for the Laboratory for Energy Related Health Research, University of California, Davis*, Rev. 0, September.

Weiss (Weiss Associates), 2003b, *Final Domestic Septic Systems 3 and 6 Removal Actions Confirmation Report for the Laboratory for Energy Related Health Research, University of California, Davis*, March 28.

Weiss (Weiss Associates), 2005. *Site-Wide Risk Assessment, Volume I: Human Health Risk Assessment (Part B, Risk Characterization for DOE Areas)*, Rev. 0, University of California, Davis, September 30.

Weiss (Weiss Associates), 2008. *Final DOE Areas Feasibility Study for the Laboratory for Energy-Related Health Research, University of California, Davis*, March 7.

Weiss (Weiss Associates), 2014. *Final 2012 Comprehensive Annual Water Monitoring Report for the Laboratory for Energy-Related Health Research/Old Campus Landfill Superfund Site*, *University of California, Davis*, February 6.

Weiss (Weiss Associates), 2016. *LEHR Team Meeting (Teleconference/Web) Summary, Draft,* January 28, 2016 – 10:00 a.m. to 12:30 p.m., recorded by Mary Stallard, Laboratory for Energy-Related Health Research/Old Campus Landfill Site, University of California, Davis, Environmental Restoration Program.

Weiss (Weiss Associates), 2019. *LEHR Project Team Meeting Summary, Laboratory for Energy-Related Health Research/Old Campus Landfill Site (LEHR/OCL)*, *University of California, Davis*, Environmental Restoration Program, Draft, recorded by Jesse Crews, October 24.

Weiss (Weiss Associates), 2021. *2020 Annual Water Monitoring Report for the Laboratory for Energy-Related Health Research/Old Campus Landfill Superfund Site*, *University of California, Davis*, May 12, Rev. 0.

Appendix A

Memorandum of Agreement

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MEMORANDUM OF AGREEMENT BETWEEN THE UNITED STATES DEPARTMENT OF ENERGY AND THE REGENTS OF THE UNIVERSITY OF CALIFORNIA REGARDING THE INVESTIGATION, REMEDIATION, LONG-TERM SURVEILLANCE, MAINTENANCE, AND CONTINGENT REMEDIATION OF THE LABORATORY FOR ENERGY-RELATED HEALTH RESEARCH AT THE UNIVERSITY OF CALIFORNIA, DAVIS

INTRODUCTION

Whereas, the United States Department of Energy ("DOE") and The Regents of the University of California ("the University") (referred to collectively as "the Parties") entered into Contract DE-AC03-76SF00472 ("the Contract") for the operation of the Laboratory for Energy-Related Health Research ("LEHR"); and

Whereas, the research at LEHR was initially performed under Project Agreement Nos. 4 and 6 of Contract No. AT(l1-1)-10, which was consolidated under Contract No. AT(04-3)-472 (June 29, 1965), which was thereafter redesignated Contract No. E(04-3)-472 by Contract Modification 32 (June 26, 1975), which was thereafter redesignated Contract EY-76-C-03-0472 by Contract Modification 43 (January 10, 1977), which was thereafter redesignated Contract DE-AM03-76SF00472 by Contract Modification No. A057 (April 18, 1979), and which was finally redesignated Contract DE-AC03-76SF00472 by Contract Modification No. A095 (August 9, 1984); and

Whereas, the University is the owner of the land upon which the LEHR Facility is located and gave DOE the right to occupy the land and to build improvements thereon in an Occupancy Agreement dated June 29, 1965 ("Occupancy Agreement"); and

Whereas, the Parties entered into a Memorandum of Agreement ("MOA") dated August 29, 1988 (amended on September 29, 1989), which outlined the University's use of the

buildings, structures, facilities, and other improvements owned by DOE ("the DOE Improvements") at the LEHR Facility under the Occupancy Agreement; and

Whereas, the Parties entered into an MOA for environmental restoration and decontamination dated March 13, 1990 (amended on February 17, 1993, and again on November 30, 1993, and again on June 18, 1997, referred to collectively as the "Prior MOA"), which outlined the roles and responsibilities of the Parties regarding the investigation and remediation of the LEHR Facility and other areas; and

Whereas, DOE has investigated the LEHR Facility, the University Disposal Areas, University-Affected Groundwater and DOE-Affected Groundwater (as defined in Article I.C), and portions of the Adjacent Areas, and has begun remediating portions of the LEHR Facility; and

Whereas, the University has investigated the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and portions of the Adjacent Areas, and has begun remediating portions of the University Disposal Areas and University-Affected Groundwater and is continuing to investigate some of these areas; and

Whereas, the Parties wish to replace the Prior MOA with a new MOA ("Agreement") that establishes a new agreement between the Parties regarding the investigation, remediation, long-term surveillance and maintenance, and contingent remediation ("IR & LTSMCR") of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, and DOE-Affected Groundwater, as well as future LEHR Facility redevelopment by the University.

Now, therefore, the Parties agree as follows:

ARTICLE I − PURPOSE AND SCOPE

A. The purpose of this Agreement is to allocate between the Parties in an equitable and efficient manner activities necessary to perform future IR & LTSMCR consistent with each Party's Record of Decision ("ROD") for the LEHR Facility, the University Disposal

Areas, University-Affected Groundwater, and DOE-Affected Groundwater, and to provide access to DOE to complete IR & LTSMCR activities as required pursuant to the DOE ROD, and to provide the means to integrate DOE's IR & LTSMCR activities with future University of California, Davis ("UC Davis"), remediation, site maintenance, and redevelopment projects.

B. The University and DOE intend this Agreement to be a settlement of their responsibilities and liabilities to each other for the implementation of the IR & LTSMCR of the LEHR Facility. Neither the fact of execution of this Agreement nor any of the terms of this Agreement is or shall be construed as an admission of liability or fact by the University or DOE.

C. The following definitions apply in this Agreement:

1. The term "LEHR Facility" means the following areas within the designated boundary shown in Figure 1: Maintenance Shop (H-212); Main Building (H-213); the location of the former Imhoff Building (H-214); Reproductive Biology Laboratory (H-215); Specimen Storage (H-216); Inter-regional Project No. 4 (H-217); Animal Hospital No. 2 (H-218); Animal Hospital No. 1 (H-219); Co-60 Building (H-229); Occupational and Environmental Medicine Building (H-289); Co-60 Annex (H-290); Geriatrics Building No. 1 (H-292); Geriatrics Building No. 2 (H-293); Cellular Biology Laboratory (H-294); Small Animal Housing (H-296); Toxic Pollutant Health Research Laboratory (H-299); Storage Space (H-300); the cobalt-60 irradiation field; the southwest trenches; the strontium-90 and radium-226 leach fields and the radium-226 waste tanks; the dog pens and associated soils and gravel; the seven septic tanks; the Imhoff storage tanks; and the DOE disposal box.

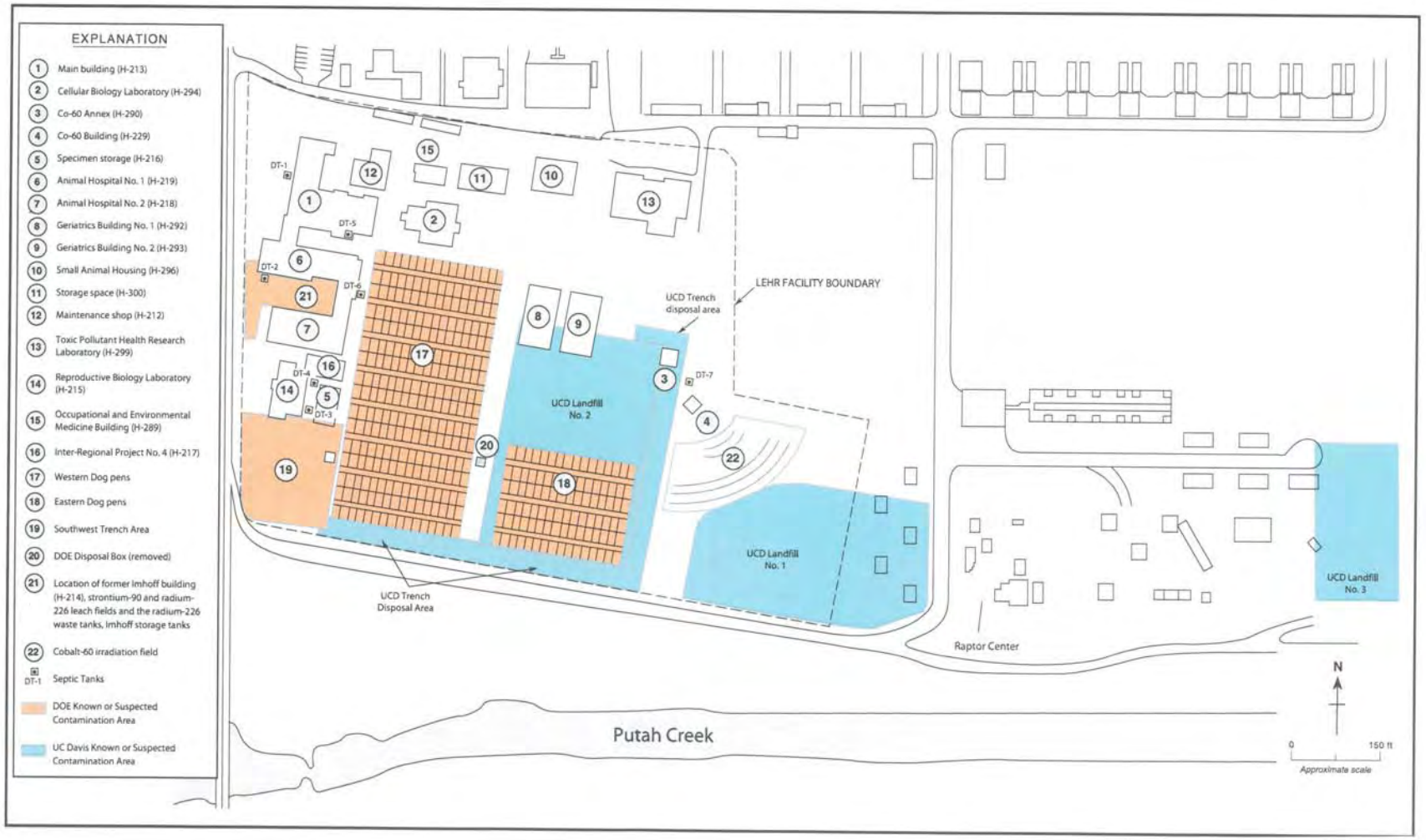

Figure 1. LEHR Facility/Old Campus Landfill, UC Davis, California

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2. The term “University Disposal Areas” means the following areas shown in Figure 1: University landfill cells beneath the LEHR Facility; Landfills 1, 2 (exclusive of dog pens), and 3; the 49 waste burial holes; and the UC Davis eastern and southern disposal trenches. The Parties agree that the areas specifically listed above as “University Disposal Areas” are not part of the LEHR Facility for purposes of this Agreement even though some of them are partially or entirely within or beneath the designated boundary shown in Figure 1.

3. The term “DOE-Affected Groundwater” means groundwater containing contaminants released from the LEHR Facility as a result of DOE-funded activities. “DOE-Affected Groundwater” excludes groundwater impacted by releases from the University Disposal Areas regardless of whether it is determined that the University Disposal Areas contain waste from the LEHR Facility.

4. The Term “University-Affected Groundwater” means groundwater containing contaminants released from the University Disposal Areas.

5. The term “Adjacent Areas” means the portions of the UC Davis campus and adjacent areas, including, but not limited to, areas shown in Figure 1, other than the LEHR Facility and University Disposal Areas.

6. The term “Contingent Remediation” means an undetermined remedial action implemented by DOE if residual soil contaminants in a DOE area impact groundwater in the future. The response action, if required, will be determined in the future based on available technology, site conditions, and acceptance by the regulatory agencies in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (“CERCLA”) process.

C1.0 Sampling Methods

Monitoring well samples will be collected according to SOP 9.3, "Low-Flow Ground Water Sampling." A sample-preparation area will be established adjacent to the well location. The work surface will be covered with plastic sheeting to minimize the potential spread of contamination. The following equipment will be staged in the sample-preparation area:

- A spill kit
- Personal protective equipment
- Sample containers
- A decontamination station
- Low-flow pump controller
- Flow-through cell multimeter
- Water level meter
- A wastewater drum
- Custody seals
- Chain-of-custody forms
- Coolers with ice

The groundwater samples will be collected following EPA guidance for low-flow groundwater sampling (EPA 1996), including monitoring for specific conductance, pH, oxidation-reduction potential, dissolved oxygen, and turbidity, until all are within the stabilization goals for three consecutive readings. The stabilization goals are as follows:

- **Specific conductance, oxidation-reduction potential, dissolved oxygen, and turbidity:** ±10%
- **pH:** ±0.2

Well purging and groundwater sample collection will be performed with dedicated bladder pumps or similar pumps suitable for low-flow purging. Sampling containers, field filtration, preservation methods (if any), and holding times will be as specified in Table C-1. All purge water and decontamination water generated during sampling will be disposed of through the campus wastewater treatment plant.

Table C-1. Analytical Parameters for Groundwater Samples

Parameter	Method Reference	Container	Sample Handling/ Preservation	Holding Time	Reporting Limit[a]	Background Level[j]	MCL[k]
Metals							
Aluminum	SW-846, Method 6020[b]	250-milliliter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	50 µg/L	5.86 µg/L[l]	1000 µg/L
Chromium (total)					1 µg/L	43.7 µg/L	50 µg/L
Iron					50 µg/L	502 µg/L	NA
Manganese					1 µg/L	10 µg/L	NA
Molybdenum					1 µg/L	3.13 µg/L	NA
Nickel					1 µg/L	141 µg/L	100 µg/L
Selenium					1 µg/L	1.74 µg/L	50 µg/L
Silver					1 µg/L	<1 µg/L	NA
Zinc					5 µg/L	20.9 µg/L	NA
Mercury	SW-846, Method 7470A[b]	250-milliliter polyethylene plastic	Filter[i], nitric acid, pH <2	28 days	0.2 µg/L	0.0479 µg/L[l]	2 µg/L
Hexavalent chromium	SW-846, Method 7199[b]	250-milliliter polyethylene plastic	Filter[i], 4 °C	24 hours	1 µg/L	40 µg/L	50 µg/L
Radionuclides							
Americium-241	EML HASL 300Am[c]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	<0.71pCi/L	15 pCi/L
Gross beta	EPA 900.0	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	3 pCi/L	2.88 pCi/L[l]	4 millirem/year
Cesium-137	EPA Method 901.1[d]	2-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	5 pCi/L	<5 pCi/L	200 pCi/L[m]
Strontium-90	EPA Method 905.0[e]	2-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	<1 pCi/L	8 pCi/L[m]
Carbon-14	EPA EERF C-01[f]	1-liter polyethylene plastic	4 °C	180 days	7 pCi/L	<7 pCi/L	2000 pCi/L[m]
Radium-226	EPA Method 903.1[g]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	1.17 pCi/L	5 pCi/L
Uranium-238	EML HASL 300U[c]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	0.946 pCi/L[l]	20 pCi/L
General							
Nitrate (as nitrogen)	EPA Method 300.0[h]	250-milliliter polyethylene plastic	4 °C	48 hours	0.1 mg/L	15 mg/L	10 mg/L

Table C-1. Analytical Parameters for Groundwater Samples (continued)

Parameter	Method Reference	Container	Sample Handling/ Preservation	Holding Time	Reporting Limit[a]	Background Level[j]	MCL[k]
Formaldehyde	SW-846, Method 8315A[b]	1-liter amber glass	4 °C	72 hours	50 µg/L	13 µg/L[l]	NA
Organics							
1,1-Dichloroethane	SW-846, Method 8260B[b]	3 each 40-milliliter VOA glass	hydrochloric acid, pH <2, 4 °C	14 days	0.5 µg/L	0 µg/L	5 µg/L
Benzene					0.5 µg/L	0 µg/L	1 µg/L
Chloroform					0.5 µg/L	0 µg/L	80 µg/L
Chlordane	SW-846, Method 8081A[b]	1-liter amber glass (2 each)	4 °C	7 days to extraction, 40 days to analysis	0.1 µg/L	0 µg/L	0.1 µg/L
Dieldrin					0.05 µg/L	0 µg/L	NA

Notes:

[a] As shown, reporting limits are at or below MCLs for all constituents and at or below background levels for all inorganics except ^{241}Am. Reporting limits are above background levels for aluminum, mercury, gross beta, ^{238}U, and formaldehyde because background levels for these constituents are based on trace detections below the reporting limit.

[b] From the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA 2015b).

[c] From *The Procedures Manual of the Environmental Measurements Laboratory* (DOE 1997).

[d] "Gamma Emitting Radionuclides" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[e] "Radioactive Strontium" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[f] EPA, Eastern Environmental Radiation Facility.

[g] "Radium-226: Radon Emanation Technique" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[h] *Determination of Inorganic Anions by Ion Chromatography* (EPA 1993).

[i] Glass fiber, 0.45-micrometer filter.

[j] Background levels determined according to RD/RAWP procedures (DOE 2010) using 2011 and 2012 groundwater monitoring program data. Although additional background data were collected in 2016 and 2017, background updates were deferred as discussed in the second paragraph of Section 3.0.

[k] Lower of California or federal primary MCLs.

[l] Background level is trace concentration (detected below the reporting limit).

[m] Beta/photon emitter derived activity yielding a dose of 4 millirem per year as defined in *National Bureau of Standards Handbook 69* (DOC 1963).

Abbreviations:

Am = americium
EERF = Eastern Environmental Radiation Facility
EML = Environmental Measurements Laboratory
MCL = maximum contaminant level
µg/L = micrograms per liter
mg/L = milligrams per liter
NA = not available
pCi/L = picocuries per liter
U = uranium
VOA = volatile organics analysis

C2.0 Sample Documentation

The usability of the data will depend on the data's quality. Following proper procedures for both sample collection and sample analysis reduces sampling and analytical error. To ensure sample integrity, samples will be handled using complete chain-of-custody documentation and preserved using proper sample preservation techniques, holding times, and shipment methods. Obtaining valid and comparable data also requires adequate quality assurance and quality control procedures and documentation.

The components of the sample documentation and custody system will include the following:

- The chain of custody
- The field logbook
- Sample numbers
- Sample labels
- Custody seals

C2.1 Chain-of-Custody

Members of the sample team will complete chain-of-custody forms to track sample custody and to specify the requested analyses.

C2.2 Field Records

Descriptions and observations made during field sampling activities will be documented in the *Water Sampling Data Sheets* (Attachment 6.2 of SOP 1.2), *Field Activity Daily Log Sheets* (Attachment 6.1 of SOP 1.2), and *Test Equipment List and Calibration Log* (Attachment 6.1 of SQP 8.1) in the field work protocol package. The following will be recorded in the field work protocol forms:

- Project name and number
- Site location
- Purpose of the sampling
- Description of field activities
- Names of sampling personnel
- Date and time of entries
- Date and time the sample was collected
- Sample location and ID number
- Sampling method
- Field observations
- Results of field measurements
- Results of field instrument calibrations

The completed forms are scanned and stored in the project directory, and the original forms are filed in the project folders.

C2.2.1 Sample ID Numbers

All samples will be assigned a unique sample ID number (i.e., sample designation), using the following format:

GWDOEXXXX

where:
GWDOE = groundwater sample associated with the DOE area
XXXX = chronological sample number (e.g., 0017, 0018, 0019)

C2.2.2 Sample Labels

Sample labels will be attached to individual sample containers and will contain the following information:

- Project number
- Sample ID number
- Date and time the sample was collected
- Sampler's initials
- Requested analyses

C2.2.3 Custody Seals

Custody seals will be used to detect tampering and will be placed over the lid of the container and annotated with the following information:

- Project number
- Sample ID number
- Date and time the sample was collected

A custody seal shall not be placed over a volatile organic analysis vial septum.

C2.3 Data Validation and Compilation

The analytical laboratories are contracted to deliver detailed analytical reports, including calibration data and raw data from the analysis of primary samples and quality control samples, sufficient for the reconstruction of all sample results. The project chemist or a designee who meets the qualifications requirements stated in the QAPP will validate the analytical results in accordance with data validation procedures defined in the QAPP. Once validated, the data will be transferred to the project database in accordance with procedures described in the QAPP.

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(e) Providing for activities that require the implementation of the DOE Areas SMP.

(f) Controlling weeds and performing miscellaneous maintenance activities, as requested by DOE.

(g) Conducting DOE groundwater and surface water monitoring and reporting, as requested by DOE.

(h) Providing other services as agreed to by DOE and UC Davis.

Such Grant shall be in place within sixty (60) days of the effective date of this Agreement and shall be renewed annually for as long as the Department of Toxic and Substance Control (DTSC) Land Use Covenant remains in place. The University shall have no obligation to perform the services identified in subparagraphs (b) through (h), above, during any period for which DOE has not provided a Grant that covers the University's full costs for providing such services. In accordance with the provisions of CERCLA, DOE shall conduct Five-Year Reviews to ensure the protectiveness of the remedy. Following each Five-Year Review, DOE shall consult with the United States Environmental Protection Agency ("EPA"), DTSC, and the Regional Water Quality Control Board, or the successors to these agencies, to determine whether it is necessary for the Land Use Covenant to remain in effect or whether the Land Use Covenant can be terminated entirely or amended to delete specific DOE waste units from the land use restrictions.

4. DOE will direct the contractors it selects to conduct DOE activities to keep the University apprised of their activities and to coordinate in advance with the University regarding any activities that might interfere with the University's use of those DOE

Improvements that have been transferred to the University pursuant to Article VI of this Agreement.

5. DOE shall notify the University through the UC Davis Project Manager of any of its activities that might implicate the permit requirements of the Resource Conservation and Recovery Act ("RCRA") regarding the LEHR Facility. DOE shall also provide any other information related to its activities that could impact UC Davis's National Pollutant Discharge Elimination System ("NPDES") Permits (i.e., the permit for the main campus waste water treatment plant and the campus's general storm water permit) as they apply to the LEHR Facility. The University is responsible for obtaining and complying with the NPDES Permits. The University is responsible for obtaining and complying with any permits that are required in connection with the activities set forth in Article III. DOE is responsible for obtaining and complying with any NPDES, RCRA, or other permits that are required in connection with the activities set forth in Article IV.

6. DOE and the University shall each pay, in accordance with state and federal law, those reasonable and necessary costs incurred by such state regulatory agencies related to the activities that each Party is obligated to perform under this Agreement or under other agreements with, or directives from, such regulatory agencies. The Parties shall cooperate to ensure that they establish reasonable and efficient procedures that will allow the state regulatory agencies to allocate their costs.

ARTICLE III − RESPONSIBILITIES OF THE UNIVERSITY

The University agrees to undertake at its own expense the following activities:

A. Environmental Restoration

1. The University agrees to conduct required response actions inclusive of the remedial investigation, feasibility study, removal, remedial action, reports, sampling, analyses, and any other investigative and remedial activities required by federal and state regulatory agencies involving the University Disposal Areas and University-Affected Groundwater.

2. The University agrees to perform groundwater monitoring and reporting for DOE-Affected Groundwater until ninety (90) days after the signature of both Parties to this Agreement. The University agrees to include an analysis of DOE-Affected Groundwater in the University Feasibility Study and ROD. The University shall have no obligation to perform, or responsibility for, any interim action or response action that federal and state regulatory agencies may require for DOE-Affected Groundwater by inclusion of an analysis or discussion of DOE-Affected Groundwater in the University Feasibility Study or ROD.

3. Subject to the provisions of Sections IV.A and V.C of this Agreement, the University agrees to conduct any investigative or remedial work that federal or state agencies may require for sources of contaminants in the Adjacent Areas.

B. Removal of Wastes and Samples

1. Except as otherwise provided for in Section IV.A of this Agreement, the handling, storage, and disposal of all wastes (radioactive, hazardous, mixed, and solid) generated by the University's activities under this Agreement, and of all samples and other

research materials of the University currently stored in the LEHR Facility, are the sole responsibility of the University.

C. In the event that the University plans a project beyond repair, maintenance, and minor construction that may trigger the SMP, the University will notify DOE at least ninety (90) days prior to the commencement of field activities.

ARTICLE IV − RESPONSIBILITIES OF DOE

DOE agrees to undertake at its own expense the following activities:

A. Environmental Restoration

1. DOE shall complete the remedial investigations, feasibility studies, removal, remedial action, reports, sampling, analyses, and any other investigative, remedial, and IR & LTSMCR activities required by federal and state regulatory agencies for the LEHR Facility, to the satisfaction of the regulatory agencies—provided, however, that any decontamination or decommissioning of the DOE Improvements has been or shall be performed under the Atomic Energy Act of 1954 and applicable DOE Orders.

2. Ninety (90) days after signature by both Parties to this Agreement, DOE will assume full responsibility for groundwater monitoring and reporting for DOE-Affected Groundwater. All post–University ROD actions required for DOE-Affected Groundwater shall be the sole responsibility of DOE. Any interim or removal actions required by federal and state regulators before EPA signs the University ROD shall be the sole responsibility of DOE.

3. DOE shall prepare an SMP describing the nature and extent of contamination remaining in DOE areas to address actions that may be required to protect public health and the environment relevant to residual DOE contamination left on site. A plan will be

prepared with the DOE Remedial Action Work Plan and will address the need for any evaluation, risk assessment, sampling, characterization, containment, treatment, removal, disposal, or other action that may be required for future remediation, use, operations, or maintenance activities anticipated to be undertaken by the University. DOE is solely responsible for the costs of implementing the SMP and any additional administrative, engineering, design, construction, or operations and maintenance costs incurred by the University in the course of its projects that arise due to the presence of DOE contamination left at the site. The Parties may agree to the implementation of the SMP by the University on behalf of DOE. If the University plans a project at the site that will necessitate the implementation of the SMP, and that may require additional evaluation, the University will request DOE's input on the management options.

4. DOE shall continue to perform storm water monitoring, as required, at Lift Station-1. This storm water monitoring shall not include any monitoring required as a result of University operations or releases.

5. DOE agrees to prepare any reports, assessments, or other documents that may be required by federal or state regulatory agencies relating to its IR & LTSMCR of the LEHR Facility. Such reports and assessments may include, but are not limited to, risk assessments, ecological assessments, and assessments concerning release limits on residual radionuclides in soils.

6. The handling, storage, and disposal of all wastes (radioactive, hazardous, mixed, and solid) generated by DOE's activities under this Agreement are the sole responsibility of DOE. For purposes of this Agreement, the term "wastes" shall not include the following: (1) research materials, if any, that the University failed to identify as having

been used for DOE research under the Contract as required by the Prior MOA and Paragraph 1 of Section III.B of this Agreement, or (2) contaminated media such as soil, structures, buildings, debris, surface water, or groundwater that remain *in situ* once DOE has completed its activities under the DOE ROD to the satisfaction of the regulatory agencies unless such contaminated media are required to be removed or managed to comply with an SMP, or as part of contingent remediation determined to be necessary in the future. No waste will be disposed of, or otherwise remain, on University property without the express written permission of the University—provided, however, that DOE shall have no obligation to remove any contaminated media that remain *in situ* once DOE has completed its activities under the DOE ROD to the satisfaction of the regulatory agencies. The University agrees that permission to dispose of wastes at the LEHR Facility will not be unreasonably withheld. DOE shall be responsible for filing annual reports with the State of California for the management of hazardous and radioactive mixed wastes generated by or associated with DOE's activities as required under applicable laws and regulations.

ARTICLE V − COVENANTS NOT TO SUE

A. Covenants Not to Sue for Past Costs

Each Party covenants that it shall not sue or otherwise seek recovery or reimbursement of any kind from the other Party, or its employees, contractors, representatives, or agents, for costs it incurred after September 30, 1989, through and including the effective date of this Agreement, in investigating or remediating the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and Adjacent Areas. For purposes of this Agreement, such costs are referred to herein as "past costs" and consist of sums a Party paid or

became obligated to pay during the period set forth above for investigation or remediation of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and Adjacent Areas; for regulatory oversight costs; for defense or attorneys fees related to the investigation and remedial work; and for compliance with the orders or mandates of agencies or courts related to the investigation and remedial work.

B. Covenants Not to Sue for Future Costs

Except as specifically provided below in Section V.C of this Agreement, each Party covenants that it shall not sue or otherwise seek relief of any kind from the other Party, or its employees, contractors, representatives, or agents, for costs incurred after the effective date of this Agreement, arising from the obligations each Party has assumed under this Agreement. For purposes of this Agreement, such costs are referred to as "future costs" and consist of, but are not limited to, sums for investigation, remediation, or IR & LTSMCR of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and Adjacent Areas; for compliance with this Agreement; for regulatory costs; for defense or attorneys fees related to the investigation and remedial work; and for compliance with the orders or mandates of agencies or courts related to the investigation, remediation, or IR & LTSMCR work. Except as specifically provided below in Section V.C of this Agreement, these covenants not to sue apply to all claims involving the investigation, remediation, or IR & LTSMCR of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, and DOE-Affected Groundwater; claims for investigation or remediation of the Adjacent Areas; claims for regulatory costs; and claims involving compliance with the orders or mandates of agencies or courts related to the investigation, remediation, and IR & LTSMCR work based on federal law, state law, the Contract, or the Occupancy Agreement.

C. Exceptions to the Covenants Not to Sue

The Parties agree that the covenants not to sue set forth in this Section V shall not apply in the following situations:

1. **Claims Seeking to Enforce this Agreement.** The covenants not to sue in this Section V shall not apply to claims by either Party to enforce the terms of this Agreement.

2. **Claims by a Regulatory Agency in Conflict with this Agreement.** The Parties acknowledge that one purpose of this Agreement is to allocate between the Parties responsibilities for certain activities related to the investigation, remediation, or IR & LTSMCR of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and Adjacent Areas. Should a regulatory agency assert a claim against a Party involving an activity or area that is the responsibility of the other Party under this Agreement, the covenants not to sue set forth in this Section V shall not apply to the extent that the Party against which the agency asserted the claim may seek relief from the other Party requiring it to respond to the agency's claim and to reimburse the Party against which the agency asserted the claim for any costs it incurred in responding to the claim.

3. **Claims by Third Parties other than Regulatory Agencies.** Neither the covenants not to sue nor any other provision of this Agreement shall apply to claims by third parties other than regulatory agencies. With respect to third-party claims, the Parties reserve all of their respective rights under applicable law, this Agreement, the Occupancy Agreement, and the Contract.

ARTICLE VI − DOE IMPROVEMENTS AT THE LEHR

A. Transfer of Certain DOE Improvements to the University

1. Pursuant to Article VII of the Occupancy Agreement, DOE transferred ownership of the DOE Improvements or portions thereof (hereafter referred to as "former DOE Improvements or portions thereof") to the University. This transfer of ownership of the DOE Improvements or portions thereof did not and does not affect in any way DOE's decontamination and decommissioning obligations under the Occupancy Agreement, the Contract, or this Agreement.

2. DOE previously released the DOE Improvements and the University has been using these improvements for research and appropriate support work sponsored by entities other than DOE. The University shall be responsible for any contamination by hazardous substances, radioactivity, or ionizing radiation fields resulting from the University's use of these former DOE Improvements or portions thereof.

ARTICLE VII − MISCELLANEOUS PROVISIONS

A. Amendment

This Agreement may be amended at any time by mutual consent of the Parties. Any such amendments shall be in writing, shall be explicitly identified as an Amendment to this Agreement, and shall be signed by both Parties.

B. Anti-Deficiency Act

No provision of this Agreement shall be interpreted as or constitute a commitment or requirement that DOE shall obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341. Payments by DOE are subject to the availability of appropriated funds. Payments by the University are subject to the availability of designated funds. The Parties agree that, during the period in which this Agreement remains in effect, each will be diligent in seeking appropriation or designation of funds for the purpose of performing its respective obligations under this Agreement.

C. Entire Agreement

This Agreement contains the entire agreement between the Parties with respect to the IR & LTSMCR of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, and Adjacent Areas, and with respect to the University's ownership of, and DOE access to, the DOE Improvements at the LEHR Facility. It supersedes all prior understandings, negotiations, oral agreements, or written agreements between the Parties including, but not limited to, the Prior MOA and Article XIV ("CONTINGENCIES - LITIGATION AND CLAIMS") of Contract EY-76-C-03-0472 as to the investigation and remediation of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, and DOE-Affected Groundwater—provided, however, that this Agreement does not supersede the Contract or the Occupancy Agreement except as to their application to the investigation and remediation of the LEHR Facility, the University Disposal Areas, University-Affected Groundwater, DOE-Affected Groundwater, Adjacent Areas, and DOE access to the DOE Improvements at the LEHR Facility prior to the termination of the Occupancy Agreement.

D. Effective Date

The effective date of this Agreement is the date of the last signature.

E. No Third-Party Beneficiaries

This Agreement is solely for the benefit of the University and DOE, and shall create no rights in favor of, and may not be enforced by, any other person or entity.

F. Successors and Assigns

This Agreement shall bind and inure to the benefit of the Parties and their respective successors and assigns.

G. Governing Law

This Agreement shall be governed by and construed in accordance with the laws of the State of California and the United States.

H. Waiver of Provisions

No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision, whether or not similar, nor shall any waiver constitute a continuing waiver. No waiver shall be binding unless executed in writing by the Party making the waiver.

I. Separability

If any term, covenant, condition, or provision of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions shall remain in full force and effect and shall in no way be affected, impaired, or invalidated.

J. Headings

The subject headings used in this Agreement are for convenience only and shall not be deemed to affect the meaning or construction of any of the terms of this Agreement.

K. Counterparts

This Agreement may be executed in counterparts, each of which shall be deemed an original, and when taken together shall constitute an integrated agreement.

United States Department of Energy
Deputy Director, Office of Legacy Management

David W. Geiser

Date: June 23, 2009

The Regents of the University
of California

STAN NOSEK, VICE CHANCELLOR - ADMINISTRATION

Date: JULY 8, 2009

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Appendix B

Covenant to Restrict Use of Property

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RECORDING REQUESTED BY:
The Regents of the University of California
c/o Real Estate Services Group
1111 Franklin Street, 6th Floor
Oakland, California 94706-5200
Attention: Director of Real Estate

WHEN RECORDED, MAIL TO:

Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826
Attention: Charlie Ridenour
Performance Manager, Cleanup Program

Recorded in Official Records,
Solano County
Doc#: 201400051822
7/11/2014 3:11 PM

SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE

No Recording Fee pursuant to Government Code 27383

COVENANT TO RESTRICT USE OF PROPERTY

ENVIRONMENTAL RESTRICTION

(Re: Portions of County of Solano Assessor's Parcel No. 110-05-04 UC Davis Laboratory for Energy-related Health Research / Old Campus Landfill (LEHR/OCL) Superfund Site, Site Code 100424)

This Covenant and Agreement ("Covenant") is made by and between the Regents of the University of California, a California public corporation ("University" or the "Covenantor"), the current owner of property situated at the University of California, Davis, County of Solano, State of California, depicted in the attached Exhibit "A" (the "Property"), and the Department of Toxic Substances Control (the "Department"). Pursuant to Civil Code section 1471, the Department has determined that this Covenant is reasonably necessary to protect present or future human health or safety or the environment as a result of the presence on the land of hazardous materials as defined in Health and Safety Code section 25260 in certain portions of the Property. The Covenantor and Department, collectively referred to as the "Parties," hereby agree, pursuant to Civil Code section 1471 and Health and Safety Code section 25355.5, that the use of the Property be restricted as set forth in this Covenant; and the Parties

further agree that the Covenant shall conform with the requirements of California Code of Regulations, title 22, section 67391.1. The provisions of this Covenant shall be for the benefit of, and shall be enforceable by, the United States Environmental Protection Agency ("U.S. EPA") as a third party beneficiary pursuant to general contract law, including, but not limited to, Civil Code Section 1559.

ARTICLE I
STATEMENT OF FACTS

1.01. The former Laboratory for Energy-related Health Research ("LEHR") (*see* Exhibit "A") comprises approximately 15 acres ("LEHR Site" or "Site") in the southern portion of Solano County's Assessor's Parcel No. 110-05-04 (Exhibit "B"). The Property comprises eight distinct areas described and depicted in Exhibit "C" that cover approximately 2.4 acres and lie within the boundary of the LEHR Site (see Exhibit "A"). These eight areas are known as the: 1) Radium/Strontium Treatment System Areas (including Domestic Septic System 2 Area); 2) Domestic Septic System 3 Area; 3) Domestic Septic System 4 Area; 4) Dry Wells A-E Area; 5) Eastern Dog Pens Area; 6) Southwest Trenches Area; 7) Eastern Remediation Support Area; and 8) Western Remediation Support Area. These eight areas correspond to areas 1, 2, 3, 4, 5, 6, 7 and 8 within Exhibit C, respectively, and may be referred to in this Covenant by name or exhibit.

1.02. The LEHR Site was operated by the Atomic Energy Commission (now United States Department of Energy ["DOE"]) as LEHR (referred to as the Radiobiology Laboratory prior to 1979) under a series of Occupancy Agreements with the Regents of the University of California initiated in 1958. The LEHR Site was placed on the National Priorities List by the Environmental Protection Agency on May 31, 1994, 59 Federal Register 27,989. Due to releases of hazardous materials during DOE's occupancy at the Site, DOE and U.S. EPA entered into a Federal Facility Agreement ("FFA") on October 29, 1999, with the Regional Water Quality Control Board and the California Department of Public Health (formerly the California Department of Health Services)

joining as signatories in 1999 and the Department joining in 2000. The intent of the FFA was to ensure that environmental impacts associated with past activities at the LEHR Site are thoroughly investigated, and appropriate response actions taken as necessary to protect human health, welfare, or the environment. Pursuant to the FFA, DOE selected cleanup remedies in the 2009 Record of Decision ("ROD") under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"). The remedies selected in the ROD require that the Property be subject to land use controls to restrict certain uses, in the form of this Covenant.

1.03. The ROD details the selected remedies for the Property. The Property is restricted because of soil and groundwater contamination, discussed in detail below. For certain areas of the Property, contingent remediation may be necessary if groundwater monitoring indicates that groundwater impacts have occurred pursuant to conditions stated in the ROD. Additionally, a land-use restriction is being imposed at the area described in Exhibit C-6 and depicted on Sheet 2 in Exhibit C. In addition, two areas have been designated for use as staging areas if contingent remediation (*see* section 1.05) is required. These areas are the Eastern Remediation Support Area and Western Remediation Support Area (*see* Exhibits "C-10" and "C-11").

1.04. DOE and the Covenantor ("MOA Parties") entered into a Memorandum of Agreement for environmental restoration and decontamination on March 13, 1990 amended February 17, 1993, November 30, 1993, and again on June 18, 1997, and superseded on July 8, 2009 (referred to collectively as the "MOA"). This MOA outlines the roles and responsibilities of the MOA Parties regarding the investigation and remediation of the LEHR Site. The MOA Parties agree that the required investigation, remediation, long-term surveillance and maintenance, and contingent remediation ("IR & LTSMCR") activities at the Property shall be conducted by DOE.

1.05. Restrictions on soil disturbance apply to six of eight areas of the Property, as identified in Exhibit C-2, Exhibit C-4, Exhibit C-5, Exhibit C-7, Exhibit C-8, and Exhibit C-9. Disturbance of soil is only allowed in compliance with the Soil Management Plan

("SMP") included as an appendix to the Remedial Design/Remedial Action Work Plan dated November 2010, which documents the requirements and methods for implementing remedies selected in the ROD.

The ROD requires groundwater monitoring and this Covenant prohibits interference with the groundwater monitoring wells required for the implementation of the remedies. Groundwater monitoring will be conducted in five of the eight areas of the Property, as identified in Exhibit C-1, Exhibit C-3, Exhibit C-5, Exhibit C-7, and Exhibit C-9 to confirm groundwater protection. If groundwater monitoring indicates that groundwater impacts as defined in the ROD have occurred due to constituents of concern ("COCs") remaining in soil, DOE will evaluate remedial options and determine whether contingent remediation may be required, in accordance with the ROD.

1.06. Land use restrictions listed in section 4.01 are required for the area described in Exhibit C-6 and depicted on Sheet 2 of Exhibit C due to polycyclic aromatic hydrocarbons in the soil, described in more detail below.

1.07. Human Health Risk Assessment. As detailed in the ROD, the Property contains hazardous substances in soil that are defined in Health and Safety Code section 25316 as hazardous substances. Specific COCs that pose a human health risk, and the maximum concentrations detected, are as follows: the Southwest Trenches Area contains strontium-90 (16 picocuries/g); the Eastern Dog Pens Area contains strontium-90 (8.3 picocuries/g) and dieldrin (0.22 mg/kg); and the Domestic Septic System 4 contains benzo(a)anthracene (3.8 mg/kg), benzo(a)pyrene (2.4 mg/kg), benzo(b)fluoranthene (2.7 mg/kg), benzo(k)fluoranthene (1.5 mg/kg), dibenzo (a,h)anthracene (1.1 mg/kg), and indeno(1,2,3-cd)pyrene (1.5 mg/kg).

The human health risk assessment performed by DOE shows COCs present in soil at the Southwest Trenches and Eastern Dog Pen areas are: 1) statistically above background; and 2) present an excess cancer risk above one in one million. The residual contaminants in these areas do not pose a human health risk unless soil containing these contaminants is disturbed, in which case an unacceptable risk to human health or safety or the environment could result. Thus the SMP is required to

prevent such potential risk.

The human health risk assessment performed by DOE shows COCs present in soil at the Domestic Septic System 4 are: 1) statistically above background; and 2) present an excess cancer risk above one in one million and 3) soil exposure and plant ingestion pose a human health risk. Therefore the ROD requires this Covenant restrict the uses as described in section 4.01 and requires compliance with the SMP to prevent an unacceptable risk to human health or safety or the environment.

1.08. Groundwater Protection. As further detailed in the ROD, the Property contains additional hazardous substances in soil that are defined in Health and Safety Code section 25316 as hazardous substances. These residual contaminants present in soil on the Property are a potential risk to groundwater quality.

Specific COCs in soil that are in excess of remediation goals for protection of groundwater are listed in Table 2-8 of the ROD, and are present in the areas of the Property described in Exhibit C-1, Exhibit C-3, Exhibit C-5, Exhibit C-7, and Exhibit C-9 and depicted on survey maps in Exhibit C. These areas contain a variety of COCs that require groundwater monitoring to demonstrate COCs are not migrating to groundwater, and that groundwater protection is maintained in conformance with the groundwater quality goals. Additional COCs listed in Table 2-9 of the ROD are present in the soil in concentrations that do not presently pose a risk to human health or groundwater quality, but may impair groundwater quality in the future. Groundwater monitoring will continue until it can be shown that the COCs in soil no longer pose a threat to water quality.

The human health risk assessment performed by DOE shows that ingestion of groundwater is not the primary risk to human health. However, to protect the groundwater quality, monitoring is required with possible contingent remediation, per the ROD. Based on the human health risk assessment the Department concludes that the Property, as remediated and subject to the restrictions of this Covenant, does not present an unacceptable threat to human health or safety or the environment.

ARTICLE II
DEFINITIONS

2.01. Department. "Department" means the California Department of Toxic Substances Control and includes its successor agencies, if any.

2.02. U.S. EPA. "U.S. EPA" means the United States Environmental Protection Agency and includes its successor agencies, if any.

2.03. Environmental Restrictions. "Environmental Restrictions" means all protective provisions, covenants, restrictions, prohibitions, and terms and conditions as set forth in any section of this Covenant.

2.04. Improvements. "Improvements" includes, but is not limited to: buildings, structures, roads, driveways, improved parking areas, wells, pipelines, or other utilities.

2.05. Lease. "Lease" means lease, rental agreement, or any other document in which the lessor grants to a lessee a right to use or occupy any portion of the Property.

2.06. Occupant. "Occupant" means Owners and any person or entity entitled by ownership, leasehold, or other legal relationship to the right to occupy any portion of the Property.

2.07. Owner. "Owner" means the Covenantor, and all successors in interest including heirs and assigns, who at any time hold title to all or any portion of the Property.

ARTICLE III
GENERAL PROVISIONS

3.01. Runs with the Land. This Covenant sets forth Environmental Restrictions that apply to and encumber the Property and every portion thereof no matter how it is improved, held, used, occupied, leased, sold, hypothecated, encumbered, or conveyed. This Covenant: (a) runs with the land pursuant to Health and Safety Code section 25355.5 and Civil Code section 1471; (b) inures to the benefit of and passes with each and every portion of the Property, (c) is for the benefit of, and is enforceable by the Department, and (d) is imposed upon the entire Property unless expressly stated as applicable only to a specific portion thereof.

3.02. Binding upon Owners/Occupants. Pursuant to the Health and Safety Code, this Covenant binds all owners of the Property, their heirs, successors, and assignees, and the agents, employees, and lessees of the owners, heirs, successors, and assignees. Pursuant to Civil Code section 1471, all successive owners of the Property are expressly bound hereby for the benefit of the Department.

3.03. Incorporation into Deeds and Leases. This Covenant shall be incorporated by reference in each and every deed and lease for any portion of the Property.

3.04. Conveyance of Property. The Owner shall provide written notice to the Department not later than thirty (30) days after any conveyance of any ownership interest in the Property (excluding leases, and mortgages, liens, and other non-possessory encumbrances). The written notice shall include the name and mailing address of the new owner of the Property and shall reference the site name (UC Davis Laboratory for Energy-related Health Research / Old Campus Landfill ("LEHR/OCL") Superfund Site) and site code (100424) as listed on page one of this Covenant. The notice shall also include the Assessor's Parcel Number (APN) (No. 110-05-04) noted on page one. If the new owner's property has been assigned a different APN, each such

APN that covers the Property must be provided. The Department shall not, by reason of this Covenant, have authority to approve, disapprove, or otherwise affect proposed conveyance, except as otherwise provided by law or by administrative order.

3.05. Costs of Administering the Covenant to be paid by Owner. The Department will incur costs associated with the administration of this Covenant. These costs must be paid by the Owner pursuant to California Code of Regulations, title 22, section 67391.1(h). One purpose of the MOA includes delineation of the responsibilities of DOE to cover costs incurred by the Owner associated with implementing and maintaining this Covenant. These costs are currently paid pursuant to the terms of the MOA. If, however, payments are not made pursuant to the MOA, the Owner will be responsible for the Department's costs under this section.

ARTICLE IV
RESTRICTIONS AND REQUIREMENTS

4.01. Prohibited Uses. The area described in Exhibit C-6 and depicted on sheet 2 in Exhibit C shall not be used for any of the following purposes:

(a) A residence, including any mobile home or factory built housing, constructed or installed for use as residential human habitation.

(b) Growing any plants for human consumption.

(c) A day care center for children.

4.02. Soil Management. The following soil management conditions apply to the six areas of the Property described and depicted in Exhibit C-2, Exhibit C-4, Exhibit C-5, and Exhibits C-7 through C-9:

(a) No activities that will disturb soil at or below grade (e.g., excavation, grading, removal, trenching, filling, earth movement, mining, or drilling) shall be allowed in these areas unless abiding by the SMP approved by the U.S. EPA and the Department.

(b) Any contaminated soils brought to the surface by grading, excavation, trenching or backfilling shall be managed in accordance with all applicable provisions of state and federal law.

4.03. Non-Interference with Groundwater Monitoring Wells.

(a) All uses shall preserve the physical accessibility to and integrity of the groundwater monitoring system.

(b) The groundwater monitoring system shall not be altered without prior written approval by the Department.

4.04. Access for Department and the U.S. EPA. The Department shall have reasonable right of entry and access to the Property for inspection, monitoring, and other activities consistent with the purposes of this Covenant as deemed necessary by the Department in order to protect the public health or safety, or the environment. Nothing in this instrument shall limit or otherwise affect U.S. EPA's right of entry and access or U.S. EPA's authority to take response actions under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; or federal law. Nothing in this instrument shall limit or otherwise effect the Department's right of entry and access, or authority to take response actions, under CERCLA; the National Contingency Plan, 40 Code of Federal Regulations Part 300 (1997) and its successor provisions; Chapter 6.8, Division 20 of the California Health and Safety Code; California Civil Code, or other applicable state law.

4.05 Access for Implementing Operation and Maintenance. The parties responsible for implementing the operation and maintenance activities shall have reasonable right of entry and access to the Property for the purpose of implementing the operation and maintenance activities until the Department determines that no further operation and maintenance is required.

4.06. Inspection and Reporting Requirements. The Owner shall conduct an

annual inspection of the Property verifying compliance with this Covenant. The annual inspection shall include a verification of permits obtained for any soil-disturbing activities, a review of soil-disturbing activities for compliance with the SMP, a review of disposal practices for waste generated during soil-disturbing activities, and suggested changes to the SMP. The Owner shall submit an annual inspection report to the Department for its approval by January 15th of each year. A copy of the annual inspection report shall also be submitted simultaneously to U.S. EPA. The annual inspection report must include the dates, times, and names of those who conducted the inspection and reviewed the annual inspection report. It also shall describe how the observations were performed that were the basis for the statements and conclusions in the annual inspection report (e.g., drive by, fly over, walk in, etc.). It shall contain the annual inspection results, review of compliance with the requirements of the SMP and certification of compliance with this Covenant, and discussion of any soil-disturbing activities and wastes generated. If violations are noted, the annual inspection report must detail the steps taken to return to compliance. If the Owner identifies any violations of this Covenant during the annual inspections or at any other time, the Owner must within ten (10) days of identifying the violation: determine the identity of the party in violation, send a letter advising the party of the violation of the Covenant, and demand that the violation ceases immediately. Additionally, copies of any correspondence related to the violation of this Covenant shall be sent to the Department and U.S. EPA within ten (10) days of its original transmission.

ARTICLE V
ENFORCEMENT

5.01. Enforcement. Failure of the Owner or Occupant to comply with this Covenant shall be grounds for the Department to require modification or removal of any Improvements constructed or placed upon any portion of the Property in violation of this Covenant. Violation of this Covenant, including but not limited to, failure to submit, or the submission of any false statement, record or report to the Department, shall be grounds for the Department to pursue administrative, civil, or criminal actions, as

provided by law.

5.02. Enforcement Rights of U.S. EPA as a Third Party Beneficiary. U.S. EPA, as a third party beneficiary, has the right to enforce the Environmental Restrictions contained herein.

ARTICLE VI
VARIANCE, REMOVAL, AND TERM

6.01. Variance. Any person may apply to the Department for a written variance from the provisions of this Covenant. Such application shall be made in accordance with Health and Safety Code section 25223 and a copy of the application shall be submitted to U.S. EPA simultaneously with the application submitted to the Department. No variance may be granted under this paragraph without prior notice to and an opportunity to comment by U.S. EPA.

6.02 Removal. Any person may apply to the Department to remove any or all restrictions imposed by this Covenant. Such application shall be made in accordance with Health and Safety Code section 25224 and a copy of the application shall be submitted to U.S. EPA simultaneously with the application submitted to the Department. No modifications may be granted under this paragraph without prior notice to and an opportunity to comment by U.S. EPA.

6.03 Term. Unless ended in accordance with paragraph 6.02, by law, or by the Department in the exercise of its discretion, after providing notice to and an opportunity to comment by U.S. EPA, this Covenant shall continue in effect in perpetuity.

ARTICLE VII
MISCELLANEOUS

7.01. No Dedication Intended. Nothing set forth in this Covenant shall be

construed to be a gift or dedication, or offer of a gift or dedication, of the Property, or any portion thereof to the general public or anyone else for any purpose whatsoever. Further, nothing set forth in this Covenant shall be construed to affect a taking under State or Federal law.

7.02. Recordation. The Covenantor shall record this Covenant, with all referenced Exhibits, in the County of Solano within ten (10) days of the Covenantor's receipt of a fully executed original.

7.03. Notices. Whenever any person gives or serves any Notice ("Notice" as used herein includes any demand or other communication with respect to this Covenant), each such Notice shall be in writing and shall be deemed effective: when delivered, if personally delivered to the person being served or to an officer of a corporate party being served, or three (3) business days after deposit in the mail, if mailed by United States mail, postage paid, certified, return receipt requested:

primary:	Environmental Manager Environmental Health and Safety University of California, Davis, One Shields Avenue Davis, California, 95616
with copies to:	The Regents of the University of California c/o Real Estate Services Group 1111 Franklin Street, 6th, Floor Oakland, California 94530 Attention: Director of Real Estate
and:	Real Estate Services University of California, Davis 255 Cousteau Place

Davis, California 95618
Attn: Executive Director

and to Department: Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, California 95826
Attention: Performance Manager, Cleanup Program

and to U.S.EPA: U.S. Environmental Protection Agency
Superfund Program
Region IX
75 Hawthorne Street
San Francisco, CA 94105-3901
Attn: LEHR Remedial Project Manager

Any party may change its address or the individual to whose attention a Notice is to be sent by giving written Notice in compliance with this paragraph.

7.04. Partial Invalidity. If this Covenant or any of its terms are determined by a court of competent jurisdiction to be invalid for any reason, the surviving portions of this Covenant shall remain in full force and effect as if such portion found invalid had not been included herein.

7.05. Statutory References. All statutory or regulatory references include successor provisions.

7.06. Incorporation of Exhibits. All attachments and exhibits to this Covenant are incorporated herein by reference.

IN WITNESS WHEREOF, the Parties execute this Covenant.

Covenantor: The Regents of the University of California, a California public corporation

By: _____

Title: Anne L. Shaw, Interim Secretary and Chief of Staff to The Regents of the University of California

Date: 7/8/14

APPROVED AS TO FORM

Date: 7/1/14 _____
Kelly L. Drumm

Department of Toxic Substances Control:

By: _____

Title: Charlie Ridenour, Branch Chief, Cleanup Program, Sacramento Office

Date: 3/3/2014

See loose California All-Purpose Acknowledgement

State of California

County of Alameda

On July 8, 2014 before me,

Drue M'Carthy, Notary Public

(space above this line is for name and title of the officer/notary),

personally appeared Anne L Shaw, who proved to me on the basis of satisfactory evidence to be the person(~~s~~) whose name(~~s~~) is/~~are~~ subscribed to the within instrument and acknowledged to me that ~~he~~/she/~~they~~ executed the same in ~~his~~/her/~~their~~ authorized capacity(~~ies~~), and that by ~~his~~/her/~~their~~ signature(~~s~~) on the instrument the person(~~s~~), or the entity upon behalf of which the person(~~s~~) acted, executed the instrument. I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal,

DRUE MCCARTHY
COMM # 1966988
ALAMEDA COUNTY
NOTARY PUBLIC-CALIFORNIA
MY COMMISSION EXPIRES
JAN. 21, 2016

Drue M'Carthy (seal)
Signature of Notary Public

California All-Purpose Acknowledgement

State of California
County of Sacramento

On March 3, 2014 before me,

Theresa M. Vigil, Notary Public,
(space above this line is for name and title of ~~the~~ officer/notary),

personally appeared Charlie Ridenour, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/~~are~~ subscribed to the within instrument and acknowledged to me that he/~~she/they~~ executed the same in his/~~her/their~~ authorized capacity(~~ies~~), and that by his/~~her/their~~ signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument. I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal,

THERESA M. VIGIL
Commission # 1962796
Notary Public - California
Sacramento County
My Comm. Expires Dec 5, 2015

Signature of Notary Public (seal)

THERESA M. VIGIL
Commission # 1962796
Notary Public - California
Sacramento County
My Comm. Expires Dec 5, 2015

EXHIBIT A

Map of Property Subject to Environmental Restrictions

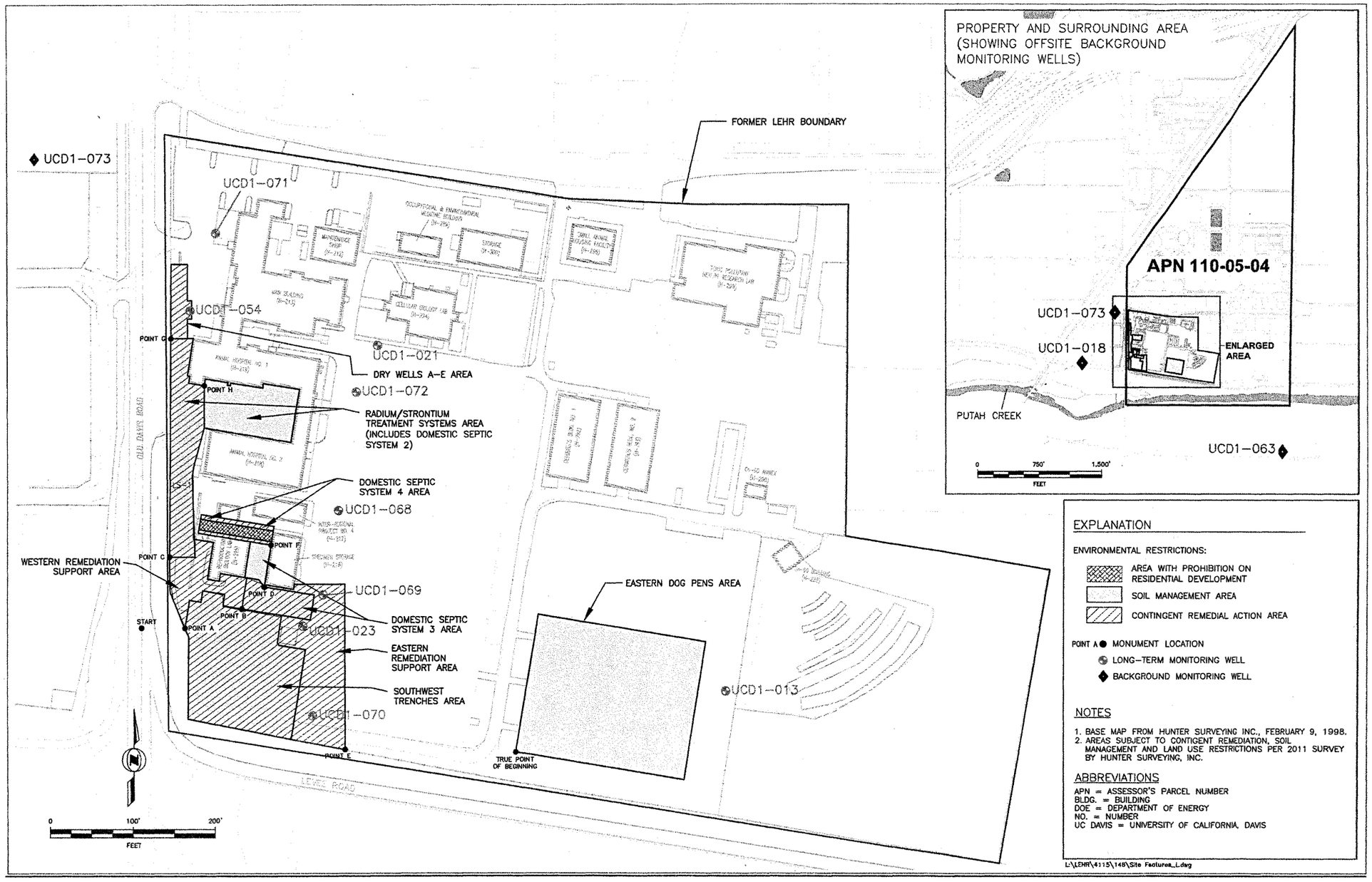

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Exhibit B

Description of Assessor's Parcel, Portions of which are Subject to Environmental Restrictions

All that certain real property situated in Solano County, California described as follows:

Solano County Assessor's Parcel Number 110-05-04 more particularly described in Quitclaim Deed recorded May 18, 1999, as Document No 1999-00042875 Official Records of said county, that includes Exhibit A comprising *Description - Hamel to UCD* and *Quitclaim Line Exhibit* prepared by Frame Surveying & Mapping,

and

shown on the attached map of parcel 110-05-04.

EXHIBIT B.1

Map of Parcel Number 110-050-04

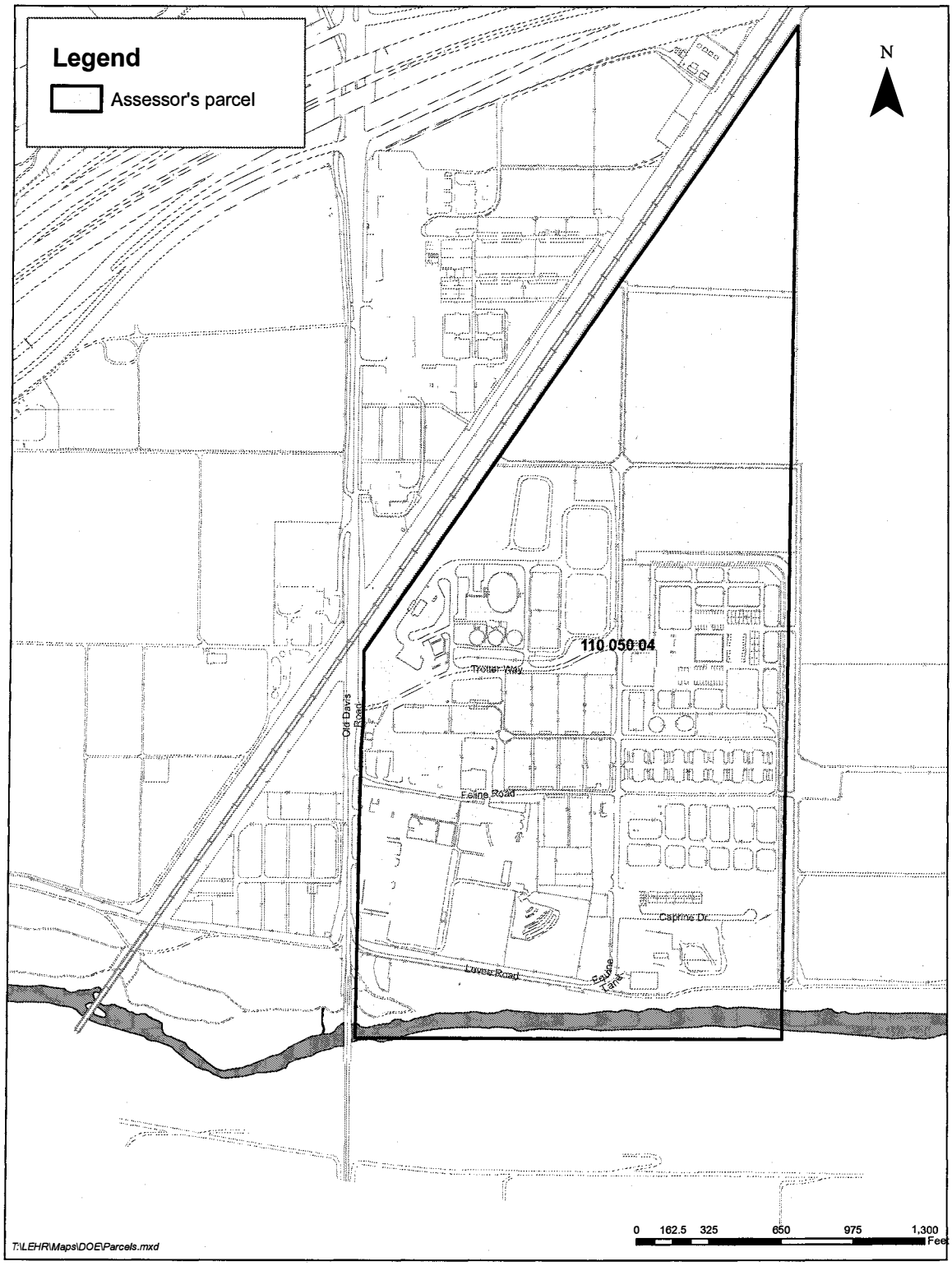


EXHIBIT C

Legal Descriptions of Areas Subject to Specific Environmental Restrictions

1. Radium / Strontium Treatment Systems Area

Exhibit C-1 Radium / Strontium Treatment Systems Area Subject to Contingent Remediation

Exhibit C-2 Radium / Strontium Treatment Systems Area Subject to Soil Management Plan

Survey Map Sheet 3 of 4

2. Domestic Septic System 3 Area

Exhibit C-3 Domestic Septic System 3 Area Subject to Contingent Remediation

Exhibit C-4 Domestic Septic System 3 Area Subject to Soil Management Plan

Survey Map Sheets 1 of 4 and 2 of 4

3. Domestic Septic System 4 Area

Exhibit C-5 Domestic Septic System 4 Area Subject to Contingent Remediation and Soil Management Plan

Exhibit C-6 Domestic Septic System 4 Area Subject to Restrictions on Land Use

Survey Map Sheets 1 of 4 and 2 of 4

4. Dry Wells A-E Area

Exhibit C-7 Dry Wells A-E Area Subject to Contingent Remediation and Soil Management Plan

Survey Map Sheet 3 of 4

5. Eastern Dog Pens Area

Exhibit C-8 Eastern Dog Pens Area Subject to Soil Management Plan

Survey Map Sheet 4 of 4

6. Southwest Trenches Area

Exhibit C-9 Southwest Trenches Area Subject to Contingent Remediation and Soil Management Plan

Survey Map Sheet 1 of 4

7. Eastern Remediation Support Area

Exhibit C-10 Eastern Remediation Support Area

Survey Map Sheet 1 of 4

8. Western Remediation Support Are

Exhibit C-11 Western Remediation Support Area

Survey Map Sheet 1 of 4

SURVEY MAPS

Site Map of Areas Subject to Specific Environmental Restrictions (pages 1 through 4)

COVENANT DESCRIPTION – EXHIBIT C-1

RADIUM / STRONTIUM TREATMENT SYSTEMS AREA
SUBJECT TO CONTINGENT REMEDIATION

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

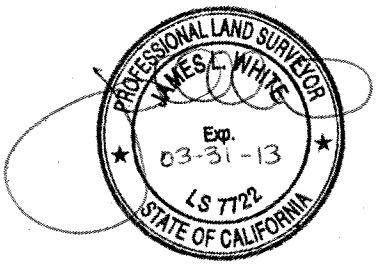
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor", from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***, thence N 22°43'48" W 46.75 feet; thence N 04°18'15" W 8.57 feet; thence N 00°10'20" W 34.24 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point C***, and the **True Point of Beginning**;

thence N 00°25'23" E 263.54 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point G***; thence East 20.30 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence continuing East 7.01 feet to the northwest corner of Building H-219; thence along the westerly and southerly lines of Building H-219 the following four courses: S 09°11'25" W 45.72 feet, S 80°48'35" E 2.99 feet, S 09°11'25" W 8.40 feet, and S 80°48'35" E 19.33 feet to a point, called ***Point H***; thence leaving Building H-219 South 50.67 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 16°02'47" W 45.75 feet; thence S 09°20'34" W 14.76 feet; thence S 01°59'38" E 97.40 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence West 31.00 feet to the true point of beginning.

Containing 8244.44 square feet (0.189 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-2

RADIUM / STRONTIUM TREATMENT SYSTEMS AREA
SUBJECT TO SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B.&M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

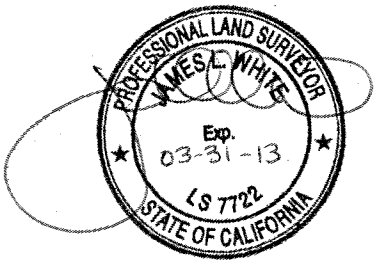
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor", from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***, thence N 22°43'48" W 46.75 feet; thence N 04°18'15" W 8.57 feet; thence N 00°10'20" W 34.24 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point C***, and the **True Point of Beginning**;

thence N 00°25'23" E 263.54 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point G***; thence East 20.30 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence continuing East 7.01 feet to the northwest corner of Building H-219; thence along the westerly and southerly lines of Building H-219 the following four courses: S 09°11'25" W 45.72 feet, S 80°48'35" E 2.99 feet, S 09°11'25" W 8.40 feet, and S 80°48'35" E 19.33 feet to a point, called ***Point H***; thence continuing along the southerly line of Building H-219 the following eight courses: N 09°11'25" E 8.40 feet, S 80°48'35" E 28.34 feet, S 09°11'25" W 3.34 feet, S 80°48'35" E 3.58 feet, N 09°11'25" E 3.34 feet, S 80°48'35" E 39.23 feet, N 09°11'25" E 5.54 feet, and S 80°48'35" E 44.41 feet; thence S 09°11'25" W along the west line of the building transition of Building H-219 to H-218 a distance of 64.27 feet; thence along the north line of Building H-218 N 80°48'35" W 99.92 feet to the northwest corner of Building H-218; thence leaving said Building H-218 N 78°25'56" W 7.54 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", from which hereinabove described Point H bears North 50.67 feet; thence S 16°02'47" W 45.75 feet; thence S 09°20'34" W 14.76 feet; thence S 01°59'38" E 97.40 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence West 31.00 feet to the true point of beginning.

Containing 15058.50 square feet (0.346 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-3

DOMESTIC SEPTIC SYSTEM 3 AREA
SUBJECT TO CONTINGENT REMEDIATION

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

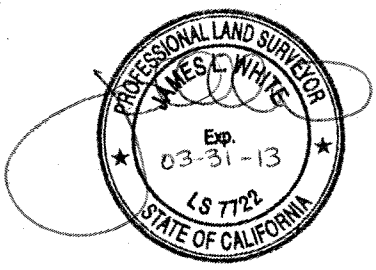
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence N 71°27'11" E 73.26 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***, and the **True Point of Beginning**;

thence N 09°11'25" E 37.90 feet; thence S 80°48'35" E 15.49 feet; thence S 35°48'35" E 10.47 feet to a point, called ***Point D***, from which hereinabove described Point B bears S 46°04'44" W 38.13 feet; thence S 80°48'35" E 61.76 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 30.50 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 80°48'35" W 35.00 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 80°48'35" W 49.65 feet to the true point of beginning.

Containing 2723.84 square feet (0.063 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-4

DOMESTIC SEPTIC SYSTEM 3 AREA
SUBJECT TO SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

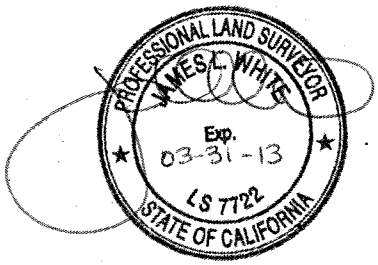
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence N 71°27'11" E 73.26 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***, and the **True Point of Beginning**;

thence N 09°11'25" E 37.90 feet; thence N 80°48'35" W 2.55 feet to the southerly terminus of the east line of Building H-215; thence along said east line of Building H-215 N 09°11'25" E 43.91 feet; thence leaving said east line S 80°48'35" E 25.44 feet to a point in the west line of Building H-216, called **Point F**; thence along said west line of Building H-216 S 09°11'25" W 48.55 feet to the southwest corner of Building H-216; thence leaving said building and continuing S 09°11'25" W 2.77 feet to a point, called ***Point D***, from which hereinabove described Point B bears S 46°04'44" W 38.13 feet; thence S 80°48'35" E 61.76 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 30.50 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 80°48'35" W 35.00 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence continuing N 80°48'35" W 49.65 feet to the true point of beginning.

Containing 3868.27 square feet (0.089 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-5

DOMESTIC SEPTIC SYSTEM 4 AREA

SUBJECT TO CONTINGENT REMEDIATION AND SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

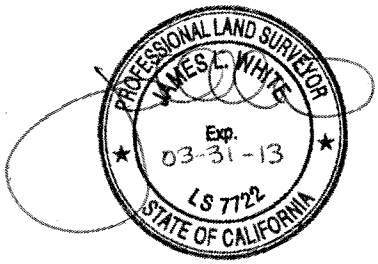
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence N 71°27'11" E 73.26 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***; thence N 46°04'44" E 38.13 feet to a point called ***Point D***; thence N 09°11'25" E 2.77 feet to the southwest corner of Building H-216; thence along the west line of said building N 09°11'25" E 48.55 feet to a point, called ***Point F***, and the **True Point of Beginning**;

thence leaving said west building line N 80°48'35" W 25.44 feet to a point in the east line of Building H-215; thence continuing N 80°48'35" W through Building H-215 a distance of 53.37 feet to a point on the west line of Building H-215; thence continuing N 80°48'35" W 11.19 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 09°11'25" E 22.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 80°48'35" E 19.77 feet to a point on the west line of Building H-215; thence continuing S 80°48'35" E through Building H-215 a distance of 44.79 feet to the most east corner of said Building H-215; thence continuing S 80°48'35" E 25.44 feet; thence along the west line of Building H-216 and its northerly projection S 09°11'25" W 22.85 feet to the true point of beginning.

Containing 2056.50 square feet (0.047 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-6

DOMESTIC SEPTIC SYSTEM 4 AREA
SUBJECT TO RESTRICTION ON LAND USE

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

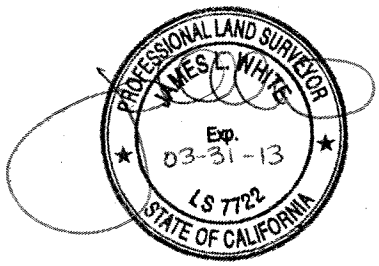
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence N 71°27'11" E 73.26 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***; thence N 46°04'44" E 38.13 feet to a point, called ***Point D***; thence N 09°11'25" E 2.77 feet to the southwest corner of Building H-216; thence along the west line of said building N 09°11'25" E 48.55 feet to a point, called ***Point F***; thence continuing along said west building line N 09°11'25" E 4.29 feet to the **True Point of Beginning**;

thence leaving said west building line N 80°48'35" W 25.44 feet to a point in the east line of Building H-215; thence continuing N 80°48'35" W through Building H-215 a distance of 53.37 feet to a point on the west line of Building H-215; thence continuing N 80°48'35" W 11.19 feet to a point, from which a 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE" bears S 09°11'25" W 4.29 feet; thence N 09°11'25" E 13.00 feet to a point, from which a 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE" bears N 09°11'25" E 5.56 feet; thence S 80°48'35" E 19.77 feet to a point on the west line of Building H-215; thence continuing S 80°48'35" E through Building H-215 a distance of 44.79 feet to a point on the east line of said Building H-215; thence continuing S 80°48'35" E 25.44 feet; thence along the west line of Building H-216 and its northerly projection S 09°11'25" W 13.00 feet to the true point of beginning.

Containing 1170.00 square feet (0.027 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-7

DRY WELLS A-E AREA

SUBJECT TO CONTINGENT REMEDIATION AND SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

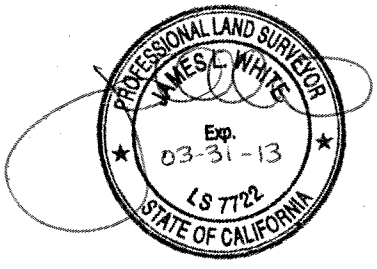
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor", from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***, thence N 22°43'48" W 46.75 feet; thence N 04°18'15" W 8.57 feet; thence N 00°10'20" W 34.24 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point C***; thence N 00°25'23" E 263.54 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point G***, and the **True Point of Beginning**;

thence East 20.30 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence North 23.47 feet; thence East 5.20 feet; thence North 22.00 feet; thence West 5.20 feet; thence North 44.00 feet; thence West 20.00 feet; thence S 00°11'32" W 89.47 feet to the true point of beginning.

Containing 1917.19 square feet (0.044 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-8

EASTERN DOG PENS AREA
SUBJECT TO SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

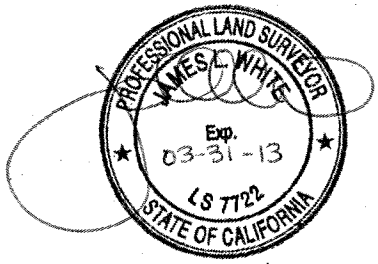
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence S 53°01'21" E 243.86 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point E***; thence S 89°07'50" E 207.70 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE" and the **True Point of Beginning**;

thence N 09°15'00" E 168.30 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 80°45'00" E 207.80 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°15'00" W 168.30 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 80°45'00" W 207.80 feet to the true point of beginning.

Containing 34972.74 square feet (0.803 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-9

SOUTHWEST TRENCHES AREA

SUBJECT TO CONTINGENT REMEDIATION AND SOIL MANAGEMENT PLAN

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

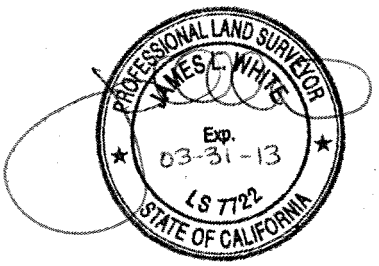
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***, and the **True Point of Beginning**;

thence N 09°11'25" E 34.10 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 80°48'35" E 14.25 feet; thence N 09°11'25" E 14.00 feet; thence S 80°48'35" E 27.50 feet; thence S 09°11'25" W 14.00 feet; thence S 80°48'35" E 23.09 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***, from which hereinabove described *Point A* bears S 71°27'11" W 73.26 feet; thence S 80°48'35" E 49.65 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S09°11'25" W 33.70 feet; thence S 35°48'35" E 3.54 feet; thence S 80°48'35" E 32.50 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 109.80 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 78°55'32" W 128.40 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 00°27'10" E 98.48 feet; thence N 21°45'41" W 12.06 feet to the true point of beginning.

Containing 19222.27 square feet (0.441 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-10

EASTERN REMEDIATION SUPPORT AREA

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

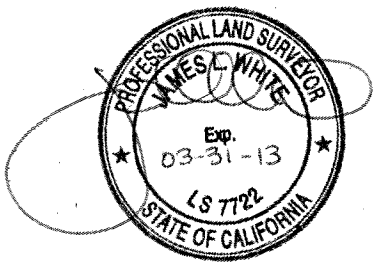
Commencing at a point in the centerline of Old Davis Road (County Road No. 79) marked by a found aluminum cap monument stamped "Solano County Surveyor," from which a found 1 1/2" brass cap in monument well, accepted as marking the intersection of Becker Road (County Road Nos. 86 and 106) and said Old Davis Road (County Road No. 79), bears S 00°22'36" W 8421.14 feet (cited in said Quitclaim Deed as S 00°23'11" W);

thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***; thence N 71°27'11" E 73.26 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***; thence N 46°04'44" E 38.13 feet to a point, called ***Point D***, and the **True Point of Beginning**;

thence S 80°48'35" E 61.76 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 30.50 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence N 80°48'35" W 35.00 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 33.70 feet; thence S 35°48'35" E 3.54 feet; thence S 80°48'35" E 32.50 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 09°11'25" W 109.80 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 79°15'54" E 66.27 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point E***, from which hereinabove described Point A bears N 53°01'21" W 243.86 feet; thence North 199.46 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence West 60.80 feet to a point in east line of Building H-216; thence along said building S 09°11'25" W 6.14 feet to the southeast corner of said building; thence along the south line of said building N 80°48'35" W 36.14 to the southwest corner of said building; thence leaving said building line S 09°11'25" W 2.77 feet to the true point of beginning.

Containing 11398.47 square feet (0.262 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.



COVENANT DESCRIPTION – EXHIBIT C-11

WESTERN REMEDIATION SUPPORT AREA

All that portion of Lot 37 Rancho Los Putos and projected Section 21, T.8N., R.2E., M.D.B. & M., County of Solano, State of California, being a portion of that certain real property described in Quitclaim Deed recorded May 18, 1999, as Document No. 1999-00042875 Official Records of said county, described as follows:

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thence along said centerline S 00°22'36" W 2693.84 feet; thence at right angles from said centerline S 89°37'24" E 52.85 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point A***, and the **True Point of Beginning**;

thence N 09°11'25" E 34.10 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence S 80°48'35" E 14.25 feet; thence N 09°11'25" E 14.00 feet; thence S 80°48'35" E 27.50 feet; thence S 09°11'25" W 14.00 feet; thence S 80°48'35" E 23.09 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point B***, from which hereinabove described *Point A* bears S 71°27'11" W 73.26 feet; thence N 09°11'25" E 37.90 feet; thence N 80°48'35" W 2.55 feet to the southerly terminus of the east line of Building H-215; thence along said Building H-215 the following four courses: N 80°48'35" W 30.01 feet, S 09°11'25" W 9.34 feet, N 80°48'35" W 14.69 feet and N 09°11'25" E 45.30 feet; thence leaving said Building H-215, N 80°45'35" W 23.47 feet; thence S 01°59'38" E 21.62 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE"; thence West 31.00 feet to a set 5/8" rebar with 2" brass cap, stamped "CERCLA Land Use Control – US DOE", called ***Point C***; thence S 00°10'20" E 34.24 feet; thence S 04°18'15" E 8.57 feet; thence S 22°43'48" E 46.75 feet to the true point of beginning.

Containing 4433.49 square feet (0.102 acres), more or less.

The foregoing description is based on the bearing between found UC Davis Control Monuments 620 to 666 as being S 81°32'47" E.

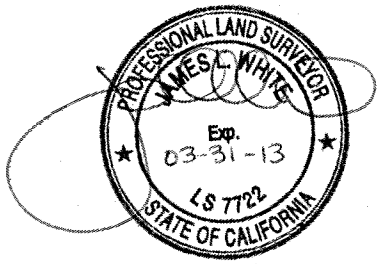


EXHIBIT C

Survey Maps of Areas Subject to Specific Environmental Restrictions

Survey Map Sheet 1 of 4

- Domestic Septic System 3 Area Subject to Contingent Remediation (Exhibit C-3)*
- Domestic Septic System 3 Area Subject to Soil Management Plan (Exhibit C-4)
- Southwest Trenches Area Subject to Contingent Remediation and Soil Management Plan (Exhibit C-9)
- Eastern Remediation Support Area (Exhibit C-10)
- Western Remediation Support Area (Exhibit C-11)

Survey Map Sheet 2 of 4

- Radium/Strontium Treatment Systems Area Subject to Contingent Remediation (Exhibit C-1)
- Domestic Septic System 3 Area Subject to Contingent Remediation (Exhibit C-3)
- Domestic Septic System 3 Area Subject to Soil Management Plan (Exhibit C-4)
- Domestic Septic System 4 Area Subject to Contingent Remediation and Soil Management Plan (Exhibit C-5)
- Domestic Septic System 4 Area Subject to Restrictions on Land Use (Exhibit C-6)
- Western Remediation Support Area (Exhibit C-11)

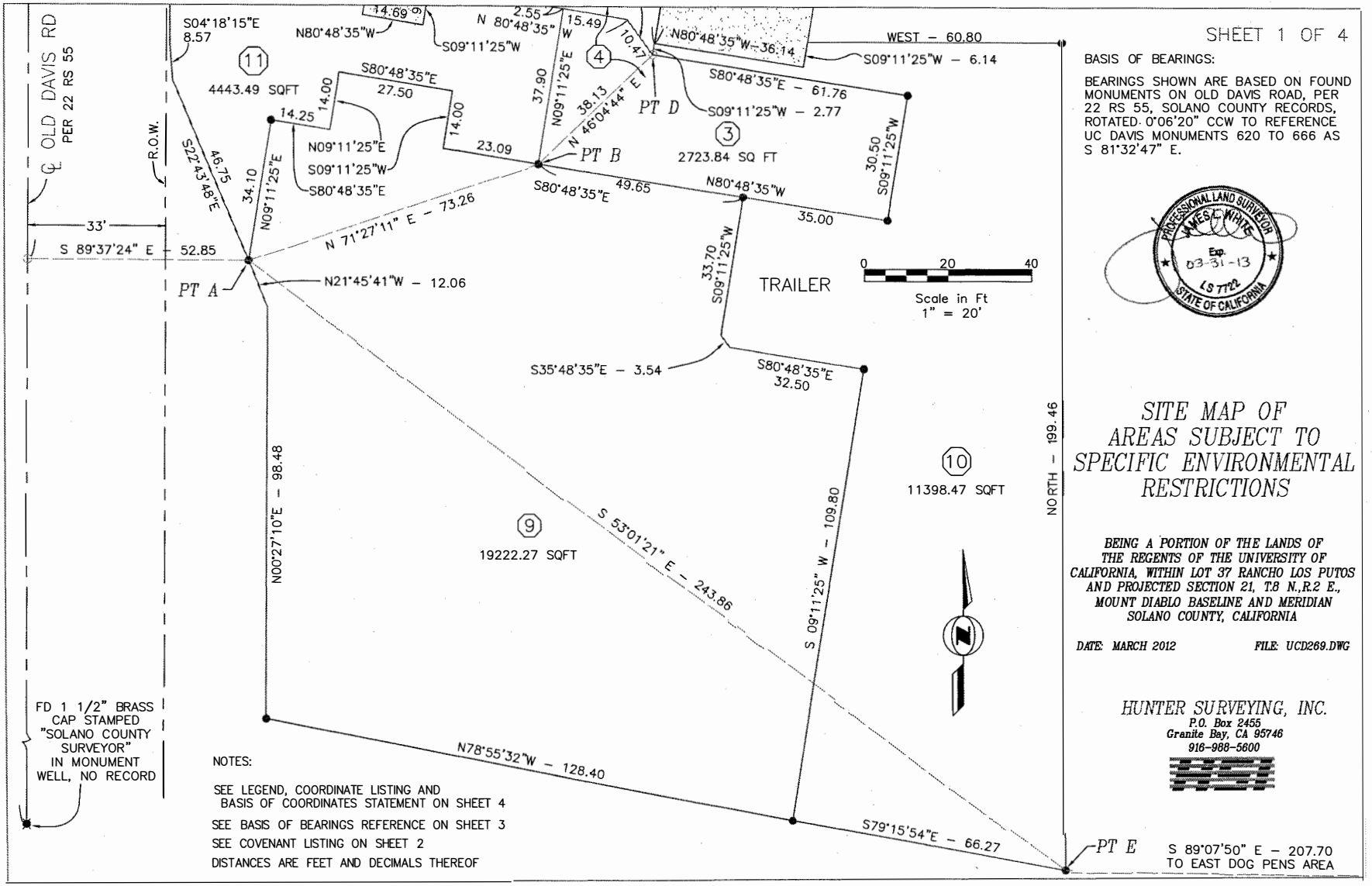
Survey Map Sheet 3 of 4

- Radium / Strontium Treatment Systems Area Subject to Contingent Remediation (Exhibit C-1)
- Radium / Strontium Treatment Systems Area Subject to Soil Management Plan (Exhibit C-2)
- Dry Wells A-E Area Subject to Contingent Remediation and Soil Management Plan (Exhibit C-7)

Survey Map Sheet 4 of 4

- Eastern Dog Pens Area Subject to Soil Management Plan (Exhibit C-8)

* Exhibit C-n corresponds to the legal descriptions.


SHEET 1 OF 4
BASIS OF BEARINGS:
BEARINGS SHOWN ARE BASED ON FOUND MONUMENTS ON OLD DAVIS ROAD, PER 22 RS 55, SOLANO COUNTY RECORDS, ROTATED 0°06'20" CCW TO REFERENCE UC DAVIS MONUMENTS 620 TO 666 AS S 81°32'47" E.
PROFESSIONAL LAND SURVEYOR JAMES A. WHITE Exp. 03-31-13 LS 7722 STATE OF CALIFORNIA
SITE MAP OF AREAS SUBJECT TO SPECIFIC ENVIRONMENTAL RESTRICTIONS
BEING A PORTION OF THE LANDS OF THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, WITHIN LOT 37 RANCHO LOS PUTOS AND PROJECTED SECTION 21, T.8 N.,R.2 E., MOUNT DIABLO BASELINE AND MERIDIAN SOLANO COUNTY, CALIFORNIA
DATE: MARCH 2012
FILE: UCD269.DWG
HUNTER SURVEYING, INC.
P.O. Box 2455
Granite Bay, CA 95746
916-988-5600
℄ OLD DAVIS RD PER 22 RS 55
R.O.W.
33'
S 89°37'24" E – 52.85
PT A
S04°18'15"E 8.57
N80°48'35"W
14.69
S09°11'25"W
N 80°48'35" W
2.55
15.49
10.47
N80°48'35"W – 36.14
WEST – 60.80
S09°11'25"W – 6.14
S80°48'35"E – 61.76
S09°11'25"W – 2.77
PT D
PT B
PT E
11
4
3
4443.49 SQFT
2723.84 SQ FT
S80°48'35"E 27.50
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14.25
N09°11'25"E
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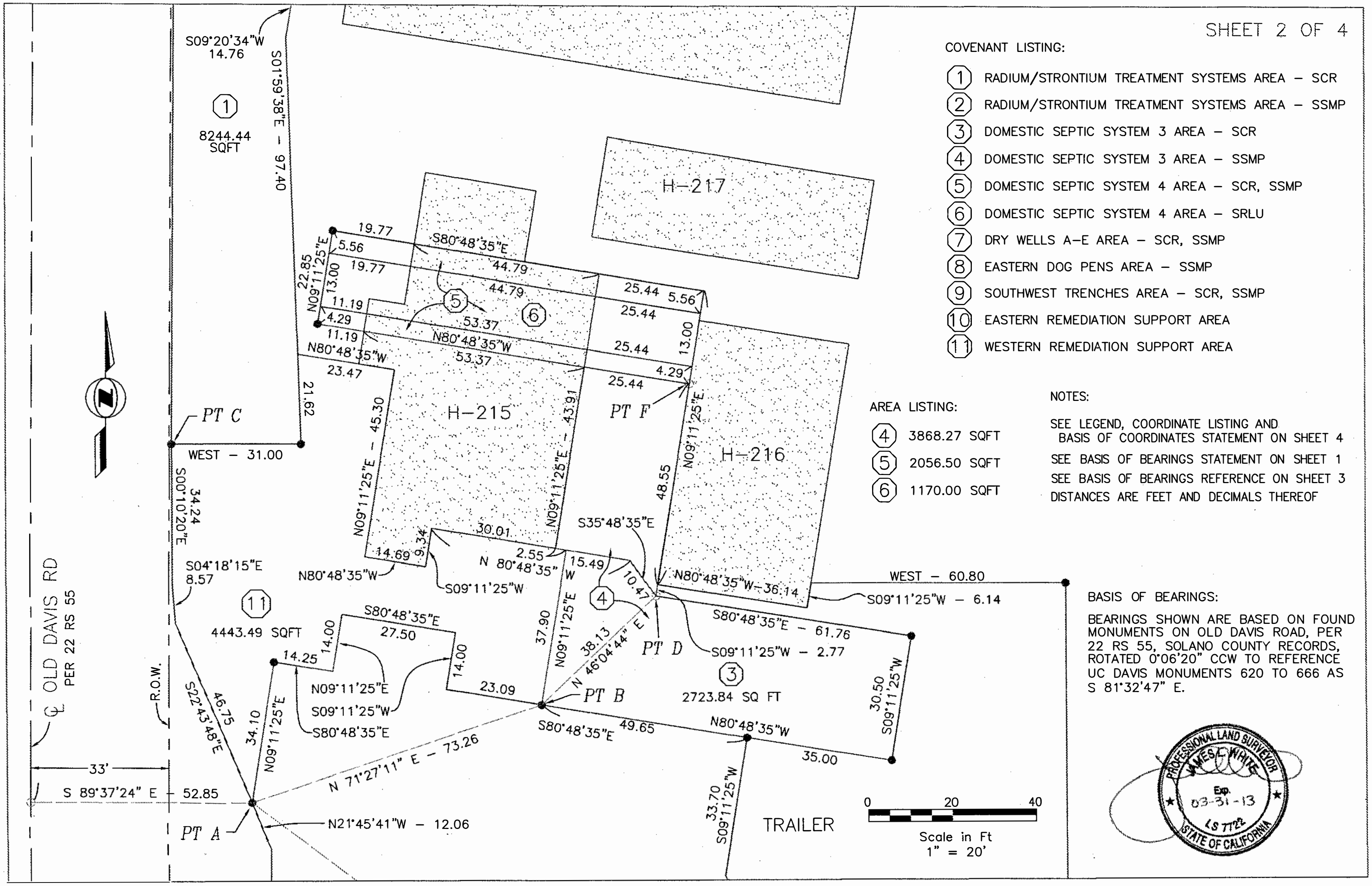
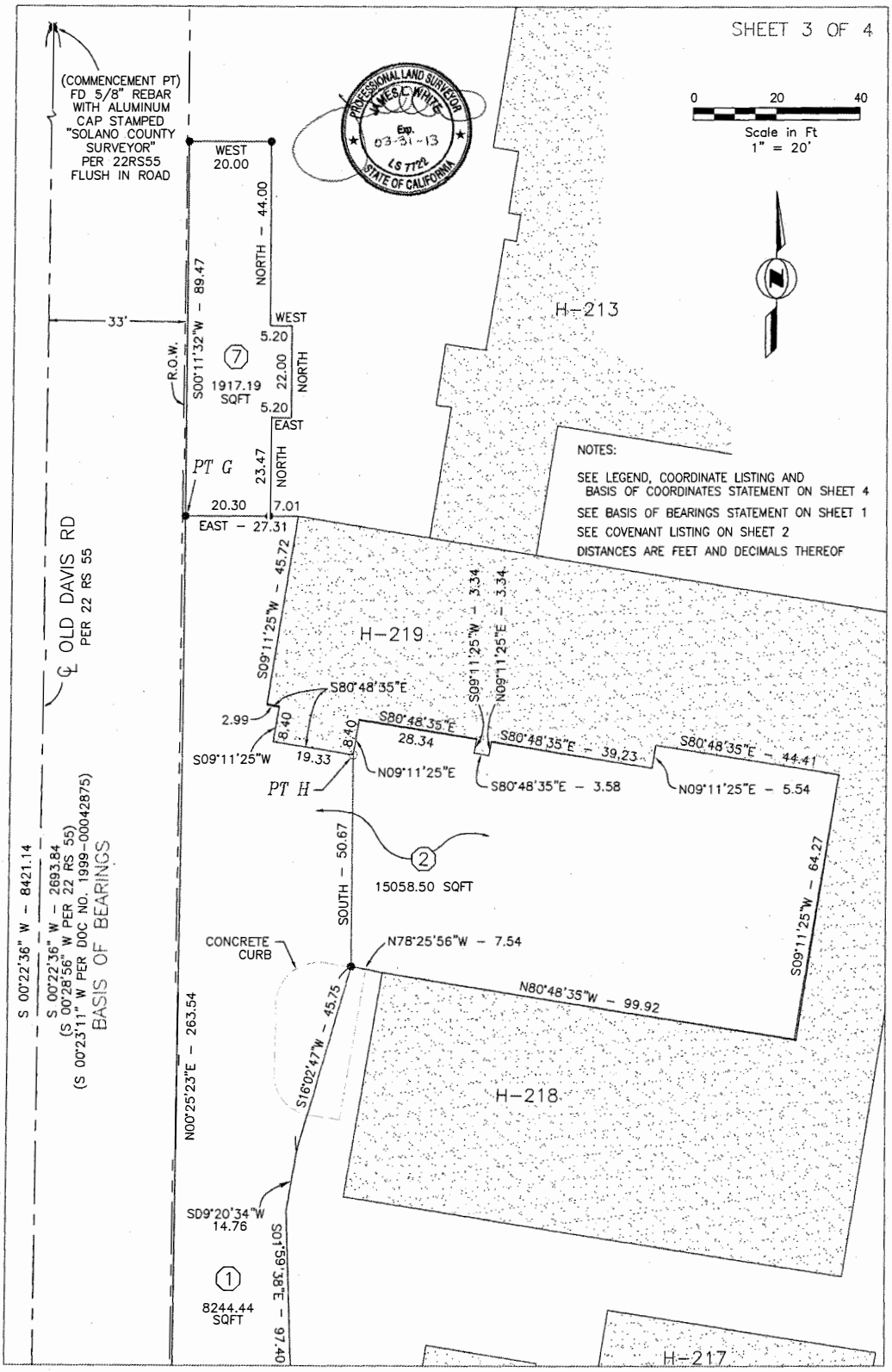
S80°48'35"E
14.00
23.09
37.90
N09°11'25"E
38.13
N 46°04'44" E
30.50
S09°11'25"W
S80°48'35"E 49.65
N80°48'35"W 35.00
46.75
S27°43'48"E
34.10
N09°11'25"E
N 71°27'11" E – 73.26
N21°45'41"W – 12.06
33.70
S09°11'25"W
TRAILER
0 20 40
Scale in Ft
1" = 20'
S35°48'35"E – 3.54
S80°48'35"E 32.50
10
11398.47 SQFT
9
19222.27 SQFT
N00°27'10"E – 98.48
S 53°01'21" E – 243.86
S 09°11'25" W – 109.80
NORTH – 199.46
N78°55'32"W – 128.40
S79°15'54"E – 66.27
S 89°07'50" E – 207.70
TO EAST DOG PENS AREA
FD 1 1/2" BRASS CAP STAMPED "SOLANO COUNTY SURVEYOR" IN MONUMENT WELL, NO RECORD
NOTES:
SEE LEGEND, COORDINATE LISTING AND BASIS OF COORDINATES STATEMENT ON SHEET 4
SEE BASIS OF BEARINGS REFERENCE ON SHEET 3
SEE COVENANT LISTING ON SHEET 2
DISTANCES ARE FEET AND DECIMALS THEREOF


SHEET 2 OF 4
COVENANT LISTING:
1 RADIUM/STRONTIUM TREATMENT SYSTEMS AREA – SCR
2 RADIUM/STRONTIUM TREATMENT SYSTEMS AREA – SSMP
3 DOMESTIC SEPTIC SYSTEM 3 AREA – SCR
4 DOMESTIC SEPTIC SYSTEM 3 AREA – SSMP
5 DOMESTIC SEPTIC SYSTEM 4 AREA – SCR, SSMP
6 DOMESTIC SEPTIC SYSTEM 4 AREA – SRLU
7 DRY WELLS A–E AREA – SCR, SSMP
8 EASTERN DOG PENS AREA – SSMP
9 SOUTHWEST TRENCHES AREA – SCR, SSMP
10 EASTERN REMEDIATION SUPPORT AREA
11 WESTERN REMEDIATION SUPPORT AREA
AREA LISTING:
4 3868.27 SQFT
5 2056.50 SQFT
6 1170.00 SQFT
NOTES:
SEE LEGEND, COORDINATE LISTING AND BASIS OF COORDINATES STATEMENT ON SHEET 4
SEE BASIS OF BEARINGS STATEMENT ON SHEET 1
SEE BASIS OF BEARINGS REFERENCE ON SHEET 3
DISTANCES ARE FEET AND DECIMALS THEREOF
BASIS OF BEARINGS:
BEARINGS SHOWN ARE BASED ON FOUND MONUMENTS ON OLD DAVIS ROAD, PER 22 RS 55, SOLANO COUNTY RECORDS, ROTATED 0°06'20" CCW TO REFERENCE UC DAVIS MONUMENTS 620 TO 666 AS S 81°32'47" E.
H-215
H-216
H-217
TRAILER
OLD DAVIS RD
PER 22 RS 55
R.O.W.
PT A
PT B
PT C
PT D
PT F
8244.44 SQFT
4443.49 SQFT
2723.84 SQ FT
S09°20'34"W 14.76
S01°59'38"E – 97.40
WEST – 31.00
WEST – 60.80
S00°10'20"E 34.24
S04°18'15"E 8.57
S22°43'48"E 46.75
S 89°37'24" E – 52.85
N21°45'41"W – 12.06
N 71°27'11" E – 73.26
N 46°04'44" E 38.13
S35°48'35"E
S09°11'25"W – 6.14
S09°11'25"W – 2.77
S80°48'35"E – 61.76
N80°48'35"W – 36.14
N80°48'35"W
S80°48'35"E
N09°11'25"E
S09°11'25"W
33'
Scale in Ft
1" = 20'
0 20 40
PROFESSIONAL LAND SURVEYOR
JAMES L. WHITE
Exp. 03-31-13
LS 7722
STATE OF CALIFORNIA


SHEET 3 OF 4
0 20 40
Scale in Ft
1" = 20'
PROFESSIONAL LAND SURVEYOR
JAMES C. WHITE
Exp. 03-31-13
LS 7722
STATE OF CALIFORNIA
(COMMENCEMENT PT)
FD 5/8" REBAR
WITH ALUMINUM
CAP STAMPED
"SOLANO COUNTY
SURVEYOR"
PER 22RS55
FLUSH IN ROAD
WEST
20.00
NORTH - 44.00
WEST
5.20
NORTH
22.00
5.20
EAST
NORTH
23.47
PT G
20.30
7.01
EAST - 27.31
S00°11'32"W - 89.47
33'
R.O.W.
7
1917.19
SQFT
H-213
NOTES:
SEE LEGEND, COORDINATE LISTING AND
BASIS OF COORDINATES STATEMENT ON SHEET 4
SEE BASIS OF BEARINGS STATEMENT ON SHEET 1
SEE COVENANT LISTING ON SHEET 2
DISTANCES ARE FEET AND DECIMALS THEREOF
℄ OLD DAVIS RD
PER 22 RS 55
S 00°22'36" W - 8421.14
S 00°22'36" W - 2693.84
(S 00°28'56" W PER 22 RS 55)
(S 00°23'11" W PER DOC NO. 1999-00042875)
BASIS OF BEARINGS
H-219
S09°11'25"W - 45.72
S09°11'25"W - 3.34
S09°11'25"E - 3.34
N09°11'25"E
S80°48'35"E
2.99
8.40
S80°48'35"E
28.34
S80°48'35"E - 39.23
S80°48'35"E - 44.41
S09°11'25"W
19.33
8.40
N09°11'25"E
PT H
S80°48'35"E - 3.58
N09°11'25"E - 5.54
2
15058.50 SQFT
SOUTH - 50.67
S09°11'25"W - 64.27
CONCRETE
CURB
N78°25'56"W - 7.54
N80°48'35"W - 99.92
S16°02'47"W - 45.75
H-218
N00°25'23"E - 263.54
S09°20'34"W
14.76
S01°59'38"E - 97.40
1
8244.44
SQFT
H-217

SHEET 4 OF 4

LEGEND:

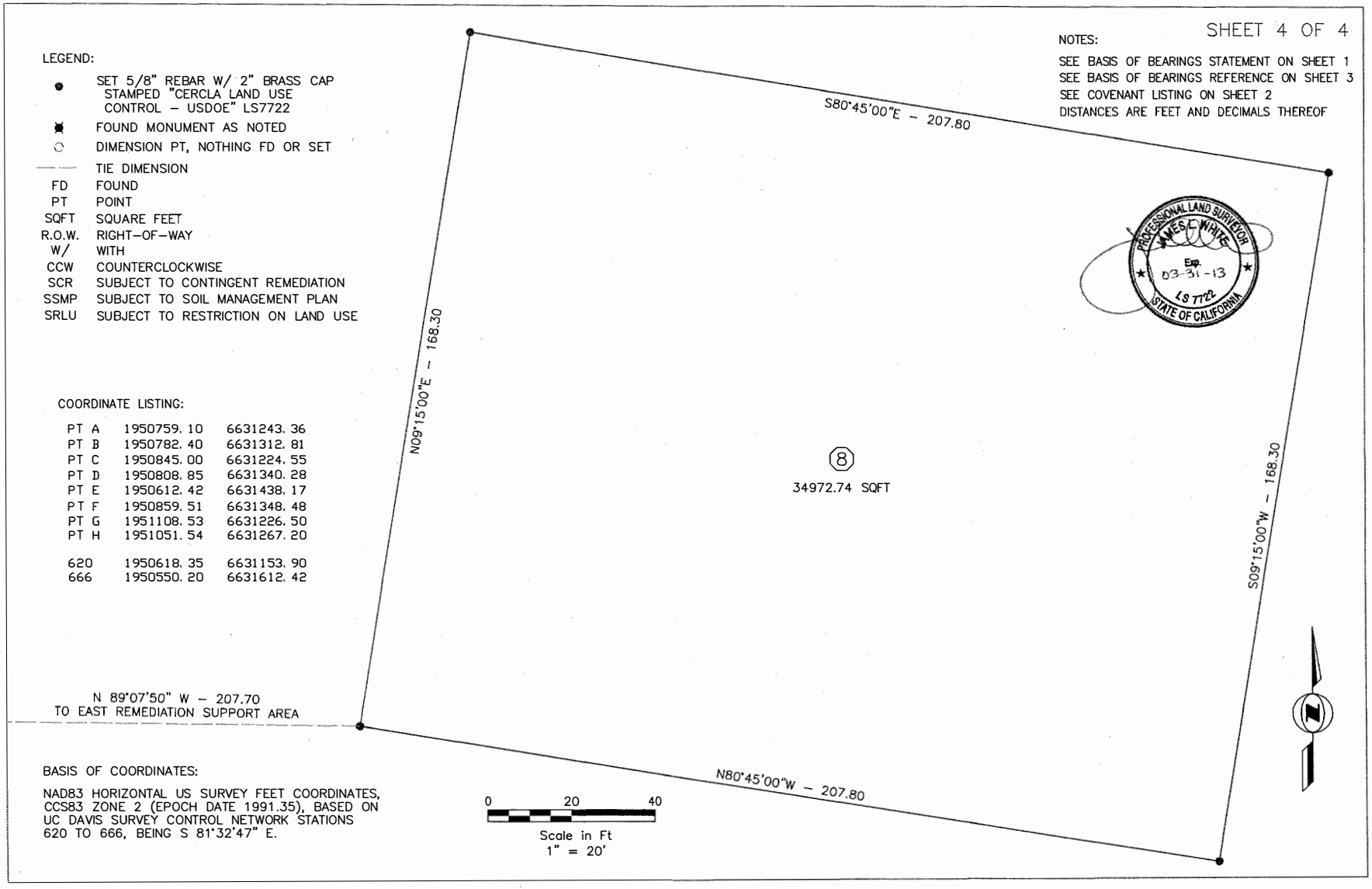
●	SET 5/8" REBAR W/ 2" BRASS CAP STAMPED "CERCLA LAND USE CONTROL – USDOE" LS7722
✱	FOUND MONUMENT AS NOTED
○	DIMENSION PT, NOTHING FD OR SET
———	TIE DIMENSION
FD	FOUND
PT	POINT
SQFT	SQUARE FEET
R.O.W.	RIGHT–OF–WAY
W/	WITH
CCW	COUNTERCLOCKWISE
SCR	SUBJECT TO CONTINGENT REMEDIATION
SSMP	SUBJECT TO SOIL MANAGEMENT PLAN
SRLU	SUBJECT TO RESTRICTION ON LAND USE

NOTES:

SEE BASIS OF BEARINGS STATEMENT ON SHEET 1
SEE BASIS OF BEARINGS REFERENCE ON SHEET 3
SEE COVENANT LISTING ON SHEET 2
DISTANCES ARE FEET AND DECIMALS THEREOF

COORDINATE LISTING:

PT A	1950759.10	6631243.36
PT B	1950782.40	6631312.81
PT C	1950845.00	6631224.55
PT D	1950808.85	6631340.28
PT E	1950612.42	6631438.17
PT F	1950859.51	6631348.48
PT G	1951108.53	6631226.50
PT H	1951051.54	6631267.20
620	1950618.35	6631153.90
666	1950550.20	6631612.42



BASIS OF COORDINATES:

NAD83 HORIZONTAL US SURVEY FEET COORDINATES, CCS83 ZONE 2 (EPOCH DATE 1991.35), BASED ON UC DAVIS SURVEY CONTROL NETWORK STATIONS 620 TO 666, BEING S 81°32'47" E.

Appendix C

Sample Collection Procedures

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C1.0 Sampling Methods

Monitoring well samples will be collected according to SOP 9.3, "Low-Flow Ground Water Sampling." A sample-preparation area will be established adjacent to the well location. The work surface will be covered with plastic sheeting to minimize the potential spread of contamination. The following equipment will be staged in the sample-preparation area:

- A spill kit
- Personal protective equipment
- Sample containers
- A decontamination station
- Low-flow pump controller
- Flow-through cell multimeter
- Water level meter
- A wastewater drum
- Custody seals
- Chain-of-custody forms
- Coolers with ice

The groundwater samples will be collected following EPA guidance for low-flow groundwater sampling (EPA 1996), including monitoring for specific conductance, pH, oxidation-reduction potential, dissolved oxygen, and turbidity, until all are within the stabilization goals for three consecutive readings. The stabilization goals are as follows:

- **Specific conductance, oxidation-reduction potential, dissolved oxygen, and turbidity:** ±10%
- **pH:** ±0.2

Well purging and groundwater sample collection will be performed with dedicated bladder pumps or similar pumps suitable for low-flow purging. Sampling containers, field filtration, preservation methods (if any), and holding times will be as specified in Table C-1. All purge water and decontamination water generated during sampling will be disposed of through the campus wastewater treatment plant.

Table C-1. Analytical Parameters for Groundwater Samples

Parameter	Method Reference	Container	Sample Handling/ Preservation	Holding Time	Reporting Limit[a]	Background Level[j]	MCL[k]
Metals							
Aluminum	SW-846, Method 6020[b]	250-milliliter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	50 µg/L	5.86 µg/L[l]	1000 µg/L
Chromium (total)					1 µg/L	43.7 µg/L	50 µg/L
Iron					50 µg/L	502 µg/L	NA
Manganese					1 µg/L	10 µg/L	NA
Molybdenum					1 µg/L	3.13 µg/L	NA
Nickel					1 µg/L	141 µg/L	100 µg/L
Selenium					1 µg/L	1.74 µg/L	50 µg/L
Silver					1 µg/L	<1 µg/L	NA
Zinc					5 µg/L	20.9 µg/L	NA
Mercury	SW-846, Method 7470A[b]	250-milliliter polyethylene plastic	Filter[i], nitric acid, pH <2	28 days	0.2 µg/L	0.0479 µg/L[l]	2 µg/L
Hexavalent chromium	SW-846, Method 7199[b]	250-milliliter polyethylene plastic	Filter[i], 4 °C	24 hours	1 µg/L	40 µg/L	50 µg/L
Radionuclides							
Americium-241	EML HASL 300Am[c]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	<0.71pCi/L	15 pCi/L
Gross beta	EPA 900.0	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	3 pCi/L	2.88 pCi/L[l]	4 millirem/year
Cesium-137	EPA Method 901.1[d]	2-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	5 pCi/L	<5 pCi/L	200 pCi/L[m]
Strontium-90	EPA Method 905.0[e]	2-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	<1 pCi/L	8 pCi/L[m]
Carbon-14	EPA EERF C-01[f]	1-liter polyethylene plastic	4 °C	180 days	7 pCi/L	<7 pCi/L	2000 pCi/L[m]
Radium-226	EPA Method 903.1[g]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	1.17 pCi/L	5 pCi/L
Uranium-238	EML HASL 300U[c]	1-liter polyethylene plastic	Filter[i], nitric acid, pH <2	180 days	1 pCi/L	0.946 pCi/L[l]	20 pCi/L
General							
Nitrate (as nitrogen)	EPA Method 300.0[h]	250-milliliter polyethylene plastic	4 °C	48 hours	0.1 mg/L	15 mg/L	10 mg/L

Table C-1. Analytical Parameters for Groundwater Samples (continued)

Parameter	Method Reference	Container	Sample Handling/ Preservation	Holding Time	Reporting Limit[a]	Background Level[j]	MCL[k]
Formaldehyde	SW-846, Method 8315A[b]	1-liter amber glass	4 °C	72 hours	50 µg/L	13 µg/L[l]	NA
Organics							
1,1-Dichloroethane	SW-846, Method 8260B[b]	3 each 40-milliliter VOA glass	hydrochloric acid, pH <2, 4 °C	14 days	0.5 µg/L	0 µg/L	5 µg/L
Benzene					0.5 µg/L	0 µg/L	1 µg/L
Chloroform					0.5 µg/L	0 µg/L	80 µg/L
Chlordane	SW-846, Method 8081A[b]	1-liter amber glass (2 each)	4 °C	7 days to extraction, 40 days to analysis	0.1 µg/L	0 µg/L	0.1 µg/L
Dieldrin					0.05 µg/L	0 µg/L	NA

Notes:

[a] As shown, reporting limits are at or below MCLs for all constituents and at or below background levels for all inorganics except ^{241}Am. Reporting limits are above background levels for aluminum, mercury, gross beta, ^{238}U, and formaldehyde because background levels for these constituents are based on trace detections below the reporting limit.

[b] From the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA 2015b).

[c] From *The Procedures Manual of the Environmental Measurements Laboratory* (DOE 1997).

[d] "Gamma Emitting Radionuclides" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[e] "Radioactive Strontium" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[f] EPA, Eastern Environmental Radiation Facility.

[g] "Radium-226: Radon Emanation Technique" from *Prescribed Procedures for Measurement of Radioactivity in Drinking Water* (EPA 1980).

[h] *Determination of Inorganic Anions by Ion Chromatography* (EPA 1993).

[i] Glass fiber, 0.45-micrometer filter.

[j] Background levels determined according to RD/RAWP procedures (DOE 2010) using 2011 and 2012 groundwater monitoring program data. Although additional background data were collected in 2016 and 2017, background updates were deferred as discussed in the second paragraph of Section 3.0.

[k] Lower of California or federal primary MCLs.

[l] Background level is trace concentration (detected below the reporting limit).

[m] Beta/photon emitter derived activity yielding a dose of 4 millirem per year as defined in *National Bureau of Standards Handbook 69* (DOC 1963).

Abbreviations:

Am = americium
EERF = Eastern Environmental Radiation Facility
EML = Environmental Measurements Laboratory
MCL = maximum contaminant level
µg/L = micrograms per liter
mg/L = milligrams per liter
NA = not available
pCi/L = picocuries per liter
U = uranium
VOA = volatile organics analysis

C2.0 Sample Documentation

The usability of the data will depend on the data's quality. Following proper procedures for both sample collection and sample analysis reduces sampling and analytical error. To ensure sample integrity, samples will be handled using complete chain-of-custody documentation and preserved using proper sample preservation techniques, holding times, and shipment methods. Obtaining valid and comparable data also requires adequate quality assurance and quality control procedures and documentation.

The components of the sample documentation and custody system will include the following:

- The chain of custody
- The field logbook
- Sample numbers
- Sample labels
- Custody seals

C2.1 Chain-of-Custody

Members of the sample team will complete chain-of-custody forms to track sample custody and to specify the requested analyses.

C2.2 Field Records

Descriptions and observations made during field sampling activities will be documented in the *Water Sampling Data Sheets* (Attachment 6.2 of SOP 1.2), *Field Activity Daily Log Sheets* (Attachment 6.1 of SOP 1.2), and *Test Equipment List and Calibration Log* (Attachment 6.1 of SQP 8.1) in the field work protocol package. The following will be recorded in the field work protocol forms:

- Project name and number
- Site location
- Purpose of the sampling
- Description of field activities
- Names of sampling personnel
- Date and time of entries
- Date and time the sample was collected
- Sample location and ID number
- Sampling method
- Field observations
- Results of field measurements
- Results of field instrument calibrations

The completed forms are scanned and stored in the project directory, and the original forms are filed in the project folders.

C2.2.1 Sample ID Numbers

All samples will be assigned a unique sample ID number (i.e., sample designation), using the following format:

GWDOEXXXX

where:
GWDOE = groundwater sample associated with the DOE area
XXXX = chronological sample number (e.g., 0017, 0018, 0019)

C2.2.2 Sample Labels

Sample labels will be attached to individual sample containers and will contain the following information:

- Project number
- Sample ID number
- Date and time the sample was collected
- Sampler's initials
- Requested analyses

C2.2.3 Custody Seals

Custody seals will be used to detect tampering and will be placed over the lid of the container and annotated with the following information:

- Project number
- Sample ID number
- Date and time the sample was collected

A custody seal shall not be placed over a volatile organic analysis vial septum.

C2.3 Data Validation and Compilation

The analytical laboratories are contracted to deliver detailed analytical reports, including calibration data and raw data from the analysis of primary samples and quality control samples, sufficient for the reconstruction of all sample results. The project chemist or a designee who meets the qualifications requirements stated in the QAPP will validate the analytical results in accordance with data validation procedures defined in the QAPP. Once validated, the data will be transferred to the project database in accordance with procedures described in the QAPP.

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