ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-04

Purpose: Mound Site Plume Treatment System (MSPTS) Reconfiguration Conceptual Approach

Contact Record Approval Date: July 8, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, George Squibb, Linda Kaiser, David Ward, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: May 20, 2015

Consultation Meeting Participants: Carl Spreng, CDHPE; Vera Moritz, EPA; Scott Surovchak, DOE; Linda Kaiser, SN3; David Ward, SN3; John Boylan, SN3; George Squibb, SN3

Introduction: The existing MSPTS includes a groundwater collection trench, treatment components, and a subsurface discharge gallery. Groundwater collected in the trench gravity flows through two plastic treatment cells (approximately 10 feet in diameter and 11.5 feet tall) filled with zero-valent iron (ZVI) media. The ZVI is obtained from a source in Detroit, Michigan, and is trucked to the site for installation. Periodic spent-media removal and replacement is costly and labor intensive and requires the use of heavy construction equipment. The most recent MSPTS media replacement was performed in 2010–2011, and based on historical operations of the MSPTS, routine media replacement is required approximately every 4–5 years. Routine maintenance to remove the existing spent ZVI was planned for calendar year 2015.

Because the MSPTS system effluent typically contains one or more volatile organic compound (VOC) constituents at levels above *Rocky Flats Legacy Management Agreement* (RFLMA) standards, the RFLMA Parties have consulted on ways to optimize treatment to further reduce the potential VOC contaminant load to surface water (RFLMA Contact Record [CR] 2010-07, dated November 2, 2010). A solar-powered pump was installed in the existing MSPTS effluent manhole to circulate water from the bottom of the manhole through a spray nozzle (also situated within the effluent manhole) to further treat the effluent using the air-stripping process (RFLMA CR 2011-01, dated January 14, 2011). This has been extremely effective, but requires significant maintenance to keep the treatment effectiveness high, and even then at least one VOC typically exceeds the corresponding RFLMA Table 1 value.

The positive results of the MSPTS effluent manhole air stripper eventually led DOE to install a commercial air stripper, adapted to the existing solar/battery power facility, at the East Trenches Plume Treatment System (ETPTS) to replace the ZVI treatment media in 2014 (RFLMA CR 2012-02, dated October 16, 2012; RFLMA CR 2014-01, dated January 21,2014; and RFLMA CR 2014-04, dated February 19, 2014). Following completion of the air-stripper installation in January 2015, concentrations of VOCs in ETPTS effluent have met all corresponding RFLMA Table 1 standards.

Information on the status of operation and performance of the MSPTS and ETPTS air strippers is provided in RFLMA quarterly and annual site surveillance and maintenance reports. RFLMA contact records and site surveillance and maintenance reports are available on the Rocky Flats public website at http://www.lm.doe.gov/rocky_flats/Sites.aspx.

Discussion: While in planning to remove the spent ZVI media at the MSPTS, DOE also evaluated the potential for the addition of a commercially available air stripper unit to eliminate the use of ZVI media at this treatment system, as was accomplished at the ETPTS. Included in the evaluation was a more cost-effective option to treat the MSPTS influent in the ETPTS air stripper. The manufacturer of the commercial air stripper installed at the ETPTS modeled treatment using the ETPTS air stripper to treat the combined influent from both the MSPTS and ETPTS. The model results indicate that the MSPTS influent could be added to ETPTS influent and the combined influent could be treated by the ETPTS air stripper to meet stream standards.

A conceptual approach has been developed and discussed among the RFLMA parties. This approach includes routing the MSPTS influent to the ETPTS air stripper; see Figure 1. The existing MSPTS tanks will initially be maintained and modified for optional water storage. The existing MSPTS effluent manhole will be replaced with a lift station and pump; water collected by the MSPTS will be pumped from this lift station to the ETPTS influent manhole. The combined MSPTS and ETPTS influents would then flow to the ETPTS influent tank and be pumped to the ETPTS air stripper in batches, just as is currently done with ETPTS influent alone. Additional solar power, piping, valves, instrumentation, and other necessary components would be installed to support this approach. Minor modifications to RFLMA Attachment 2 to reflect changes in MSPTS effluent and performance sampling locations have also been identified.

Based on DOE's evaluation of the combined MSPTS and ETPTS influent VOC concentration and flow rate, the amounts and types of VOCs that the air stripper will volatilize to the air will meet Colorado Air Quality Control Regulations exemption criteria for Air Pollutant Emission Notice (APEN) reporting thresholds and permitting.

The following minor modifications to RFLMA Attachment 2 are required for the MSPTS reconfiguration and one additional updating modification. Modifications to tables and figures are summarized:

1. Table 2, "Water Monitoring Locations and Sampling Criteria," for the Mound Site Plume and Treatment System (MSPTS): rename rows for sampling locations MOUND R2-E (MSPTS effluent location) to MSETEF and GS10 (MSPTS performance location) to POM2; and for the East Trenches Plume and Treatment System (ETPTS), rename ET

EFFLUENT (ETPTS effluent location) to MSETEF to reflect the combined influents being treated.

2. Figure 1, "Water Monitoring at Rocky Flats: RFLMA," sampling location MOUND R2-E will be relocated to the previous ET EFFLUENT location and renamed MSETEF, and sampling location ET EFFLUENT will be renamed MSETEF.

3. Figure 11, "Groundwater Treatment Systems," in Note 5, "Effluent locations," rename R2-E to MSETEF and ET EFFLUENT to MSETEF; and in Note 6, "Performance locations," change GS10 to POM2.
4. Figure 2, "Composite Plume Map", update to reflect changes in Site base features.

Resolution: It was agreed that DOE will prepare engineering designs for treating the MSPTS influent using the ETPTS air stripper. The RFLMA parties will consult in a timely manner on proceeding with the MSPTS reconfiguration to allow further planning and implementation as part of the MSPTS ZVI media removal project. Approval of the reconfiguration and of any required Soil Disturbance Review Plan for the work will be documented in a subsequent contact record.

Closeout of Contact Record: This contact record will be closed when consultation on the MSPTS reconfiguration project engineering design is completed and the minor modifications to RFLMA Attachment 2 are approved.

Contact Record Prepared by: David Ward

Distribution:
Carl Spreng, CDPHE
Vera Moritz, EPA
Scott Surovchak, DOE
Linda Kaiser, SN3
Rocky Flats Contact Record File

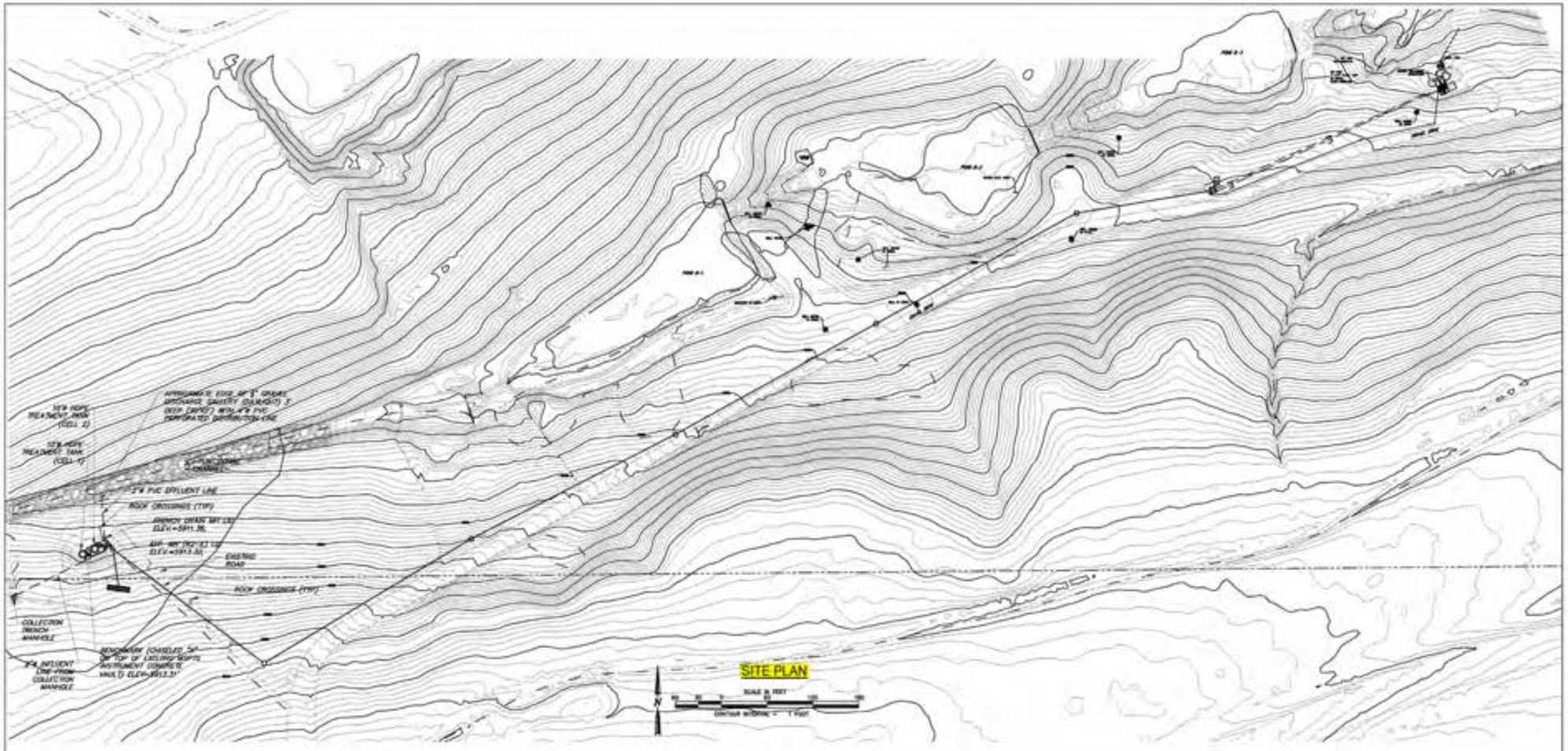
SITE PLAN
N
DRAFT
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO
S.M. Stoller Corporation
ROCKY FLATS SITE
JEFFERSON COUNTY, CO
MSPTS RECONFIGURATION 2015
MSPTS SITE PLAN

Figure 1

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-05

Purpose: Reportable condition for plutonium 12-month rolling average at Point of Evaluation (POE) SW027

Contact Record Approval Date: July 8, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); George Squibb, Kurt Franzen, Linda Kaiser, David Ward, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: June 23, 2015

Consultation Meeting Participants: Carl Spreng, CDHPE; Vera Moritz, EPA; Scott Surovchak, DOE; Kurt Franzen, David Ward, John Boylan, Linda Kaiser, George Squibb, SN3; Michelle Hanson, Jody Nelson, J.G. Management Systems, Inc.

Discussion: This Contact Record documents DOE's consultation with CDPHE and EPA on June 23, 2015, regarding the evaluation of elevated concentrations of plutonium at POE SW027, which resulted in a reportable condition under RFLMA Attachment 2, "Legacy Management Requirements," Section 6.0, "Action Determinations."

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A reportable condition was determined on June 11, 2015, based on evaluation of recently available validated analytical results for plutonium (Pu-239,240) from the composite samples collected during the period May 7, 2014–May 8, 2015. Americium (Am-241) is not reportable at this time. Following is a synopsis of the data:

No samples collected 5/7/14–3/8/15 due to lack of flow

Composite 3/9/15–3/11/15; Pu = 0.116 pCi/L, Am = 0.030 pCi/L

Composite 3/11/15–4/17/15; Pu = 0.139 pCi/L, Am = 0.030 pCi/L

Composite 4/17/15–5/6/15; Pu = 0.251 pCi/L, Am = 0.040 pCi/L

Composite 5/6/15–5/9/15; Pu = 1.02 (duplicate = 0.754) pCi/L, Am = 0.18 (duplicate = 0.157) pCi/L

The evaluation was performed in accordance with RFLMA Attachment 2, Figure 6, Points of Evaluation, which resulted in 12-month rolling average values of 0.037 pCi/L Am and 0.22 pCi/L Pu on April 30, 2015. The applicable RFLMA Table 1 standard for Am and Pu is 0.15 pCi/L.

Flow-through operations at Pond C-2 were initiated on November 7, 2011. The recent Pu and Am results from downstream location GS31 (Pond C-2 outlet) are higher than normal. Results from the downstream Point of Compliance WOMPOC (Woman Creek at COU boundary) have been received through May 17, 2015; all results were below the RFLMA Table 1 standard of 0.15 pCi/L and in fact below 0.09 pCi/L.

While the 12-month rolling average for Am is not reportable, the evaluation of the reportable Pu values will include consideration of the Am results.

Pursuant to RFLMA Attachment 2, Section 6.0, for a reportable condition:

- DOE must inform the RFLMA regulators and stakeholders identified in RFLMA Attachment 2, Figure 6 within 15 days of receipt of validated data for the reportable condition.
- DOE must submit a plan and schedule for an evaluation to address the condition within 30 days of receiving the validated data for the reportable condition.
- DOE will consult with CDPHE and EPA to determine if mitigating actions are necessary.
- The objective of consultation will be to determine a course of action (if determined necessary) to address the reportable condition and to ensure that the remedy remains protective.
- Results of consultation will be documented in Contact Records, written correspondence, or both.

The RFLMA parties have been kept informed of the elevated levels since the initial results were received, and a public-information e-mail was sent to the stakeholders on June 18, 2015.

This Contact Record describes the plan and schedule to address the reportable condition. The plan and schedule for evaluation and the status of actions related to the plan are described below:

- Evaluation of the steps taken in 2010 when it was anticipated the 12-month rolling average for plutonium would exceed the standard at SW027 as reported in CR 2010-06. This includes a review of “Report of Steps Taken Regarding Monitoring Results at Surface Water Point of Evaluation (POE) SW027,” August 31, 2010, and “Calendar Year (CY) 2011 Status Report of Actions Taken in Point of Evaluation SW027 Drainage,” January 2012.
- On June 17, 2015, Rocky Flats personnel walked the SID drainage area and identified opportunities to enhance the revegetation and erosion controls previously implemented in 2010 and 2011 (Figure 1). Also during the June 17 inspection, limited areas in the SID showed evidence of local erosion and/or sediment deposition. Based on these general observations, a geotechnical engineer was scheduled to inspect the areas and provide recommendations.
- During the June 17 inspection, locations were identified for immediate installation of new wattles (Figure 2); installation was completed on June 22, 2015.

- Additional erosion control methods will be installed in the SW027 drainage, predominantly on the hillside above GS51. These measures will include matting, wattles, GeoRidge berms, and organic mulch. Several areas in the SID will also receive erosion matting; other longer-term actions for the SID are dependent on recommendations from the geotechnical engineer. Figure 3 shows the planned locations for these measures; final locations will be documented after installation. This work is scheduled to be completed by August 2015.
- On June 29, 2015, geotechnical engineers, CDPHE, and Rocky Flats personnel walked down the SID to evaluate potential use of water and sediment management devices or structures. The geotechnical engineers will provide recommendations for water and sediment management in the SID. These recommendations will be implemented in the longer term as appropriate.
- Sampling will continue as currently scheduled when surface water runoff is available.
- Status of the above items will be reported in quarterly and annual reports or both, depending when the activities occur.

Resolution: Carl Spreng, CDPHE, will review the above plan and schedule to address this reportable condition and, after consulting with EPA, may approve, approve with modifications, or disapprove this Contact Record.

Closeout of Contact Record: This Contact Record will be closed when the proposed erosion and water management control methods have been implemented and revegetation is complete.

Contact Record Prepared by: Jody Nelson, J.G. Management Systems, Inc.; David Ward, George Squibb, Kurt Franzen, SN3

Distribution:
Carl Spreng, CDPHE
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Rocky Flats Contact Record File

Figure 1.

Figure 2. June 17, 2015

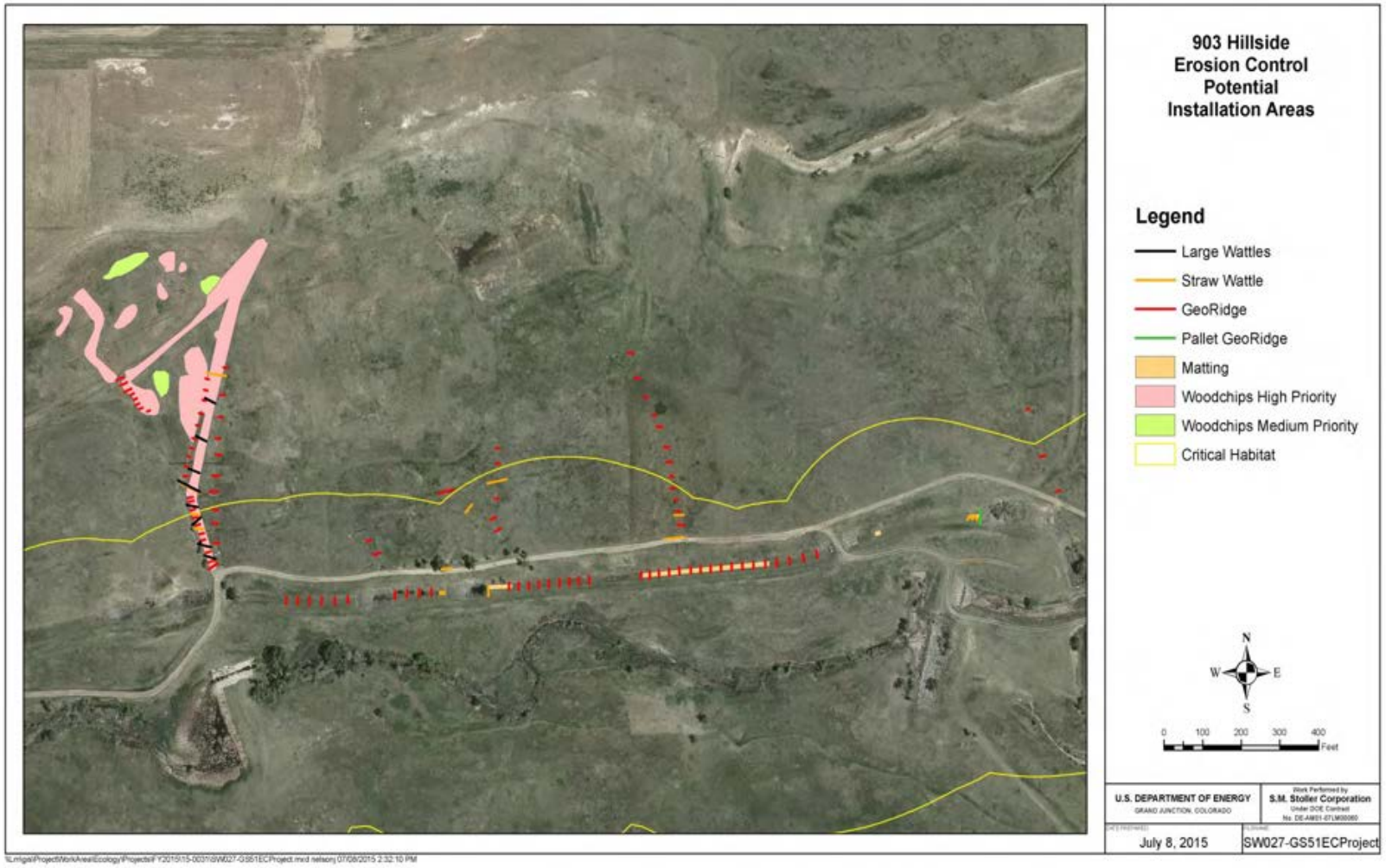

Figure 3. Planned Action Locations

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-06

Purpose: Original Landfill (OLF) Implementation of Interim Action to Reestablish Surface Water Management on Portions of the OLF, with Soil Disturbance Review Plan

Contact Record Approval Date: July 28, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Kurt Franzen, Linda Kaiser, David Ward, John Boylan, George Squibb, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: July 22, 2015

Consultation Meeting Participants: Carl Spreng, CDHPE; Scott Surovchak, DOE; Vera Moritz, EPA; Linda Kaiser, David Ward, George Squibb, John Boylan, SN3; Jody Nelson, Michelle Hansen, JG Management Systems, Inc.

Introduction: Contact Record (CR) 2015-03 approved immediate action to address areas of subsidence and the resulting standing water on portions of the OLF. This subsidence was caused by several weeks of precipitation in the spring of 2015. (May 2015 has been noted as the wettest May in Colorado's recorded history.) The immediate action has been successful in improving drainage of water on the surface of the OLF.

Localized instability of the East Perimeter Channel (EPC) of the OLF first occurred as the result of the rain event from September 9 through September 16, 2013, and was identified as a reportable condition in CR 2013-02, dated September 18, 2013. The efforts to repair, reconfigure, and stabilize the EPC that are listed in CR 2013-03 and modified in CR 2014-09 were postponed due to continuing moisture and weather conditions, and were ultimately completed in January 2015. Since that time, the site has received over 20 inches of precipitation. The subsidence has begun to slow in most areas and stopped in some areas.

Discussion: A qualified geotechnical engineer with prior experience at the OLF visited the OLF several times and made several recommendations to address the need to reestablish surface water flow off the OLF cover over the short term. Recommendations included "laying back" the ground at the top of the largest scarp to achieve a more gentle and uniform slope. This will require cutting up to 6 feet off the top of the scarp and placing the cut material at the base of the scarp, which will lessen the potential for excess erosion on the steep face and the resulting potential for deposits of eroded soil that could hamper the flow of water. To achieve this slope, a "field fit" approach will be used rather than detailed engineered designs. Re-grading this area would also reduce safety concerns presented by the steep scarp (see Figure 1).

Re-grading was also recommended to manage run on, requiring 3-foot cuts at the edge of the waste boundary and creating a series of smaller, but steeper than existing, berms as continuations of berms 4 through 7. Piping will also be added to convey water from the west end of the distressed area to the EPC. As part of the initial action (CR 2015-03), each of the berms was dammed and a pipe was installed to drain the water from the pools formed by the areas of subsidence off the landfill surface and down the slope. This existing piping can be repurposed to extend down the invert of the channels created by the new berms. The soil dams should remain to discourage water from bypassing the pipe. A series of rock dams can be placed over the pipe at intervals of 30 to 50 feet to ensure that piping remains in place until a longer-term solution is designed and implemented. The pipe and berms should slope approximately 10 percent or more to rapidly convey water across the distressed area to the EPC. In areas where relatively large flows have been observed following storm events, larger diameter pipe or multiple 4-inch diameter pipes could be used. Although these aboveground pipes will be subject to freezing for a short time during winter months, that risk should be offset by the ability to monitor pipe performance and correct issues over a comparatively long period of time during the remainder of the year. In addition, with the recommended slope there should be little water remaining in the pipes to freeze.

The area near the northeast edge of the OLF cover, where a rock drain was installed as a part of the OLF closure project, is very wet at the ground surface (see Figure 1). Observations by Rocky Flats staff and exploration using an excavator have shown that this drain appears to be at least partially blocked or clogged, hampering its effectiveness. The wet ground suggests the drain may be full of water that feeds permeable, low-strength lenses in the shallow soils. Excavation in the area to try to provide an outlet for water that may be collecting in the buried rock, thus providing a water source to the distressed areas, will be completed and will require an excavation of approximately 25 feet.

Cracks or voids observed at the ground surface will continue to be filled, tamped, or sealed off at the ground surface using heavy equipment or hand methods, as appropriate, to reduce infiltration of precipitation and snow melt. The ground surface will not be covered with an impermeable barrier, which would be subject to damage by high winds. Impermeable sheeting would also trap moisture and reduce evapotranspiration, potentially causing an increase in water content in the shallow subsurface.

Although distress has been less extensive on the western side of the OLF, local instabilities and distress have been noted (see Figure 1). These areas will be mitigated in a similar manner for the short term (but will not require intrusive work focusing on a subsurface drain, as planned on the eastern side). Scarps, hummocky surfaces, and other slope irregularities can be smoothed and drain pipes installed to more rapidly convey water across the distressed areas until the subsoils have dried and a longer-term solution has been designed.

Disturbed areas, both east and west, will be revegetated using a seed mixture that has proven successful in the area.

The important concept here is to not add any more weight to the OLF cover or water-management structures during this interim action. Therefore, the designed berm heights and cover thickness will not be maintained in these areas during this action. This is consistent with CR 2015-03, Original Landfill Immediate Response to Recent Precipitation, dated May 26, 2015.

DOE plans to start the work in August 2015 and complete it in September 2015. The longer-term approach to the stabilization of the OLF cover by a qualified geotechnical engineer is continuing.

Sampling of the Resource Conservation and Recovery Act wells that monitor the OLF is performed quarterly, and was most recently completed in May 2015. A composite sample at the surface water monitoring location downstream of the OLF in Woman Creek (GS59) was collected on May 18, 2015. This composite sample covers the period from May 9 to May 18. Results of the analysis of this sample will be available on GEMS (Geospatial Environmental Mapping System) after they are validated and will be reported in the corresponding quarterly report.

The soil disturbance, filling, and grading on the OLF cover are subject to the requirements of Rocky Flats Legacy Management Agreement (RFLMA) institutional controls (ICs) as discussed below. An approved Soil Disturbance Review Plan (SDRP) is required, and the RFLMA parties agree that the geotechnical engineer's recommendation provides sufficient information for the SDRP for the proposed work.

IC Evaluation: The soil disturbance work is subject to ICs 2, 3 and 6. Table 1 recaps these ICs.

Table 1. Institutional Controls

IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination. **Rationale:** Contaminated structures, such as building basements, exist in certain areas of the Central Operating Unit, and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be performed without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent migration of residual surface soil contamination to surface water. **Rationale:** Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the Remedial Investigation as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.
IC 6	Digging, drilling, tilling, grading, excavation, construction of any sort (including construction of any structures, paths, trails, or roads), and vehicular traffic are prohibited on the covers of the Present Landfill and the Original Landfill, except for authorized response actions.
	Objective: Ensure the continued proper functioning of the landfill covers. **Rationale:** This restriction helps ensure the integrity of the landfill covers.

The required SDRP is in Attachment 1. The *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, which has been approved by CDPHE and EPA, provides erosion control best-management practices that meet the IC 3 requirements.

Resolution: CDPHE, after reviewing information regarding the proposed soil disturbance and excavation and after consultation with EPA, will approve, approve with modification, or disapprove the proposed activity. CDPHE will determine whether the proposed activity: (1) will not compromise or impair the function of the remedy or (2) will result in an unacceptable release or exposure to residual subsurface contamination. CDPHE will also determine whether the proposed project meets the rationale and objectives of IC 2, 3 and 6.

CDPHE approved the proposed activity stated in this CR on July 28, 2015.

The work will be conducted after CDPHE's approval, but DOE will not conduct the approved soil disturbance until 10 calendar days after this Contact Record is posted on the Rocky Flats site's website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

Progress and the completion of the work will be reported by DOE in RFLMA quarterly and annual reports of surveillance and maintenance activities for the period(s) in which these activities occur.

Closeout of Contact Record: This CR will be closed when the work is completed, post-construction reseeding has been performed, and post-construction erosion controls are in place.

Contact Record Prepared by: David Ward, John Boylan, and Kurt Franzen.

Distribution:
Carl Spreng, CDPHE
Vera Moritz, EPA
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Rocky Flats Contact Record File

Attachment 1

Rocky Flats Legacy Management Agreement Soil Disturbance Review Plan

Proposed Project: Soil Disturbance Review Plan (SDRP) for Implementation of Interim Action to Reestablish Surface Water Management on Portions of the Original Landfill (OLF)

This SDRP provides information required by Rocky Flats Legacy Management Agreement (RFLMA) Attachment 2, "Legacy Management Requirements," Section 4.1, "Soil Disturbance Review Plan," regarding the work proposed by DOE.

Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The purpose of the proposed project is to regrade portions of the OLF cover and East Perimeter Channel (EPC) and to reduce the slope grades in this area to improve slope stability and improve or reestablish drainage features to minimize the potential for infiltration of precipitation in the short term.

Contact Record (CR) 2015-06 Figure 1 shows the location and the lateral extent of the planned regrading, excavation, and soil disturbance. Laying back the largest scarp to achieve a shallower and more uniformly sloping configuration will require a cut of approximately 6 feet. Regrading the face of the cover as noted on CR 2015-06 Figure 1 will require a 3-foot cut at the edge of the waste footprint and in the EPC. The pothole indicated on CR 2015-06 Figure 1 will be approximately 25 feet deep.

Information about any remaining subsurface structures in the vicinity of the proposed project (or state that there are none if that is the case).

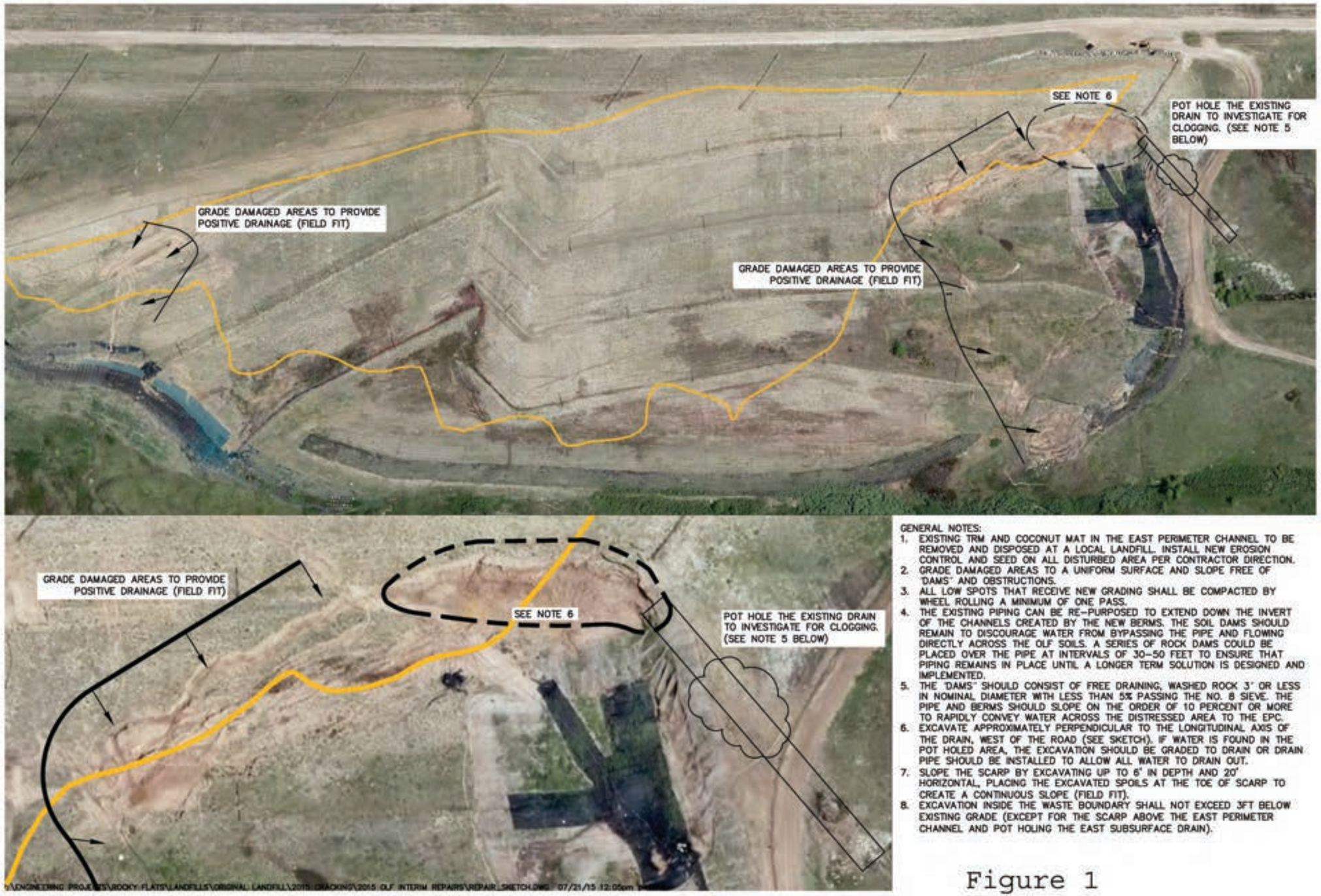
There are no remaining subsurface structures in the vicinity of the proposed project. An abandoned buried natural gas line operated by Xcel Energy is in the utility easement corridor north of the OLF. The location and alignment of this abandoned line is well known and marked with signs. It is well outside of the soil disturbance area.

Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern, or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

The OLF is former IHSS 115. The OLF design had a 2-foot-thick soil cover over the location of the disposed waste materials and clean Rocky Flats Alluvium fill surrounding the waste materials for the placement and configuration of storm water and seep water management features. Limits of the waste area are shown in Contact Record 2015-06 Figure 1.

The project area is in the Upper Woman Drainage Exposure Unit (EU) evaluated in the Comprehensive Risk Assessment, Appendix A, of the Remedial Investigation/Feasibility Study. The only contaminants of concern (COCs) identified for this EU are benzo[*a*]pyrene and dioxins/furans for surface soil/surface sediment.

Dioxin/furan concentrations were converted to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) toxicity equivalents (TEQs) for COC screening and risk characterization. Noncancer risks for benzo[a]pyrene and 2,3,7,8-TCDD TEQ were not evaluated because those COCs do not have noncancer toxicity values. Risks were calculated for benzo[a]pyrene and 2,3,7,8 TCDD TEQ. The estimated Tier 1 total excess lifetime cancer risk to the wildlife refuge worker at the EU is 8E-06, and the Tier 2 risk is 4E-06.



GENERAL NOTES:

1. EXISTING TRM AND COCONUT MAT IN THE EAST PERIMETER CHANNEL TO BE REMOVED AND DISPOSED AT A LOCAL LANDFILL. INSTALL NEW EROSION CONTROL AND SEED ON ALL DISTURBED AREA PER CONTRACTOR DIRECTION.
2. GRADE DAMAGED AREAS TO A UNIFORM SURFACE AND SLOPE FREE OF "DAMS" AND OBSTRUCTIONS.
3. ALL LOW SPOTS THAT RECEIVE NEW GRADING SHALL BE COMPACTED BY WHEEL ROLLING A MINIMUM OF ONE PASS.
4. THE EXISTING PIPING CAN BE RE-PURPOSED TO EXTEND DOWN THE INVERT OF THE CHANNELS CREATED BY THE NEW BERMS. THE SOIL DAMS SHOULD REMAIN TO DISCOURAGE WATER FROM BYPASSING THE PIPE AND FLOWING DIRECTLY ACROSS THE OLF SOILS. A SERIES OF ROCK DAMS COULD BE PLACED OVER THE PIPE AT INTERVALS OF 30-50 FEET TO ENSURE THAT PIPING REMAINS IN PLACE UNTIL A LONGER TERM SOLUTION IS DESIGNED AND IMPLEMENTED.
5. THE "DAMS" SHOULD CONSIST OF FREE DRAINING, WASHED ROCK 3" OR LESS IN NOMINAL DIAMETER WITH LESS THAN 5% PASSING THE NO. 8 SIEVE. THE PIPE AND BERMS SHOULD SLOPE ON THE ORDER OF 10 PERCENT OR MORE TO RAPIDLY CONVEY WATER ACROSS THE DISTRESSED AREA TO THE EPC.
6. EXCAVATE APPROXIMATELY PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE DRAIN, WEST OF THE ROAD (SEE SKETCH). IF WATER IS FOUND IN THE POT HOLED AREA, THE EXCAVATION SHOULD BE GRADED TO DRAIN OR DRAIN PIPE SHOULD BE INSTALLED TO ALLOW ALL WATER TO DRAIN OUT.
7. SLOPE THE SCARP BY EXCAVATING UP TO 6' IN DEPTH AND 20' HORIZONTAL, PLACING THE EXCAVATED SPOILS AT THE TOE OF SCARP TO CREATE A CONTINUOUS SLOPE (FIELD FIT).
8. EXCAVATION INSIDE THE WASTE BOUNDARY SHALL NOT EXCEED 3FT BELOW EXISTING GRADE (EXCEPT FOR THE SCARP ABOVE THE EAST PERIMETER CHANNEL AND POT HOLING THE EAST SUBSURFACE DRAIN).

Figure 1

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-07

Purpose: Vinyl chloride results from the Present Landfill Treatment System (PLFTS) effluent triggered the consultative process.

Contact Record Approval Date: August 31, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); George Squibb, Linda Kaiser, David Ward, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: July 22, 2015

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; Linda Kaiser, SN3, David Ward, SN3

Discussion: As part of the Present Landfill closure, a passive seep interception and treatment system was installed to treat volatile organic compounds (VOCs) in landfill seep water and Groundwater Intercept System (GWIS) water. There are three sources of influent to the treatment system: two GWIS pipes and the Present Landfill seep. Effluent from the treatment system eventually flows to the former Landfill Pond area.

As required by the *Rocky Flats Legacy Management Agreement* (RFLMA) Attachment 2, Table 2, "Water Monitoring Locations and Sampling Criteria," the Present Landfill Treatment System (PLFTS) effluent monitoring requirements consist of routine quarterly sampling for VOCs, semivolatile organic compounds, and metals to evaluate remedy performance. In accordance with RFLMA Attachment 2, Figure 11, "Groundwater Treatment Systems," an exceedance of a surface-water standard at the PLFTS effluent monitoring location (PLFSYSEFF) triggers monthly effluent sampling to provide additional data for evaluation. If exceedances continue for three consecutive samples during the subsequent increased-frequency sampling period, sampling is triggered at location NNG01 (downstream of the former Landfill Pond area) for those constituents in question. Concurrently, consultation between the RFLMA parties takes place to determine whether a change in the remedy is required, if additional parameters need to be analyzed, or if a modification of the monitoring plan is warranted.

The routine quarterly effluent sample collected on 3/11/2015 (Table 1) showed a vinyl chloride concentration exceeding the practical quantitation limit (PQL) of 0.2 microgram per liter (µg/L) standard from the RFLMA Attachment 2, Table 1, "Surface Water Standards." (As a point of reference the 0.2 µg/L is based on the water supply standard and neither Walnut Creek nor Big Dry Creek have drinking water supply intakes.) Subsequent sampling at the increased frequency showed three consecutive vinyl chloride concentrations also exceeding the RFLMA PQL, which

triggered sampling at location NNG01 and consultation. The Site PQL of 0.2 µg/L is well below the drinking water standard (i.e., the maximum contaminant level of 2.0 µg/L).

Location NNG01 was sampled on 7/27/2015 (Table 2), and vinyl chloride was not detected.

Similar situations occurred in 2007 and 2014. The RFLMA parties took no additional actions, and the sampling protocol returned to the routine quarterly sampling at PLFSYSEFF for those occurrences.

The RFLMA parties have consulted regarding the results summarized in Tables 1 and 2 and have agreed to continue the RFLMA sampling protocol with no changes or additional actions.

Table 1. Present Landfill Treatment System Effluent (PLFSYSEFF): Summary of Analytical Results

Analyte	Sample Date	Result[a]	Units	RFLMA Attachment 2, PQL
Vinyl Chloride	***3/11/2015***	***0.23***	***µg/L***	***0.20***
	4/28/2015	0.24	µg/L	0.20
	5/28/2015	*0.26*	*µg/L*	*0.20*
	6/29/2015	0.25	µg/L	0.20

Notes: The initial result triggering monthly sampling is shown in **bold**. The routine quarterly samples are shown in italics.

[a] All results are J qualified. "J qualified" means the analyte was positively identified. The associated numerical value is an estimated quantity.

Table 2. Former Landfill Pond Area Outflow (NNG01): Summary of Analytical Results

Analyte	Sample Date	Result[a]	Units	RFLMA PQL
Vinyl Chloride	7/27/2015	<0.10	µg/L	0.20

Notes: The 6/29/2015 PLFSYSEFF result (Table 1) was received on 7/21/2015, triggering sampling at NNG01.

[a] The result is U qualified. "U qualified" means the analyte was not detected at a concentration greater than the method detection limit.

Resolution: Carl Spreng, CDPHE, approved this contact record.

Closeout of Contact Record: This contact record will be closed when it is posted on the Rocky Flats Site website.

Contact Record Prepared by: David Ward and George Squibb

Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Vera Moritz, EPA
Linda Kaiser, SN3
Rocky Flats Contact Record File

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-08

Purpose: Solar Ponds Plume Treatment System Interim Design and Implementation

Contact Record Approval Date: September 8, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, Linda Kaiser, David Ward, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: July 13, 2015

Consultation Meeting Participants: Carl Spreng, CDHPE; Scott Surovchak, DOE; John Boylan, Kurt Franzen, Linda Kaiser, George Squibb, David Ward, SN3; Michelle Hanson, Jody Nelson, JG Management Systems, Inc.

Introduction: The Solar Ponds Plume Treatment System (SPPTS) at the Rocky Flats, Colorado, Site collects and treats water contaminated with nitrate and uranium. As described in several annual reports (especially the annual reports for 2006, 2007, 2008, and 2009) and documented in Contact Records 2007-02, 2008-03, 2008-06, 2008-08, 2009-01, and 2014-08, the SPPTS has been the focus of extensive study and modification over the past several years, particularly since the site closed. The primary objective has been to improve collection and treatment of contaminated groundwater, and has included repairs, subsurface exploration, treatability studies (laboratory, bench-scale, and pilot-scale), and the design and construction of system upgrades. Several factors drove these efforts, including the following:

1. Historically, concentrations of nitrate and uranium measured at the sampling location associated with the subsurface effluent discharge gallery (formally referred to as SPPDISCHARGEGALLERY, but often shortened to Discharge Gallery or DG) usually exceeded those in untreated influent to the system, even though this is where effluent confirmed to be adequately treated contributes to a pool of water on the ground surface.
2. Accessing and maintaining the treatment media and plumbing within the original structure is costly and difficult.
3. The original treatment media is not optimal over the long term. All of the currently viable alternatives for future system configurations eliminate use of the treatment media as configured in the original system.

The first factor listed above was addressed in 2008 with the installation of components that capture more of the contaminated groundwater. Recent annual reports (i.e., 2010, 2011, 2012, 2013, and 2014) have presented and discussed further efforts to optimize the effectiveness of the

SPPTS and to test alternatives for system reconfiguration, focusing on the performance of bench-scale and pilot-scale treatability studies.

The current focus has shifted to a more extensive reconfiguration of the system. Design of this reconfiguration was scheduled to begin in 2016. However, due to the condition of the media and the overburden within the large original treatment cell structure (the "Big Box") and the fact that the Big Box has become clogged, this component needs to be emptied sooner. The heavy precipitation in the first 6 months of 2015 (greater than a typical year) has increased the need to empty the system and improve treatment of influent water. Evaluation of the best long-term configuration of the system is in progress, requiring further testing and alternatives analysis. Simply replacing the treatment media in the Big Box would not be appropriate or adequate due to the flow rates, the treatment targets, and the substantial waste that would result for such a short-term operation. Therefore, a different configuration is necessary in the interim period.

Discussion: During the July 13, 2015, Rocky Flats Legacy Management Agreement (RFLMA) parties' consultation, the following SPPTS interim configuration was proposed and discussed:

1. Empty the Big Box material (overburden and treatment media) and dispose of the material as discussed below.
2. Take the Phase II uranium treatment cell out of service and remove and dispose of its contents as discussed below.
3. Create a lagoon in Cell 1 and a settling tank in Cell 2 of the Big Box. Cell 1 is the larger of the two cells and can provide a residence time for the entire SPPTS groundwater flow similar to the residence time that currently is used in the pilot-scale lagoons. The pilot-scale lagoons have been successful in removing nitrate (see the 2014 Annual Report). The pilot-scale lagoons also remove substantial uranium from the influent (generally 30 to 50 percent, sometimes more). No additional full-scale uranium treatment component will be installed in the interim system.
4. Install an insulated roof over the Big Box to reduce temperature fluctuations in the lagoon, which will help to maintain a healthy population of denitrifying bacteria.
5. Continue to test approaches for treating uranium, focusing primarily on the lagoon effluent. These tests will be performed on only a small portion of the effluent volume.

The proposal was based on the following considerations:

- The contents of the Big Box need to be removed very soon to resolve the clogged media problem.
- The pilot-scale lagoons have been successful in treating nitrate as well as in removing a substantial portion of the uranium.
- The recently tested microcell approach would be labor-intensive if it was operated at full scale. Based on current flows, approximately 10 microcells at a time would be needed to achieve a uranium concentration similar to what is seen from the pilot-scale lagoons, and each microcell would operate for only 1 to 2 weeks before needing replacement. This approach also would generate significant waste.
- A recently issued geochemical report shows that the SPPTS influent represents only a small portion of the uranium load in North Walnut Creek (i.e., less than 10 percent).

- Because nitrate can mobilize uranium through the chemical oxidation process, decreasing the nitrate in North Walnut Creek might also decrease uranium concentrations.

Therefore, the emphasis during the SPPTS interim configuration will be on treating nitrate in a full-scale lagoon.

This SPPTS interim configuration will be implemented starting in October 2015 when the Big Box will be emptied.

Water Management: While the Big Box is offline, untreated SPPTS influent will be pumped upgradient of the collection trench as previously approved in Contact Record 2008-06. (A small portion of the water will be directed to the pilot-scale lagoons periodically to maintain the treatment effectiveness of these components, as they will be the source of the denitrifying bacteria for the lagoon that will be installed in the Big Box.) Water that has passed through media in the Big Box is considered treated and the clear water (i.e., containing minimal particulates) generated during the process of removing and dewatering the media will be placed in the effluent manhole. If turbid water is generated during the process of dewatering the media, it will be placed upgradient of the SPPTS collection trench.

Media Management: The material in the Big Box consists of the following:

- Overburden (approximately 260 cubic yards of 90 percent wood chips and 10 percent dirt)
- Cell 1 nitrate treatment media (approximately 218 cubic yards of 90 percent sawdust and 10 percent zero-valent iron [ZVI]), plus 1 foot of gravel (20 cubic yards)
- Cell 2 uranium treatment media (approximately 72 cubic yards of 85 percent pea gravel and 15 percent ZVI), plus 1 foot of gravel (7 cubic yards),

The materials in the Big Box have been determined to be a solid waste. As such, the contents will be disposed of as a single waste stream at a local landfill**.** The solid waste characterization is based on process knowledge, the analytical data from the 2011 sampling event, and an evaluation by a certified health physicist.

The Phase II treatment cell contains media consisting of a varying mixture of pea gravel and ZVI installed as layers (from approximately 15 percent ZVI in the bottom layer to 45 percent ZVI in the upper layer). This treatment media was installed in 2010 and has a slightly higher content of ZVI and a different type of pea gravel than the original Phase II media. The media removed in 2010 was analyzed and shipped to the Energy Solutions disposal facility in Utah as low-level waste. Based on the 2010 data and the fact that the current treatment media is treating the same groundwater plume, the media removed during fall 2015 will also be disposed of at the low-level waste disposal facility in Utah.

Operations: Going forward, the Big Box lagoon will be operated and monitored for a minimum of four full seasons to evaluate nitrate and uranium removal efficiency, sludge buildup, factors that affect removal efficiency, optimization needs, and operation and maintenance requirements and costs. Results will inform the consideration and design of a longer-term SPPTS configuration.

The RFLMA parties agreed with implementing the above proposed SPPTS interim configuration.

Resolution: CDPHE, after consultation with EPA, will approve, approve with modification, or disapprove this contact record.

After completion of the approval process and incorporation of any required changes CDHPE approved this contact record.

Closeout of Contact Record: Progress and the completion of the work will be reported by DOE in RFLMA quarterly and annual reports of surveillance and maintenance activities for the period(s) in which these activities occur. The contact record will be closed when the media is removed, the required infrastructures are installed and any required revegetation and erosion controls are in place.

Contact Record Prepared by: David Ward and John Boylan

Distribution:
Carl Spreng, CDPHE
Vera Moritz, EPA
Scott Surovchak, DOE
Linda Kaiser, SN3
Rocky Flats Contact Record File

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-09

Purpose: Soil Disturbance Review Plan for Solar Ponds Plume Treatment System Interim Configuration

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Contact Record Approval Date: December 7, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Kurt Franzen, Linda Kaiser, David Ward, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: October 28, 2015

Consultation Meeting Participants: Carl Spreng, CDPHE; Vera Moritz, EPA; Scott Surovchak, DOE; Linda Kaiser, John Boylan, George Squibb, Kurt Franzen, Michelle Hanson, David Ward, Navarro.

Introduction: Contact Record 2015-08, "Solar Ponds Plume Treatment System Interim Design and Implementation," summarizes the Rocky Flats Legacy Management Agreement (RFLMA) parties' consultation and decision to convert the current Solar Ponds Plume Treatment System (SPPTS) Cell 1 and Cell 2 structure (the "Big Box"), which is currently filled with wood chips, mulch, and soil over treatment media consisting of sawdust mixed with zero-valent iron (ZVI) in Cell 1 and pea gravel mixed with ZVI in Cell 2, into a lagoon for the removal of nitrate. Testing for uranium removal approaches will be conducted on a portion of the lagoon effluent. The use of a lagoon to reduce nitrate has been demonstrated in the Phase III pilot-scale lagoon studies. Information on the status of operation and performance of the SPPTS is provided in RFLMA quarterly and annual site surveillance and maintenance reports. RFLMA contact records and site surveillance and maintenance reports are available on the Rocky Flats public website at http://www.lm.doe.gov/rocky_flats/Sites.aspx.

Discussion: The following was discussed during the October 28, 2015 consultation: The design of the infrastructure required to support the operation of the Big Box as a lagoon and to continue testing for uranium removal is basically complete. Approval of the Soil Disturbance Review Plan (attached) is required. To accommodate continued uranium treatment testing, a concrete vault will be installed outside the east edge of the Big Box. This vault will provide space for study of uranium removal from lagoon effluent (for example, using microcells), and is designed to support a shed if more space is needed in the future.

Construction of the vault will require the excavation of approximately a 35 feet (ft) × 25 ft × 8 ft deep hole (see Attachment 2 for location). This "sidecar vault", an 8 ft × 8 ft × 5 ft deep structure, will be attached to the outside of the eastern wall of the Big Box. The larger excavation is a safety requirement for access during construction.

Construction: As discussed in Contact Record 2015-08, the Big Box will be taken offline for approximately 8 to 10 weeks to allow for media removal, construction of a roof over the Big Box, installation of the sidecar vault, and installation of plumbing and pumps and associated electrical infrastructure. If more electrical power is required than is currently available, additional photovoltaic (PV) solar panels and batteries will be installed. PV solar panels and supports may be added near the existing solar array if additional power is required. A large, inner plastic tank may be inserted in the existing carbon (MCG) vault to contain the larger volumes of MCG that will be used.

The media and overburden from the Big Box, the prior Phase III Cell A and B media, the Phase II media, and spent microcell media will be removed and dispositioned as discussed in Contact Record 2015-08. The Phase II tank will remain empty, but during construction of the full-scale interim lagoon, it may be used to store water (including effluent from the pilot-scale Phase III lagoons).

A construction staging area will be located on the pediment south of the SPPTS. It will be used to support both waste removal and construction activities, since the SPPTS area has a minimal working area. The staging area is less than 1 acre in size and will be revegetated after use.
A construction trailer will be located in the SPPTS area (see Attachment 2 for location). The construction trailer will be anchored to withstand 100-mile-per-hour winds.

Institutional Controls (IC) Evaluation: The soil disturbance work is subject to IC 2 and IC 3. Table 1 recaps these ICs.

Table 1. Institutional Controls

Controls	Use Restrictions
IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination. **Rationale:** Contaminated structures, such as building basements, exist in certain areas of the Central Operating Unit, and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be performed without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent migration of residual surface soil contamination to surface water. **Rationale:** Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the Remedial Investigation as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.

The required Soil Disturbance Review Plan is in Attachment 1.

Resolution: CDPHE has reviewed information regarding the proposed soil disturbance and excavation and, after consulting with EPA, has approved the proposed activity and the proposed grading plan. CDPHE has determined that the proposed activity will not compromise or impair the function of the remedy or result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined that the proposed project meets the rationale and objectives of IC 2 and IC3.

The work will be conducted after CDPHE's approval, but DOE will not conduct the approved soil disturbance until 10 calendar days after this Contact Record is posted on the Rocky Flats site's website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan. The work is planned to be conducted and completed in the spring of 2015.

Closeout of Contact Record: Progress and the completion of the interim configuration construction work will be reported by DOE in RFLMA quarterly and annual reports of surveillance and maintenance activities for the period(s) in which these activities occur. The contact record will be closed when the Big Box and Phase II cell have been emptied, the infrastructure (roof, plumbing, and vault) has been installed, and any required revegetation and erosion controls are in place.

Contact Record Prepared by: David Ward and John Boylan

Distribution:

Carl Spreng, CDPHE
Scott Surovchak, DOE
Vera Moritz, EPA
Linda Kaiser, Navarro
Rocky Flats Contact Record File

Attachment 1

Rocky Flats Legacy Management Agreement (RFLMA)
Soil Disturbance Review Plan (SDRP)

Proposed Project: SDRP for Solar Ponds Plume Treatment System (SPPTS) Interim Configuration

This SDRP provides information required by RFLMA Attachment 2, "Legacy Management Requirements," Section 4.1, "Soil Disturbance Review Plan," regarding the work proposed by DOE.

(1) Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The purpose of the project is to convert the existing SPPTS "Big Box" (the concrete structure containing the two original treatment cells) from a reactive media–based treatment system (sawdust plus zero-valent iron [ZVI] in Cell 1 and pea gravel plus ZVI in Cell 2, all beneath an overburden of wood chips, mulch, and soil) to a lagoon, plus provide the necessary infrastructure to support the operations and additional uranium treatment testing. All of the planned construction is within the existing SPPTS disturbed area. A hole approximately 35 feet (ft) × 25 ft × 8 ft deep will be excavated to install the sidecar vault on the east end of the Big Box (see Attachment 2 to Contact Record 2015-09 for location). This vault will provide plumbing and space for testing uranium treatment components. After the vault is installed, the surrounding area will be graded to near the top of the vault. Photovoltaic (PV) solar panels and supports may be added near the existing solar array if additional power is required. The area around the Big Box will be graded with offsite material to bring the ground surface up to the level of the top of the concrete around the Big Box. The final grade will be higher than the existing grade. During construction, a temporary construction trailer will be located inside the SPPTS disturbed area as shown in Attachment 2 and will be anchored to withstand a minimum of 100-mile-per-hour winds. This trailer will be removed at the end of construction.

Another area of disturbance is the construction laydown area, less than an acre, located on the pediment upgradient of the SPPTS (see Attachment 2 to the Contact Record for location). The area will have 2-inch or 3-inch minus rock placed to support the construction activities. After this work has been completed, the rock will be removed and stockpiled onsite for reuse, and the area revegetated. Since the disturbance in this area will be returned to the existing grade or higher it is compliant with IC 3 and requires no approval.

All incoming borrow material will come from a local commercial aggregate facility.

(2) Information about any remaining subsurface structures in the vicinity of the proposed project.

Other than components of the SPPTS itself, there are no remaining subsurface structures in the vicinity, so cover assumptions will not be violated.

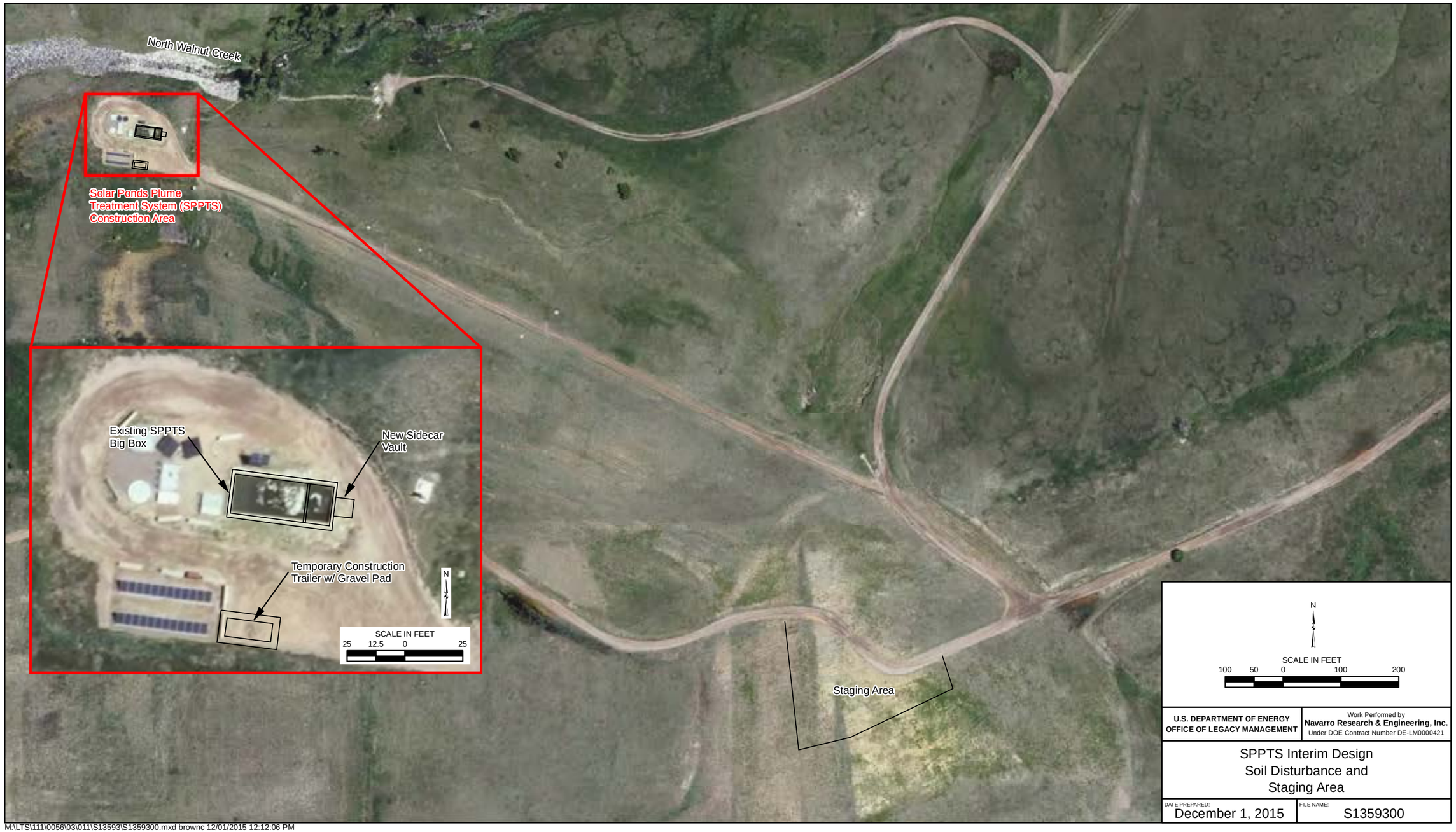
(3) Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

This construction area was not an IHSS. The *Facility Investigation - Remedial Investigation/Corrective Measures Study - Feasibility Study Report for the Rocky Flats Environmental Technology Site Nature and Extent of Soil Contamination* figures do not indicate soil contamination in this area. Groundwater in the vicinity is impacted by the Solar Ponds Plume. Any groundwater that is encountered in an excavation will be collected from the excavation, if necessary to conduct the construction work, and will either be pumped from the excavation to the surface generally southwest (upgradient) of the SPPTS to allow this water to seep back into the ground, as approved in Contact Record 2008-06, or will be containerized and held for treatment at the SPPTS for treatment when construction is completed, at the discretion of the field crew.

(4) Resurvey any new surface established in subsurface soil, unless sufficient existing data is available to characterize the surface (or state that the excavated soil will be replaced and the original contours restored).

The sidecar vault will be installed in the approximately 35 ft × 25 ft × 8 ft deep excavation and the surrounding area will be graded to the top of the vault wall (which will be raised slightly above the existing grade). Any excavations for PV solar supporting structure(s) will be filled with concrete and the surrounding surface will be returned to the existing grade or higher.

The rock placed to reduce disturbance of the staging area will be removed from that area after construction is completed to help establish vegetation. The existing grade will be maintained. There are no other underground structures or infrastructure in the area.



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ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2015-10

Purpose: Area of Concern Well 10304 Reportable Condition

Contact Record Approval Date: December 16, 2015

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); John Boylan, Linda Kaiser, David Ward, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: December 1, 2015

Consultation Meeting Participants: Carl Spreng, CDPHE; Scott Surovchak, DOE

Background: The *Rocky Flats Legacy Management Agreement* (RFLMA) defines several categories of groundwater monitoring wells at the Rocky Flats Site. Of these, Area of Concern (AOC) wells have reportable conditions defined. AOC wells are located within a drainage and downgradient of one or more contaminant plumes and are monitored semiannually to determine whether the plume(s) may be impacting surface water quality. The primary objective of AOC well 10304 is to evaluate groundwater quality adjacent to Woman Creek, downgradient of the 903 Pad/Ryan's Pit Plume.

As discussed in the *Quarterly Report of Site Surveillance and Maintenance Activities, Second Quarter Calendar Year 2015* (DOE 2015), a groundwater sample collected on May 7, 2015, from well 10304 contained an elevated concentration of trichloroethene (TCE). The RFLMA water-quality standard, set forth in Attachment 2, Table 1 to the RFLMA, is 2.5 micrograms per liter (µg/L); the concentration in this sample was 15 µg/L. While TCE (and other volatile organic compounds [VOCs]) has been detected previously in samples from well 10304, it has not been reported in samples from this well at concentrations exceeding the RFLMA standard. A non-RFLMA confirmatory sample was collected on June 17 to assess whether this result might be erroneous; the TCE result in that second sample was 5.4 µg/L.

As outlined in RFLMA Attachment 2, Figure 7, a reportable condition for an AOC well exists when two consecutive, routine, semiannual samples contain the same analyte at concentrations exceeding the corresponding RFLMA standard. The fourth-quarter sample collected from well 10304 on October 29, 2015, contained a TCE concentration of 72 µg/L. This represents the second consecutive semiannual result above the RFLMA standard, and therefore, a reportable condition exists for AOC well 10304.

Per RFLMA, within 15 days of receiving validated data defining a reportable condition, DOE must notify the agencies. Within 30 days of that date, DOE will provide a plan and schedule to

the regulators for an evaluation to address the occurrence. A consultation will follow and mitigating actions, if any, implemented thereafter.

Discussion: The potential for a reportable condition was noted in the above-referenced quarterly report for the second quarter of 2015. In fact, such a condition is anticipated during wet years, as described in the *Final Interim Measure/Interim Remedial Action for Groundwater at the Rocky Flats Environmental Technology Site* (Groundwater IM/IRA) (Kaiser-Hill 2005) and in the report on fate and transport modeling for VOCs (see *Fate and Transport Modeling of VOCs at the Rocky Flats Environmental Technology Site* [Kaiser-Hill 2004]). The Groundwater IM/IRA notes that "the downgradient portion of this plume only has the ability to impact surface water in wet years" (p. 6-31). The referenced modeling report concludes that groundwater from this plume may discharge to Woman Creek under conditions of higher-than-normal precipitation and notes that concentrations of TCE, in particular, in groundwater reaching Woman Creek may exceed standards. Therefore, given that 2015 has been an exceptionally wet year, the TCE results reported for AOC well 10304 are not unexpected. Installation of a groundwater treatment system downgradient of the 903 Pad/Ryan's Pit Plume was considered as part of site closure; however, due to the infrequency with which it would be needed (in the 10 years since site closure, this is the first year treatment might have been considered) and the costs and effort required to operate and maintain such a system, it was not required as part of the selected remedy/correction action to ensure that the site remain protective of human health and welfare and the environment.

DOE verbally informed CDPHE of the results from the fourth-quarter sample the same day validation was completed, on December 1, 2015. The plan for evaluating this occurrence was discussed at the same time. An email notification to EPA and CDPHE followed on December 3, 2015.

This Contact Record describes the plan and schedule to address the reportable condition.

- A grab sample will be collected from Woman Creek downgradient/downstream and in the vicinity of well 10304 to evaluate the potential for VOC-contaminated groundwater to adversely affect surface water quality in this reach of Woman Creek. The location of the sample will be determined based on a field walkdown and will be suitable and convenient for sample collection while still being downgradient of the plume and in the immediate vicinity of the well.
- When the results of the surface water sample are available, there will be further consultation.
- Grab samples will be collected from this Woman Creek surface water location each time AOC well 10304 is sampled, until water quality at the well is no longer reportable.

Analytical results from these samples will be included in the corresponding quarterly and annual reports.

Resolution: CDPHE, after consultation with EPA, will approve, approve with modification, or disapprove this contact record.

After completion of the approval process and incorporation of any required changes CDHPE approved this contact record.

Closeout of Contact Record: This contact record will be closed when the water quality at well 10304 is no longer reportable.

Contact Record Prepared by: John Boylan, David Ward, Navarro

Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Vera Moritz, EPA
Linda Kaiser, Navarro
Rocky Flats Contact Record File

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2016-01

Purpose: Reportable condition for evaluation purposes for uranium at Walnut Creek Point of Compliance (WALPOC).

Contact Record Approval Date: March 25, 2016

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); George Squibb, Linda Kaiser, David Ward, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: March 1, 2016

Consultation Meeting Participants: Carl Spreng, CDPHE; Scott Surovchak, DOE

Discussion: A reportable condition occurred at surface water Point of Compliance (POC) WALPOC (sampling location identification) at the Rocky Flats Site based on an evaluation of validated analytical results for uranium from the composite sample collected during the period of 12:08 p.m. on January 4, 2016, to 1:30 p.m. on January 28, 2016.

The evaluation was performed in accordance with *Rocky Flats Legacy Management Agreement* (RFLMA) Attachment 2, Figure 5, "Points of Compliance," and resulted in a calculated 30-day average concentration for uranium of 16.9 micrograms per liter (µg/L) on January 27, 2016. This concentration exceeds the RFLMA-applicable Table 1 standard of 16.8 µg/L. Validated results were received on February 24, 2016, and notification to the regulatory agencies and the public—in accordance with RFLMA Attachment 2, Figure 5—was made by email on March 2, 2016. A representative of CDPHE and DOE discussed this result on March 1, 2016, and developed a path forward.

Pursuant to RFLMA Attachment 2, Section 6.0, "Action Determinations," a reportable condition necessitates the following actions:

- DOE must submit a plan and schedule for an evaluation to address the condition within 30 days of receiving the validated data for the reportable condition.
- DOE will consult with CDPHE and EPA to determine if mitigating actions are necessary.
- The objective of the consultation will be to determine a course of action (if necessary) to address the reportable condition and to ensure that the remedy remains protective.
- The results of the consultation will be documented in contact records, written correspondence, or both.

This contact record documents DOE's consultation with CDPHE on March 1, 2016.

The RFLMA Parties agreed on the evaluation steps described below and that no mitigating actions are necessary at this time, for the following reasons:

- The remedy remains protective. The remedy standard for total uranium at the WALPOC sampling location is the calculated 12-month rolling average. Using the most recent validated data, the calculated 12-month rolling average at WALPOC for total uranium on January 31, 2016, is 8.0 µg/L and remains well below the 16.8 µg/L remedy performance standard.
- WALPOC has been a RFLMA monitoring location for roughly 4.5 years. During that period, the Site experienced one of its driest years (2012), its wettest month (September 2013), and one of its wettest springs (2015), according to precipitation data collected since 1990. Because uranium concentrations are influenced by changing environmental conditions, varying uranium concentrations at WALPOC are anticipated. While significant uranium concentration variability can be seen in both individual sample results and in the 30-day averages, the observed variability is not outside of anticipated ranges and remains well below 30 µg/L drinking water standard (i.e., the maximum contaminant level [MCL]).
- Measured concentrations of total uranium at WALPOC include both naturally occurring and anthropogenic uranium. Previous high-resolution isotopic uranium analyses for WALPOC show signatures that are between 68−82 percent naturally occurring uranium. The variable concentrations discussed above and these signatures do not suggest the existence of a new source.
- The variability of the uranium concentration influenced by environmental conditions was detailed in a study conducted by a qualified geochemistry subcontractor, the results of which were published in the *Evaluation of Water Quality Variability for Uranium and Other Selected Parameters in Walnut Creek at the Rocky Flats Site* (September 2015) report that can be found at http://www.lm.doe.gov/Rocky_Flats/Documents.aspx.
- Although the recent result was above the 16.8 µg/L Site standard, it remains well below the 30 µg/L drinking water standard. While the MCL is not applied at the Site, the fact that the uranium concentration triggering this reportable condition was well below that level indicates that the remedy remains protective of human health and the environment.

Plan and Schedule to Address the Reportable Condition: The RFLMA Parties agreed that steps described in this Contact Record shall serve as the plan and schedule for the evaluation.

The following steps have been or are being taken and will be utilized during the evaluation.

- Flow-paced composite samples routinely being collected at WALPOC will continue to be analyzed on a 2-week turnaround.
- On March 7, 2016, DOE provided CDPHE with a split sample from the WALPOC composite sample collected during the period of February 16, 2016, to March 3, 2016, which was the first sample collected after the March 1, 2016, consultation. This split sample will be analyzed for uranium at the State's Radiochemistry Laboratory.

DOE will report the results of this monitoring and of the subsequent evaluation in RFLMA quarterly and annual reports of surveillance and monitoring activities. This plan and schedule may be modified based on the outcome of RFLMA Party consultation related to the evaluation.

To keep the public informed, the outcome of continuing RFLMA Party consultation regarding the evaluation will be reported in RFLMA quarterly and annual reports of surveillance and monitoring activities or in subsequent contact records.

Resolution: CDPHE, after consultation with EPA, will approve, approve with modification, or disapprove this contact record.

Closeout of Contact Record: This contact record will be closed when the results from the evaluation have been transmitted to CDPHE or as the RFLMA Party consultation related to this evaluation directs.

Contact Record Prepared by: George Squibb and David Ward, Navarro

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Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Vera Mortiz, EPA
Linda Kaiser, Navarro
Rocky Flats Contact Record File

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2016-02

Purpose: Mound Site Plume Treatment System reconfiguration project Soil Disturbance Review Report and Explanation of Significant Differences

Contact Record Approval Date: June 15, 2016

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Kurt Franzen, Linda Kaiser, and David Ward, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: January 14, January 20, and February 18, 2016

Consultation Meeting Participants: Scott Surovchak, DOE; Carl Spreng, CDPHE; Vera Moritz, EPA; Linda Kaiser, John Boylan, George Squibb, Jody Nelson, Michelle Hanson, David Ward, Navarro

Introduction:
During the Rocky Flats Legacy Management Agreement (RFLMA) consultation on February 18, 2016, the Colorado Department of Public Health and Environment (CDPHE), the U.S. Environmental Protection Agency (EPA), and the U.S. Department of Energy (DOE) (jointly referred to as the RFLMA Parties) agreed the Mound Site Plume Treatment System reconfiguration project represents a significant change to the *Corrective Action Decision/Record of Decision for the Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit, Jefferson and Boulder Counties, Colorado* (CAD/ROD) signed September 29, 2006 (available at http://www.lm.doe.gov/Rocky_Flats/Regulations.aspx). It was also determined that the RFLMA process of documenting the RFLMA Parties' decisions as contact records in the Administrative Record, posting those contact records on the Rocky Flats public website, and notifying area stakeholders by email of the posting fulfills the process outlined in Title 40 *Code of Federal Regulations* Section (40 CFR) 300.435(c)(2)(i) for announcing an Explanation of Significant Differences (ESD) except for providing a notice of availability of the ESD in a local newspaper. Therefore, a notice of this contact record and ESD will be posted in the *Denver Post* to fulfill this ESD requirement.

Lead and Support Agencies: As outlined in the RFLMA the Parties follow a consultative process for implementing the agreement. As stated in the agreement:

> "Consultation" and "the consultative process" mean the responsibility of one Party to meet and confer with another Party and any appropriate contractors in order to reach agreement, to the extent possible, regarding a proposed course of action.

This contact record/ESD addresses the components of CAD/ROD as it concerns the contaminated groundwater collected and treated by the Mound Site Plume Treatment System (MSPTS). As agreed in the RFLMA and a Memorandum of Understanding between CDPHE and EPA, CDPHE is the lead agency with EPA as the support agency for this course of action.

This contact record/ESD documents a significant difference to the selected remedy in the CAD/ROD for the MSPTS and was prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and with 40 CFR 300.435(c)(2)(i). The EPA Superfund Identification Number for Rocky Flats is CO7890010526.

This contact record/ESD will be available on the Rocky Flats public website at http://www.lm.doe.gov/Rocky_Flats/Sites.aspx. This contact record/ESD also will become part of the Rocky Flats site Administrative Record, which is available on the CERCLA Administrative Records search webpage at http://www.lm.doe.gov/CERCLA/SiteSelector.aspx 24 hours a day, 7 days a week. (On that webpage, select **Rocky Flats Site** from the drop-down list and then click the **Search the Administrative Record** button.) Also available on the Rocky Flats public website is a Rocky Flats Site Fact Sheet that provides a brief summary of contamination and site history.

Basis for the Document:
As discussed in RFLMA Contact Record (CR) 2015-04 dated July 8, 2015, the MSPTS described in the CAD/ROD includes a groundwater intercept trench, treatment components, and a subsurface discharge gallery. Groundwater collected in the trench flows by gravity through two plastic treatment cells (approximately 10 feet in diameter and 11.5 feet tall) filled with zero-valent iron (ZVI) treatment media. The ZVI is obtained from a source in Detroit, Michigan, and is trucked to the site for installation. Periodically, exhausted ZVI media must be removed and replaced, which is costly and labor intensive and requires the use of heavy construction equipment. The initial estimate of the frequency of media replacement was every 5–10 years. The most recent MSPTS media replacement was performed in 2010–2011. Based on historical operations of the MSPTS and analytical data from the water being treated, it may be more appropriate to perform routine media replacement every 4–5 years.

As stated in the CAD/ROD and the Final Mound Site Plume Decision Document (March 1994) the MSPTS was initially designed to simply reduce contaminant load to surface water. However, with the subsequent implementation of the RFLMA, effluent from the MSPTS was evaluated against the surface water quality standards listed in RFLMA Attachment 2, Table 1. Because the MSPTS system effluent typically contains one or more volatile organic compound (VOC) constituents at levels above RFLMA standards, the RFLMA Parties have consulted on ways to optimize treatment to further reduce the potential VOC contaminant load to surface water (RFLMA CR 2010-07 dated November 2, 2010). In 2011, a solar-powered pump was installed in

the existing MSPTS effluent manhole to circulate water from the bottom of the manhole through a spray nozzle (also situated within the effluent manhole) to further treat the effluent using the air-stripping process (RFLMA CR 2011-01 dated January 14, 2011). This has been extremely effective, but significant maintenance is required to maintain high treatment effectiveness, and even then at least one VOC typically exceeds the corresponding RFLMA Table 1 standard. In addition, the presence of this air stripper does not substantially affect the requirement to replace the ZVI media periodically, since the upstream media removes most of the VOCs treated at the MSPTS.

The positive results of the MSPTS effluent manhole air stripper, together with additional testing at the MSPTS and East Trenches Plume Treatment System (ETPTS), eventually led DOE to install a commercial air stripper, adapted to the existing solar/battery power facility, at the ETPTS in 2014–2015. Like the MSPTS, the ETPTS was initially designed to reduce VOC load but was subsequently evaluated against the stricter requirements of the RFLMA standards. Even with fresh ZVI media, these targets were typically not met. A commercial air stripper at the ETPTS replaced the ZVI-based treatment, as documented in RFLMA CR 2012-02 dated October 25, 2012; RFLMA CR 2014-01 dated January 21, 2014; and RFLMA CR 2014-04 dated February 19, 2014. In contrast to the water quality of the ZVI-treated effluent, following completion of the air-stripper installation in January 2015, concentrations of VOCs in ETPTS effluent have met all corresponding RFLMA Table 1 standards (*Annual Report of Site Surveillance and Maintenance Activities at the Rocky Flats Site, Colorado, Calendar Year 2015* [April 2016]). The more effective contaminant treatment resulting from this change will better protect the water quality in South Walnut Creek, including when groundwater flows increase due to significant precipitation events like those in September 2013 and during the wet spring of 2015.

Information on the status of operation and performance of the MSPTS and ETPTS is provided in RFLMA quarterly and annual site surveillance and maintenance reports. RFLMA contact records and site surveillance and maintenance reports are available on the Rocky Flats public website at http://www.lm.doe.gov/rocky_flats/Sites.aspx.

Description of Significant Differences:
The significant difference is the change in the location of groundwater treatment of the Mound Site plume from the MSPTS to the ETPTS. The remedy selected in the CAD/ROD for Mound Site Plume VOC-contaminated groundwater was a passive system using a groundwater intercept trench and treatment for VOC removal at the intercept location. This approach was used at both the ETPTS and the MSPTS. This contact record/ESD changes the treatment of VOC contaminated groundwater collected at the MSPTS to the existing commercial air stripper located at the ETPTS. Therefore, this action will incorporate the water intercept components of two systems (the MSPTS and ETPTS) and treat the combined water with one, more effective treatment component (the air stripper at the ETPTS). This will require the construction of an approximately 1600-foot water transfer line from the MSPTS to the ETPTS influent manhole (see Figure 1), which will transport water collected at the MSPTS to the ETPTS for treatment.

Because the MSPTS itself will no longer perform water treatment but will still perform water collection, the associated MSPTS effluent monitoring location will no longer be applicable. Essentially, combining the two treatment systems into one will require a monitoring change in RFLMA, as identified in RFLMA CR 2015-04 dated July 8, 2015. The MSPTS effluent

monitoring location will be changed from MOUND R2-E to the combined ETPTS and MSPTS effluent monitoring location, currently labeled ET EFFLUENT.

Based on DOE's evaluation of the combined ETPTS and MSPTS influent VOC concentrations and flow rates, the amounts and types of VOCs that the air stripper will volatilize to the air will remain below the requirements of an Air Pollutant Emission Notice (APEN) under the Colorado Air Quality Regulations. Therefore, an APEN will not be required.

Discussion:
The design of the infrastructure required to implement the MSPTS reconfiguration project is complete. The design routes the collected groundwater at the MSPTS to the ETPTS influent manhole (see Figure 1). The existing MSPTS ZVI-filled treatment cells will be emptied and modified for optional groundwater storage. The existing MSPTS effluent manhole will be replaced with a lift station and pump. Water intercepted by the MSPTS groundwater intercept trench will flow to this new lift station, and will then be pumped in batches to the ETPTS influent manhole through an approximately 1600-foot-long transfer line. The combined MSPTS and ETPTS influents will then flow to the ETPTS Influent Tank, from which the water will be pumped (in batches) to the ETPTS air stripper for treatment (as is currently the case with ETPTS influent).

Additional solar and battery power will be added to the existing ETPTS power facility to enable the air stripper to operate for longer periods, thereby treating the greater volume of water represented by the combined ETPTS and MSPTS influents. The additional batteries will be installed within the existing conex, which houses the existing batteries and acts as the platform for the main solar panel array. The additional solar resources will include two pole-mounted solar panel arrays. Each of these pole-mounted arrays will require a concrete foundation (see Figure 1) set in an excavation that will be approximately 4 feet by 4 feet and 9 feet deep. Piping, valves, instrumentation, and other necessary components will be installed at the existing MSPTS. These components will require an excavation approximately 6 to 10 feet deep, 10 feet wide, and 20 feet long. The MSPTS lift station installation will require an excavation approximately 10 feet by 10 feet and 10 feet deep. The existing MSPTS solar array will not be disturbed; however, the battery box and associated concrete pad will be removed (to make way for the planned excavations and other work) and replaced with new components. All of these excavations are in pre-disturbed areas.

The transfer line between the MSPTS lift station and the ETPTS influent manhole will require excavating a trench approximately 1600 feet long, 2 feet wide, and 4 to 6 feet deep. Other, less intrusive appropriate installation methods, such as horizontal directional drilling, may be used. This trench will be installed as near to the southern edge of the ETPTS access road as practicable. Depths will vary to ensure the proper gradient is maintained. Pipe cleanouts will be installed every 200 feet, and a bollard will be installed adjacent to the transfer line at each cleanout for protection.

As described above, this excavation work will exceed the 3-foot depth limit specified in RFLMA institutional control (IC) 2 (RFLMA, Attachment 2, Table 4, Control 2) as shown in Table 1 below, and so the required Soil Disturbance Review Plan is being submitted with this contact record for regulatory approval.

Table 1. IC 2 from RFLMA, Attachment 2, Table 4, "Institutional Controls for the Central Operable Unit"

Controls	Use Restrictions
IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination. **Rationale:** Contaminated structures, such as building basements, exist in certain areas of the Central OU [Operable Unit], and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.

The required Soil Disturbance Review Plan is in Attachment 1.

The MSPTS is expected to be shut down for several weeks to accomplish the work. Any water that interferes with the construction activities will need to be managed during the performance of the project. Treated water that is present within the treatment cells when the MSPTS is taken offline will be pumped out to the MSPTS effluent discharge gallery. Groundwater seeping into the excavation at the MSPTS will be pumped to the ground upgradient (generally south) of the MSPTS so that it may infiltrate and be recollected by the MSPTS groundwater intercept trench. If water that collects in the MSPTS intercept trench needs to be managed to reduce the water level in the trench, it will be transferred to the East Trenches Plume Treatment System as discussed in RFLMA CR 2011-01 or pumped upgradient of the MSPTS intercept trench. The ETPTS will also be shut down, for a shorter period, to complete electrical work and to connect the transfer line into the EPTTS influent manhole. The ETPTS groundwater intercept trench will store this water during that outage.

Rainfall and storm water run-on water that enters the trench excavated for the transfer line will be pumped to ground in a manner that is consistent with the site's approved erosion control plan. Groundwater seeping into that portion of the excavation that is generally upgradient (south) of the ETPTS intercept trench will be either (1) pumped to ground upgradient of the ETPTS intercept trench in a manner consistent with the site's approved erosion control plan or (2) containerized and decanted in the ETPTS Influent Tank for treatment.

Resolution: CDPHE has reviewed information regarding the proposed soil disturbance and excavation and, after consulting with EPA, has approved this proposed activity. CDPHE has determined that the proposed activity will not compromise or impair the function of the remedy or result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined that the proposed project meets the rationale and objectives of IC 2. EPA has determined the modified remedy continues to satisfy the requirements of CERCLA Section 121.

Considering the changes that have been made to the selected remedy, CDPHE and EPA have determined the remedy remains protective of human health and the environment, complies with federal and state requirements that were identified in the CAD/ROD as applicable or relevant and appropriate to the remedial action at the time the CAD/ROD was signed and is cost-effective. In addition, the revised remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for the site.

The work will not start until after CDPHE's approval, and in any case DOE will not begin the approved soil disturbance until 10 calendar days after this contact record is posted on the Rocky Flats site public website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

Closeout of Contact Record: This contact record will be closed when the work is completed and post-construction revegetation and erosion controls are in place.

Contact Record Prepared by: David Ward and John Boylan, Navarro

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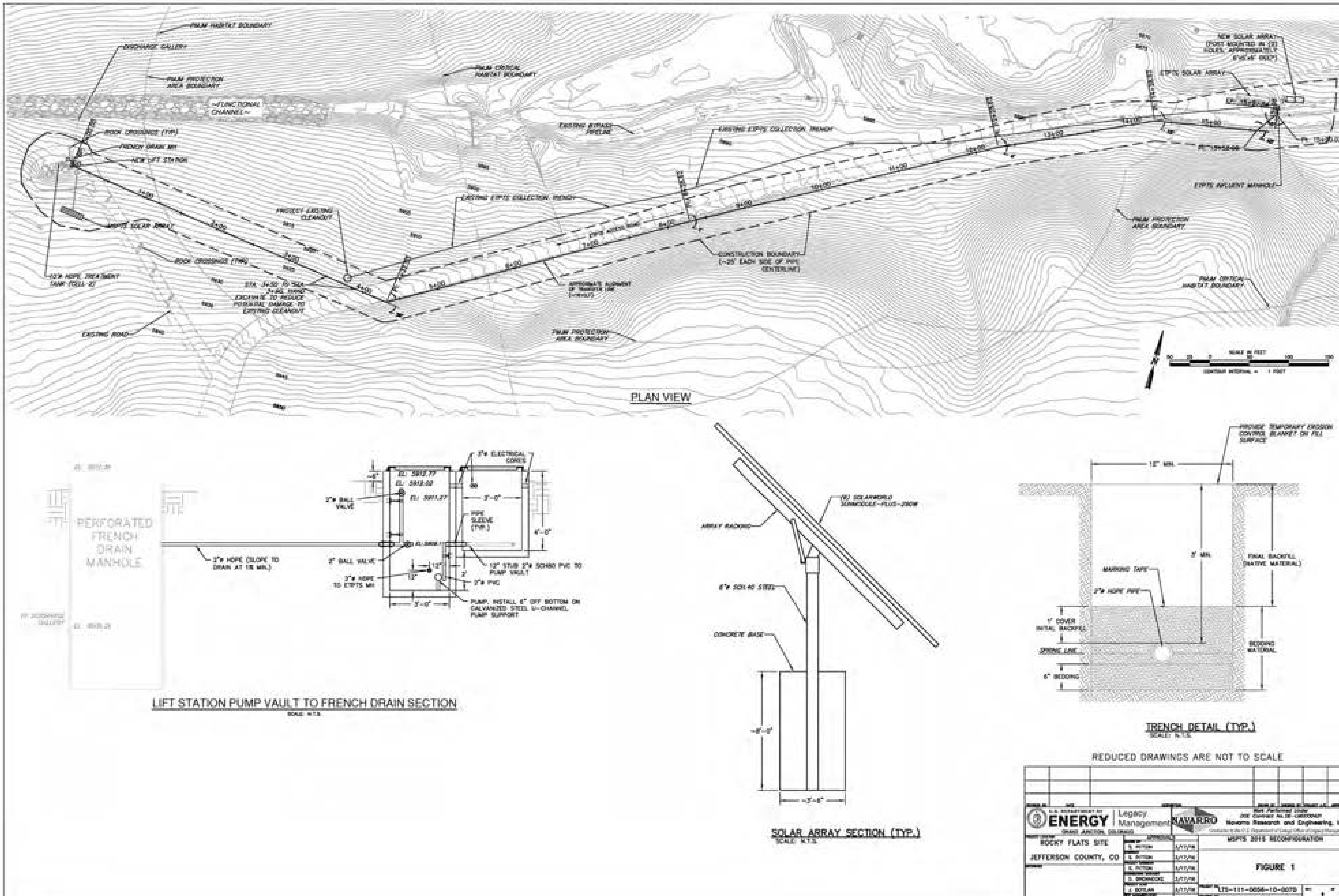
Distribution:
Carl Spreng, CDPHE
Scott Surovchak, DOE
Vera Moritz, EPA
Linda Kaiser, Navarro
Rocky Flats Contact Record File
Rocky Flats Administrative Records


PLAN VIEW
FUNCTIONAL CHANNEL
ROCK CROSSINGS (TYP)
FRENCH DRAIN MH
NEW LIFT STATION
DISCHARGE GALLERY
EXISTING ROAD
CONSTRUCTION BOUNDARY (~25' EACH SIDE OF PIPE CENTERLINE)
EXISTING ETPTS COLLECTION TRENCH
ETPTS INFLUENT MANHOLE
NEW SOLAR ARRAY
PERFORATED FRENCH DRAIN MANHOLE
LIFT STATION PUMP VAULT TO FRENCH DRAIN SECTION
2" BALL VALVE
PIPE SLEEVE (TYP.)
ARRAY RACKING
6" SCH.40 STEEL
CONCRETE BASE
SOLAR ARRAY SECTION (TYP.)
PROVIDE TEMPORARY EROSION CONTROL BLANKET ON FILL SURFACE
12" MIN.
5' MIN.
MARKING TAPE
2"ø HDPE PIPE
FINAL BACKFILL (NATIVE MATERIAL)
BEDDING MATERIAL
SPRING LINE
6" BEDDING
TRENCH DETAIL (TYP.)
REDUCED DRAWINGS ARE NOT TO SCALE
ENERGY Legacy Management
NAVARRO
Navarro Research and Engineering, Inc.
ROCKY FLATS SITE
JEFFERSON COUNTY, CO
MSPTS 2015 RECONFIGURATION
FIGURE 1

Attachment 1

Rocky Flats Legacy Management Agreement (RFLMA)
Soil Disturbance Review Plan (SDRP)

Proposed Project: Mound Site Plume Treatment System (MSPTS) reconfiguration project.

This SDRP provides information required by RFLMA Attachment 2, "Legacy Management Requirements," Section 4.1, "Soil Disturbance Review Plan," regarding the work proposed by DOE.

(1) Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The MSPTS is being reconfigured such that intercepted groundwater will be transferred to the ETPTS for treatment, rather than being treated at the MSPTS. This is because the commercial air stripper installed in 2014–2015 at the ETPTS is much more effective at removing contaminants than is the ZVI originally used to treat the water (and still in use at the MSPTS). The reconfiguration project will require excavating around the MSPTS treatment cells and effluent manhole to make plumbing modifications and to replace the effluent manhole with a lift station; excavating and installing a water transfer line from this lift station to the ETPTS influent manhole; and excavating at the ETPTS solar/battery power facility to install two new pole-mounted solar arrays. Excavations will range from approximately 4 feet to 6 feet deep for lift station and pipe trench and 9 feet deep for the solar array foundations. See Figure 1, attached, for additional information.

(2) Information about any remaining subsurface structures in the vicinity of the proposed project.

Other than components of the MSPTS and ETPTS, there are no remaining subsurface structures in the vicinity, so cover assumptions will not be violated.

(3) Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern, or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

This construction area was not an IHSS. In the *Facility Investigation - Remedial Investigation/Corrective Measures Study - Feasibility Study Report for the Rocky Flats Environmental Technology Site* (June 2006), the figures in Section 3, "Nature and Extent of Soil Contamination," do not indicate soil contamination in this area. Groundwater in some (not all) of the areas involved in this construction work is impacted by the Mound Site and East Trenches plumes. Any groundwater that is encountered in an excavation will be managed as described in CR 2016-02.

(4) Resurvey any new surface established in subsurface soil, unless sufficient existing data is available to characterize the surface (or state that the excavated soil will be replaced and the original contours restored).

The lift station at the MSPTS will be installed in the approximately 10-foot × 10-foot × 10-foot deep excavation, and the surrounding area will be graded to approximately 6 inches below the top of the vault walls. The excavations for the new pole-mounted PV solar arrays at the ETPTS power facility will be filled with concrete and the surrounding surface will be returned to the existing grade or higher. All excavations for pipe and valve installations will be returned to grade. Therefore the area will be returned to its approximate original contours.

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2016-03

Purpose: Geoprobe Investigation of the Groundwater System Upgradient of the Original Landfill and the Soil Disturbance Review Plan

Contact Record Approval Date: July 28, 2016

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Clay Carpenter, Linda Kaiser, David Ward, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Date of Consultation Meeting: July 18, 2016

Consultation Meeting Participants: Scott Surovchak, DOE; Carl Spreng, CDPHE; Vera Moritz, EPA; Clay Carpenter, Linda Kaiser, John Boylan, George Squib, David Ward, Michelle Hanson, Navarro

Introduction: Contact Record (CR) 2015-03, May 26, 2015, approved immediate action to address areas of subsidence and the resulting standing water on portions of the surface of the Original Landfill (OLF). This subsidence was caused by several weeks of precipitation in the spring of 2015. (May 2015 has been noted as the wettest May in Colorado's recorded history.) The immediate action was successful in improving drainage of water on the surface of the OLF. In September 2015, CR 2015-06 approved an action to contour the East Perimeter Channel (EPC) and the eastern edge and western side of the OLF to reestablish surface water flow off the OLF cover towards Woman Creek, and lay back a large scarp at the top of the EPC as a short-term action. However, in the spring of 2016, the EPC and some of the surrounding area slumped, but not as significantly as in 2015. Therefore, the slope instability continues as an ongoing issue.

The slope instability has been investigated by geotechnical consultants who determined that the instability at the OLF can be attributed to three factors:

- Comparatively weak soils that naturally underlie the OLF area
- A slope angle that is sufficiently steep such that the soils can mobilize downslope
- Water is introduced into the already weak soils from one or more sources, including surface run-on and runoff, precipitation and infiltration, and groundwater

Of these three factors, groundwater appears to have the greatest potential impact on slope stabilization of the EPC and eastern edge and western side of the OLF. Moreover, unlike the other two factors, there are potential options that could be implemented to improve stability by reducing the volume of water entering the OLF. The slumping is most significant in the spring

when overall site groundwater levels are elevated; however, characteristics of the groundwater system that directly influence the OLF are not well understood. The purpose of this investigation is to provide additional information on the groundwater system in the areas that likely have the greatest contribution to the slumping in the OLF.

Discussion:

Proposed Approach: A Geoprobe (a direct push drilling rig) will be used to better identify the expected conduits of groundwater flow and to install small wells or piezometers in these areas to better understand the characteristics of groundwater. The investigation area upgradient of the OLF is identified in Figure 1. The number of potential holes will vary, depending on field results, from 10 to 50 holes that will be from 5 to 50 feet in depth. Specifically, the Geoprobe will be used to (1) confirm the expected three locations of abandoned piping/bedding materials that may be conduits for groundwater to enter the OLF; (2) install small wells in these conduits to track the movement of the water table; (3) install small wells above the eastern portion of the OLF where the most significant slumping has occurred; (4) install a small well west of the OLF near the abandoned gas line, which may be a conduit for groundwater flow entering the area; and (5) evaluate the water quality in areas that may later be disturbed or where groundwater may be removed as part of the long-term improvements. In all cases, the Geoprobe will be used on the flat bench above the OLF and outside of the waste footprint. This effort is expected to take approximately 2 weeks.

Expected Outcome/Endpoints: This effort is expected to (1) make the identification of the location of the abandoned infrastructure more accurate to better guide a potholing or water removal project that may be done in the future; (2) provide water level data targeted on the areas that likely contribute the most significant volumes of groundwater to the OLF; and (3) help DOE better understand water quality for potential future water management projects. Overall, the information gathered from this effort will be critical in determining the most effective long-term solutions for minimizing the slumping that is occurring at the OLF.

As described above, this excavation work will exceed the 3-foot depth limit specified in the Rocky Flats Legacy Management Agreement (RFLMA) institutional control (IC) 2 (RFLMA, Attachment 2, Table 4, Control 2) as shown in Table 1 below, and the required Soil Disturbance Review Plan is submitted with this contact record for regulatory approval.

Table 1. IC 2 from RFLMA, Attachment 2, Table 4, "Institutional Controls for the Central Operable Unit"

Controls	Use Restrictions
IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination. **Rationale:** Contaminated structures, such as building basements, exist in certain areas of the Central OU [Operable Unit], and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.

The required Soil Disturbance Review Plan is in Attachment 1.

Resolution: Carl Spreng, CDPHE, reviewed the information regarding the proposed soil disturbance and excavation and, has approved this contact record. CDPHE has determined that the proposed activity will not compromise or impair the function of the remedy or result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined that the proposed project meets the rationale and objectives of IC 2.

DOE will not begin the approved soil disturbance until 10 calendar days after this contact record is posted on the Rocky Flats site public website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

After completing the approval process and incorporating any required changes, CDHPE approved this contact record.

Closeout of Contact Record: Initial information from the Geoprobe investigation will be presented in the OLF path forward analysis and reported by DOE in the appropriate quarterly and annual reports of surveillance and maintenance. This contact record will be closed when the field investigation is complete in November 2017 and the area revegetated as needed.

Contact Record Prepared by: David Ward and Clay Carpenter, Navarro

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Distribution:
Carl Spreng, CDPHE
Vera Moritz, EPA
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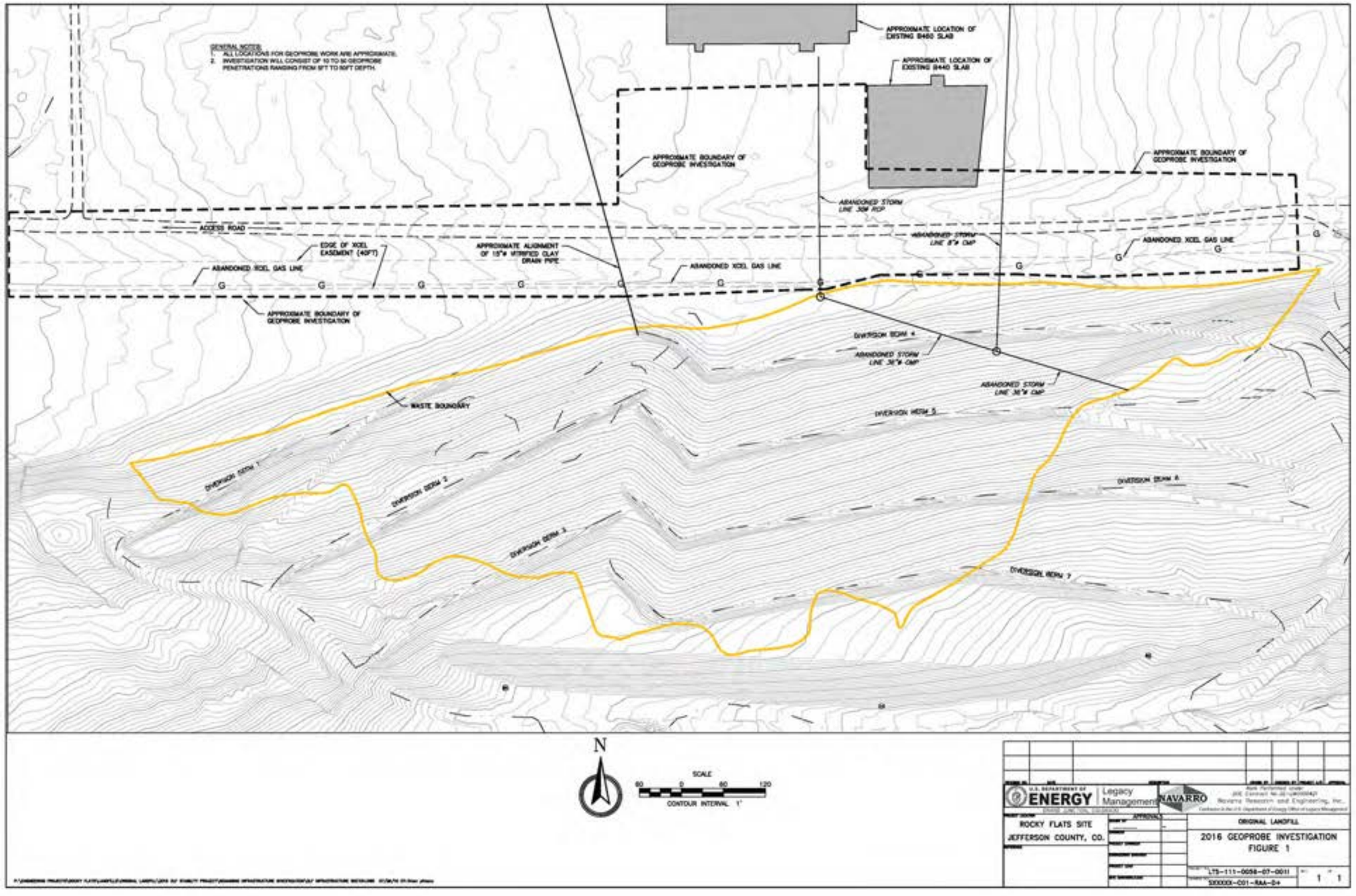
Clay Carpenter, Navarro
Linda Kaiser, Navarro
rc-westminster
File: RFS 0025.02
RF Contact Record File


GENERAL NOTES:
1. ALL LOCATIONS FOR GEOPROBE WORK ARE APPROXIMATE.
2. INVESTIGATION WILL CONSIST OF 10 TO 50 GEOPROBE PENETRATIONS RANGING FROM 5FT TO 50FT DEPTH.
APPROXIMATE LOCATION OF EXISTING B460 SLAB
APPROXIMATE LOCATION OF EXISTING B440 SLAB
APPROXIMATE BOUNDARY OF GEOPROBE INVESTIGATION
APPROXIMATE BOUNDARY OF GEOPROBE INVESTIGATION
ABANDONED STORM LINE 30# RCP
ACCESS ROAD
EDGE OF XCEL EASEMENT (40FT)
ABANDONED XCEL GAS LINE
APPROXIMATE ALIGNMENT OF 15"ø VITRIFIED CLAY DRAIN PIPE
ABANDONED XCEL GAS LINE
ABANDONED STORM LINE 8"ø CMP
ABANDONED XCEL GAS LINE
APPROXIMATE BOUNDARY OF GEOPROBE INVESTIGATION
DIVERSION BERM 4
ABANDONED STORM LINE 36"ø CMP
ABANDONED STORM LINE 36"ø CMP
WASTE BOUNDARY
DIVERSION BERM 5
DIVERSION BERM 1
DIVERSION BERM 2
DIVERSION BERM 3
DIVERSION BERM 6
DIVERSION BERM 7
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SCALE
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CONTOUR INTERVAL 1'
U.S. DEPARTMENT OF ENERGY | Legacy Management
NAVARRO
Work Performed under DOE Contract No. DE-SM0004927
Navarro Research and Engineering, Inc.
Contractor to the U.S. Department of Energy Office of Legacy Management
ROCKY FLATS SITE
JEFFERSON COUNTY, CO.
ORIGINAL LANDFILL
2016 GEOPROBE INVESTIGATION
FIGURE 1
LTS-111-0058-07-0011
SXXXXX-C01-RAA-D+
1 1

Attachment 1

Rocky Flats Legacy Management Agreement (RFLMA)
Soil Disturbance Review Plan (SDRP)

Proposed Project: SDRP for Geoprobe Investigation of the Groundwater System Upgradient of the Original Landfill

This SDRP provides information required by RFLMA Attachment 2, "Legacy Management Requirements," Section 4.1, "Soil Disturbance Review Plan," regarding the work proposed by DOE.

(1) Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

A Geoprobe (a direct push drilling rig) will be used to better identify the expected conduits of groundwater flow and to install small wells or piezometers in these areas to better understand the characteristics of groundwater. The investigation area upgradient of the OLF is identified in Figure 1. The number of potential holes will vary, depending on field results, from 10 to 50 holes that will be from 5 to 50 feet in depth. Specifically, the Geoprobe will be used to (1) confirm the expected three locations of abandoned piping/bedding materials that may be conduits for groundwater to enter the OLF; (2) install small wells in these conduits to track the movement of the water table; (3) install small wells above the eastern portion of the OLF where the most significant slumping has occurred; (4) install a small well west of the OLF near the abandoned gas line, which may be a conduit for groundwater flow entering the area; and (5) evaluate the water quality in areas that may later be disturbed or where groundwater may be removed as part of the long-term improvements. In all cases, the Geoprobe will be used on the flat bench above the OLF and outside of the waste footprint. This effort is expected to take approximately 2 weeks.

(2) Information about any remaining subsurface structures in the vicinity of the proposed project.

As indicated in Figure 1, the slab foundation for Building 460, Consolidated Non-Nuclear Manufacturing Building, lies to the north of the investigation area. The southern edge of the foundation for Building 440, Modification Center Non-Nuclear Building, lies just inside the investigation area. The following abandoned or removed utilities cross through the investigation area: sanitary sewers, electrical power lines, alarm lines, raw water lines, and culverts and storm water drains. It is anticipated that these abandoned utilities may be encountered during the Geoprobe investigation; in fact it is one of the intentions of the investigation to Geoprobe into the storm water drains as appropriate. There is an Xcel Energy abandoned gas line in the investigation area and the Geoprobe investigation near that line will be coordinated with Xcel Energy.

(3) Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern (PACs), or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

IHSS 400-157.2, Radioactive Site South Area, lies to the north and outside of the investigation area; therefore, there will be no material from that area in the investigation area. The Industrial Area volatile organic compound plume lies below portions of the Geoprobe investigation area. The investigation will not affect this plume.

(4) Resurvey any new surface established in subsurface soil, unless sufficient existing data is available to characterize the surface (or state that the excavated soil will be replaced and the original contours restored).

The surface around any wells will be left at the existing grade and construction areas will be returned to the original grade.

ROCKY FLATS SITE
REGULATORY CONTACT RECORD 2016-04

Purpose: Upgrade of the East Subsurface Drain Located in the East Perimeter Channel of the Original Landfill, with Soil Disturbance Review Plan

Contact Record Approval Date: October 19, 2016

Site Contact(s)/Affiliation(s): Scott Surovchak, U.S. Department of Energy (DOE); Linda Kaiser, David Ward, Clay Carpenter, and Jeremy Wehner, Navarro Research and Engineering, Inc. (Navarro)

Regulatory Contact(s)/Affiliation(s): Carl Spreng, Colorado Department of Public Health and Environment (CDPHE); Vera Moritz, U.S. Environmental Protection Agency (EPA)

Dates of Consultation Meeting: July 18, September 20, and October 12, 2016

Consultation Meeting Participants: Scott Surovchak, DOE; Carl Spreng, CDPHE; Vera Moritz, EPA; Clay Carpenter, Linda Kaiser, John Boylan, George Squib, David Ward, and Michelle Hanson, Navarro

Introduction:

The actions described in this contact record should improve the diversion of groundwater away from the East Perimeter Channel (EPC) by repairing and upgrading the East Subsurface Drain (ESSD) in the NE corner of the Original Landfill (OLF) so that it functions as intended and is less likely to clog. These actions are consistent with the investigation done under the Rocky Flats Legacy Management Agreement (RFLMA) Contact Record (CR) 2016-03.

The purpose of the investigation approved in CR 2016-03 (installation of wells and piezometers with a Geoprobe) was to provide additional information about the groundwater regime in the areas that potentially have the greatest contribution to the slumping in the OLF. CR 2016-03 states that geotechnical consultants have determined that slope instability at the OLF can be attributed to three factors:

1. Comparatively weak soils that naturally underlie the OLF area;
2. A slope angle that is sufficiently steep such that the soils can mobilize downslope; and
3. Water that is introduced into the already weak soils from one or more sources, including surface run-on and runoff, precipitation and infiltration, and groundwater.

Of these three factors, options for reducing the volume of water entering the OLF area are the most practical.

The ESSD was installed in the northeast corner of the EPC during site closure as a field modification of the OLF area to intercept and divert groundwater away from the northeastern portion of the OLF during construction of the EPC and the eastern portion of the final land surface of the OLF area. The ESSD is upgradient of the area that exhibited the most significant slumping in 2016, and it no longer operates as installed. The ESSD was constructed as a rock drain with no geotextile filter fabric to reduce the potential for clogging. The drain cannot be cleaned without excavating it. It is not certain when the ESSD stopped working, but very little water, if any, flows out of the drain. The excavation of portions of the ESSD in the summer of 2015 (performed under CR 2015-06) failed to provide an outlet for water that might have been collecting in the buried rock drain.

Discussion:

Based on the information above, the ESSD needs to be repaired and upgraded so that it properly functions and is less likely to clog. This action should be completed before the spring of 2017, when groundwater levels are again anticipated to rise and additional hillside movement is more likely. The repair and upgrade include excavating and replacing approximately 134 feet of the 234 feet of existing clogged rock drain and replacing the westernmost 100 feet of the original ESSD with a segment that is slightly south of the current drain alignment (see Figure 1). This realignment will avoid digging in the steepest portion of the slope. The total length of the excavation will be approximately 234 feet, and it will range from a depth of approximately 15 feet at the upgradient end to zero feet where the drain daylights. An 8-inch perforated pipe, with cleanout risers appropriately located for observation and cleanout, will be contained within a gravel bed that will be wrapped in geotextile filter fabric as shown in Figure 1. The pipe and cleanouts will allow the continued maintenance of the drain and will therefore extend its operable lifetime. The trench that is excavated for this work will be entirely outside the waste footprint but inside the original OLF construction boundary. Some construction equipment may be placed on the OLF cover above the waste footprint to safely install the upgraded ESSD.

A portion of the repair and upgrade work to the ESSD will be performed in an already disturbed Preble's meadow jumping mouse critical habitat, within the OLF original construction boundary (see Figure 1). As required by the United States Fish and Wildlife Service (USFWS) Biological Opinion for the Preble's meadow jumping mouse at Rocky Flats, the USFWS will be a notified prior to start of construction.

As stated above, the groundwater appears to have the greatest potential impact on slope instability around the EPC and the eastern edge and western side of the OLF. Several stabilization methods are being evaluated, and data are being collected to determine the preferred approach for managing the groundwater before it enters the OLF and for improving the OLF slope stabilization. A second 8-inch pipe (nonperforated) will be installed within the excavated trench in case the alternative that is eventually selected to manage groundwater requires a method to convey groundwater from upgradient of the OLF to the hillside east of the OLF (see Figure 1). Precisely how or if this second pipe eventually would be used has not been determined; additional data must be collected and geotechnical conclusions evaluated before any approach to groundwater diversion can be finalized. However, it is most efficient to install this pipe as part of the ESSD action rather than to dig up the area again to install the pipe. This second pipe will be installed with an inlet riser located at the upgradient end of the pipe, about where the upgraded ESSD turns southeast (Figure 1).

IC Evaluation: The soil disturbance work is subject to Institutional Controls (ICs) 2, 3, and 6. Table 1 recaps these ICs.

Table 1. Institutional Controls

IC 2	Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent unacceptable exposure to residual subsurface contamination. **Rationale:** Contaminated structures, such as building basements, exist in certain areas of the Central OU (Central Operable Unit), and the Comprehensive Risk Assessment did not evaluate the risks posed by exposure to this residual contamination. Thus this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.
IC 3	No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Soil disturbance that will not restore the soil surface to preexisting grade or higher may not be performed without prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2.
	Objective: Prevent migration of residual surface soil contamination to surface water. **Rationale:** Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the Remedial Investigation as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.
IC 6	Digging, drilling, tilling, grading, excavation, construction of any sort (including construction of any structures, paths, trails, or roads), and vehicular traffic are prohibited on the covers of the Present Landfill and the Original Landfill, except for authorized response actions.
	Objective: Ensure the continued proper functioning of the landfill covers. **Rationale:** This restriction helps ensure the integrity of the landfill covers.

The required Soil Disturbance Review Plan (SDRP) for IC 2 is in Attachment 1. The *Erosion Control Plan for Rocky Flats Property Central Operable Unit*, which has been approved by CDPHE and EPA, provides erosion control best-management practices that meet the IC 3 requirements. Construction equipment may need to be positioned on the cover over the easternmost portion of the OLF waste footprint in order to construct the west end of the upgraded ESSD. Approval of this contact record provides authorization for this response action as required by IC 6.

Resolution: CDPHE reviewed the information regarding the proposed soil disturbance and excavation and after consultation with EPA, has approved this contact record. CDPHE has determined that the proposed activity will not compromise or impair the function of the remedy or result in an unacceptable release or exposure to residual subsurface contamination. CDPHE has also determined that the proposed project meets the rationale and objectives of IC 2 (IC 3 and IC 6 rationale and objectives have been addressed as stated above).

The work will be conducted after CDPHE's approval, but DOE will not conduct the approved soil disturbance until 10 calendar days after this Contact Record is posted on the Rocky Flats Site's website and stakeholders are notified of the posting in accordance with the RFLMA Public Involvement Plan.

Progress and the completion of the work will be reported by DOE in RFLMA quarterly and annual reports of surveillance and maintenance activities for period(s) in which these activities occur.

Closeout of Contact Record: This contact record will be closed when the construction is completed, post-construction reseeding has been performed, and post-construction erosion controls are in place.

Contact Record Prepared by: David Ward, Clay Carpenter, and Jeremy Wehner, Navarro

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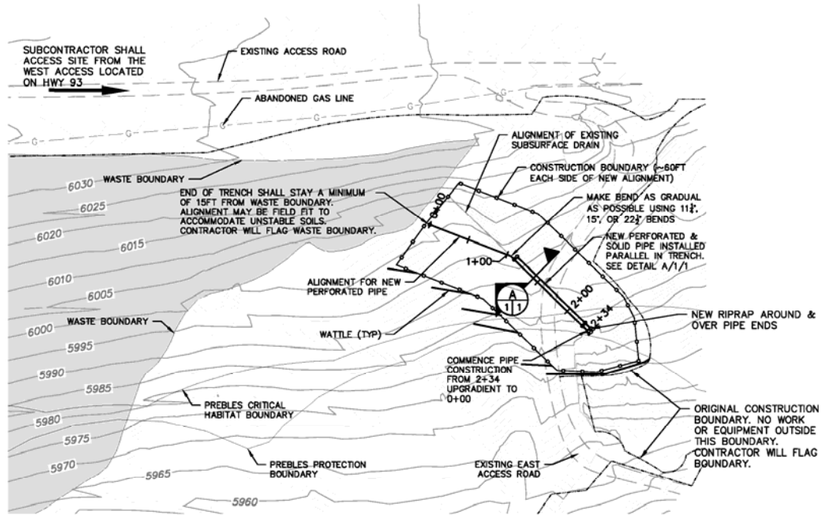
File: RFS 0025.02
RF Contact Record File



ORIGINAL LANDFILL PLAN

N

SCALE IN FEET
80 40 0 80 160 240

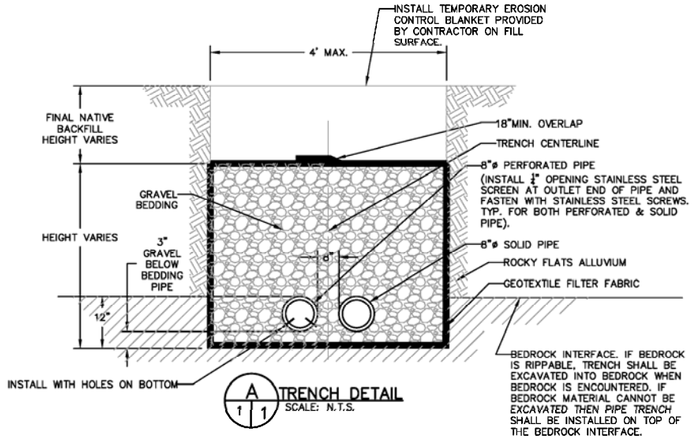
CONTOUR INTERVAL = 1 FEET

NOTES:

1. FIELD FIT ALIGNMENT AND LOCATIONS OF THE VERTICAL PIPES PER CONTRACTOR DIRECTION.
2. NATIVE BACKFILL SHALL BE COMPACTED IN 8" LOOSE LIFTS WITH THREE PASSES OF A VIBRATORY ROLLER. MOISTURE CONDITION BACKFILL AS NECESSARY TO PROVIDE COHESION OF BACKFILL TO CONTRACTORS SATISFACTION.
3. NO EXCAVATION SHALL TAKE PLACE INSIDE WASTE BOUNDARY.
4. INSTALL ACCESS-CONTROL FENCING ALONG CONSTRUCTION BOUNDARY TO RESTRICT ACCESS BY UNAUTHORIZED PERSONNEL INTO THE PROJECT WORK AREA. FENCING SHALL BE MINIMAL AND ONLY PLACED AROUND THE WORK AREAS. ACCESS-CONTROL FENCING SHALL, AT A MINIMUM:
   - BE 4 FT IN HEIGHT.
   - POSTS SET 10 FOOT ON CENTERS.
   - HIGH VISIBILITY PLASTIC, SAFETY FENCING OR APPROVED EQUAL.
   - POSTS AND FABRIC SHALL BE SECURE AND TIGHT AT ALL TIMES.
5. GEOTEXTILE FILTER FABRIC SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS. PROVIDE 18" OVERLAP ON ALL SEAMS. MATERIAL WILL BE PROVIDED BY CONTRACTOR.
6. GRAVEL BEDDING SHALL BE IN ACCORDANCE WITH CDOT 2011 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 703.02, COARSE AGGREGATE FOR CONCRETE, GRADATION NO. 67.
7. REMOVE EXISTING ROCK DRAIN WHEN ENCOUNTERED AND PLACE REMOVED MATERIAL AT CONTRACTOR'S STOCKPILE AREA.
8. ALL PIPE SHALL BE HDPE PE4710 DR 17 WITH BUTT FUSION WELDED JOINTS. PERSONNEL PERFORMING THE PIPE WELDING SHALL BE A MANUFACTURE'S AUTHORIZED TRAINED FUSION TECHNICIAN. WELDING QUALIFICATIONS AND PIPE MATERIAL PRODUCT SHEET SHALL BE SUBMITTED TO THE CONTRACTOR.
9. PERFORATED PIPE SPECIFICATIONS:

NOMINAL PIPE SIZE	HOLE SIZE	LONGITUDINAL HOLE SPACING	PERIMETER HOLE SPACING
8"	3/8"	5" +/- ½"	2@120° (+/-5°)

10. INSTALL PIPE FROM DOWN GRADIENT (STATION 2+34) TO UPGRADIENT (0+00)
11. INSTALL D50 = 6 INCH RIPRAP AT OUTLET END OF DRAIN LINE. BLEND WITH EXISTING RIPRAP.
12. PLACE WATTLES ALONG THE SOUTHERN EDGE OF THE CONSTRUCTION BOUNDARY AND MAINTAIN THROUGHOUT THE DURATION OF CONSTRUCTION. MATERIAL WILL BE PROVIDED BY CONTRACTOR.



TRENCH DETAIL

SCALE: N.T.S.

FIGURE 1

REVISION NO.	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	PROJECT A/E	APPROVED

U.S. DEPARTMENT OF ENERGY | Legacy Management
GRAND JUNCTION, COLORADO

Work Performed Under DOE Contract No. DE-LM0000421
NAVARRO Navarro Research and Engineering, Inc.
Contractor to the U.S. Department of Energy Office of Legacy Management

PROJECT LOCATION: ROCKY FLATS SITE GOLDEN, COLORADO

REFERENCE

APPROVALS		
DRAWN BY	S. PITTON	9/29/16
CHECKED	S. PITTON	9/29/16
PROJECT ENGINEER	S. PITTON	9/29/16
CONSTRUCTION MANAGER	D. BRENNECKE	9/29/16
PROJECT LEAD	J. WEHNER	9/29/16
SITE MANAGER/LEAD	L. KAISER	9/29/16

DLF EAST SUBSURFACE DRAIN UPGRADE

PLAN, PROFILE, DETAILS

PROJECT NO. LTS-111-0056-07-001K
DRAWING NO. S15057-R00-C01-D
SHT. 1 OF 1

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RFLMA Contact Record 2016-04

Attachment 1

Rocky Flats Legacy Management Agreement Soil Disturbance Review Plan

Proposed Project: Soil Disturbance Review Plan (SDRP) for the upgrade of the East Subsurface Drain (ESSD) located in the East Perimeter Channel (EPC) of the Original Landfill (OLF)

This SDRP provides information required by Rocky Flats Legacy Management Agreement (RFLMA) Attachment 2, "Legacy Management Requirements," Section 4.1, "Soil Disturbance Review Plan," regarding the work proposed by the U.S. Department of Energy.

Description of the proposed project, including the purpose, the location, and the lateral and vertical extent of excavation.

The proposed project is to repair and upgrade the clogged ESSD located in the northeast corner of the EPC of the OLF. It will include digging up a portion of the existing rock ESSD, which is approximately 15 feet below surface at its deepest location and runs approximately 234 feet to its zero-depth riprap outlet. A new 8-inch perforated pipe for collecting groundwater in that area and diverting it away from the OLF and EPC will be installed. Also, a new solid 8-inch pipe will be installed with an inlet riser for possible future use as a method for conveying groundwater from upgradient of the OLF to the South Interceptor Ditch SID. Both pipes will be buried together in graded gravel wrapped in a geotextile filter fabric (see Figure 1).

Information about any remaining subsurface structures in the vicinity of the proposed project (or state that there are none if that is the case).

There are no remaining subsurface structures in the vicinity of the proposed project. An abandoned buried natural gas line operated by Xcel Energy is in the utility easement corridor north of the OLF. The location and alignment of this abandoned line is well known and marked with signs. It is well outside of the soil disturbance area.

Information about any former Individual Hazardous Substance Sites (IHSSs), Potential Areas of Concern, or other known or potential soil or groundwater contamination in the vicinity of the proposed project.

The OLF is former IHSS 115. The OLF design had a 2-foot-thick soil cover over the location of the disposed waste materials and clean Rocky Flats Alluvium fill surrounding the waste materials for the placement and configuration of stormwater and seep-water management features. Limits of the waste area are shown in Contact Record 2016-04 Figure 1. The work that will be conducted to repair and upgrade the ESSD will not extend into the waste footprint. Work instructions are in place to appropriately manage any debris if encountered during this response action.

Contaminated groundwater of the "Industrial Area Plume" is present in the subsurface upgradient of the work area. This area of the plume is characterized by low (part-per-billion) concentrations of volatile organic compounds (VOCs). The recently installed wells and piezometers (CR 2016-03) that are upgradient of the construction area will be sample and analyzed for VOCs to support the evaluation of worker safety – primarily, potential exposures to workers during repair and upgrading of the ESSD, and for associated personal protective equipment (PPE) to be used when handling excavated materials or working in the excavation.

The project area is in the Upper Woman Creek Drainage Exposure Unit (EU) evaluated in the Comprehensive Risk Assessment, Appendix A, of the Remedial Investigation/Feasibility Study. The only contaminants of concern (COCs) identified for this EU are benzo[*a*]pyrene and dioxins/furans for surface soil/surface sediment.

Dioxin/furan concentrations were converted to 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) toxicity equivalents (TEQs) for COC screening and risk characterization. Noncancer risks for benzo[*a*]pyrene and 2,3,7,8-TCDD TEQ were not evaluated because those COCs do not have noncancer toxicity values. Risks were calculated for benzo[*a*]pyrene and 2,3,7,8 TCDD TEQ. The estimated total excess lifetime cancer risk to the wildlife refuge worker at the EU is 8E-06.It is important to note that samples with the highest benzo[*a*]pyrene concentrations are located in an area that is now under 20 feet of soil following the closure of the OLF (i.e., re-grading and constructing the OLF cover). The dioxin/furan and benzo[a]pyrene are present in areas within the waste footprint, and therefore those contaminants are vertically and laterally separated from the excavation described in this contact record. There were no COCs identified for subsurface soil or subsurface sediment in this EU.

Appendix E

Groundwater and Surface Water Monitoring

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