TRI-PARTY AGREEMENT

Change Notice Number TPA-CN- 0842	TPA CHANGE NOTICE FORM	Date: 03/06/2019
Document Number, Title, and Revision: DOE/RL-2009-80, *Investigation-Derived Waste Purgewater Management Work Plan*, Rev. 0		Date Document Last Issued: 09/09/2009
Approved Change Notices Against this Document: TPA-CN-325, -442, -466, -528, -552, -564, -574, -670, and -0779		
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Description of Change:
DOE/RL-2009-80 is amended to allow for purgewater managed at the Modular Storage Units (MSU) to be decanted and shipped to the 200 West Pump & Treat (200W P&T).

M.W. Cline and E. Laija agree that the proposed change
DOE **Lead Regulatory Agency**
modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, *Documentation and Records,* and not Chapter 12.0, *Changes to the Agreement.*

The text will be modified as detailed in the attached redlined change pages. Changes will be for:

- Transporting MSU water to the 200 West Pump and Treat
- Addition of chemicals for control of biological growth and precipitation of suspended minerals
- Maintenance activity of removal of sediment from the MSUs as needed

Additions are shown using double underline. Deletions are shown using ~~strikeout~~.

Note: Include affected page number(s): 1, 2, 8, 9, 10, 14, 21, 27, 28

Justification and Impacts of Change:
An Optimization Pilot Test was conducted per DOE/RL-2018-28 to determine the acceptability of treating MSU water at the 200W P&T. The conclusions of the test in DOE/RL-2018-70 reported that all effluent criteria were met and recommended continued treatment of MSU water at the 200W P&T.

There may be conditions during the operation of the MSUs such that the purgewater levels would be higher than the freeboard requirement [24.4 cm (9.6 inches)] and needed to decant to minimize risk of over-topping or spilling. The work plan currently allows for decanting to another MSU or shipping to the ETF. This change would also allow shipment of the MSU water to the 200W P&T for treatment.

DOE/RL-2011-41 and DOE/RL-2009-124 already allow direct shipment of purgewater to the ETF or pump & treat facilities. This change would clarify in this document that MSU water can be shipped to the 200W P&T.

In conjunction with the changes in this document, changes are being made to DOE/RL-2009-39 and DOE/RL-2009-124.

Approvals:

DOE Project Manager	8/15/2019 Date	[X] Approved [ ] Disapproved
EPA Project Manager	8/19/2019 Date	[X] Approved [ ] Disapproved
N/A Ecology Project Manager	Date	[ ] Approved [ ] Disapproved

1 Introduction

Presently, groundwater is withdrawn from Hanford Site wells for (1) developing newly constructed groundwater monitoring wells, (2) purging existing wells prior to sample collection, (3) aquifer testing, (4) periodic cleaning and renovating existing monitoring wells, and (5) abandoning existing wells. Such withdrawn groundwater is called "purgewater." The purgewater is investigation derived waste and is subject to management in accordance with the terms of Ecology et al. 1989a, *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), which represents, in part, the legal document the U. S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Department of Energy (DOE), Richland Operations Office (RL) have agreed to follow in implementing the National Priorities List (NPL) (40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," [NCP] Appendix B, "National Priorities List") for Hanford work. Current plans for EPA, Ecology, and RL (Tri-Parties) include milestones for continuing Tri-Party Agreement work that drive an increased need for capacity to manage purgewater. Additionally, conditions may exist periodically, such that excess off-specification in-process water may be generated at the 200 West Pump and Treatment Facility, which will need to be managed at the Modular Storage Units.[1]

This work plan contains the pertinent information to support the implementation of DOE/RL-2009-39, *Investigation-Derived Waste Purgewater Management Action Memorandum*, which implements the selected alternative from DOE/RL-2009-31, *Investigation Derived Waste Purgewater Management Engineering Evaluation/Cost Analysis*. This work plan also contains pertinent information from DOE/RL-2011-41, *Hanford Site Strategy for Management of Investigation Derived Waste*. The removal action will consist of re-lining an existing storage unit, building additional units, and operating the units solely for purgewater consolidation and management. Operation of units also includes the transport of water from the units to 200 West Pump and Treat facility by truck or pipeline. These units will be referred to herein as the Modular Storage Units. Eventual demolition of the units is also included in DOE/RL-2009-39, but will not be addressed as part of this work plan. Prior to demolition of the Modular Storage Units, a removal action work plan will be developed for implementation of that action.

As part of this removal action, DOE has designated an On-Scene Coordinator pursuant to the requirements of 40 CFR 300.120, "On-Scene Coordinators and Remedial Project Managers: General Responsibilities," to ensure compliance with the NCP and the Tri-Party Agreement.

The removal action supports minimization of potential releases of hazardous substances from the groundwater wells throughout the Hanford Site that could adversely impact human health and the environment, is protective of site personnel and the environment, and contributes to the efficient performance of any future removal and/or remedial actions.

2 Removal Objectives

The key objective of this removal action will be to remove the potential threat presented by purgewater contaminants that are generated through Tri-Party Agreement work in support of the implementation of remedial actions required by the NCP and Tri-Party Agreement. The specific removal objectives are as follows:

[1] 200 West Area groundwater that will be pumped from the ground for treatment at the 200 West Pump and Treatment Facility is the same groundwater that is pumped from the ground in the 200 West Area for (1) developing newly constructed groundwater wells, (2) purging existing wells prior to sample collection, (3) aquifer testing, (4) periodic cleaning and renovating existing wells, and (5) abandoning existing wells.

- Reduce or eliminate the potential for public exposure to hazardous substances in purgewater above levels that are protective of human health and environment
- Reduce or eliminate the potential for release of hazardous substances from the management of purgewater
- Prevent adverse impacts to cultural and natural resources.

3 Facility, Process and Hazard Descriptions

This action includes the refurbishment of an existing Modular Storage Unit, and the possible construction of three additional units, located adjacent to the operating 600 Area Purgewater Storage and Treatment Facility[2] near the 200 East Area of the Hanford Site near Richland, Washington (Figure 1). The overall action includes eventual demolition of the units, which will be addressed through another work plan.

3.1 Facility Description

The Modular Storage Units will be surrounded by a fence, berm, and graveled roadway; will be supported by a compacted soil bottom; and the walls will be anchored to a concrete perimeter foundation. Also, the facility will have concrete sidewalks, an unloading ramp, and a splash pan (Figure 2). A pump filter skid may be established next to the modular storage units with the ability to pump water to a tanker truck or transfer pipeline.

The Modular Storage Units will consist of a primary and a secondary high-density polyethylene liner separated by a geotextile drainage media supported by metal walls and a structural support as shown in Figure 3. Each tank will be capable of holding at least 3,800,000 L (1,000,000 gal) of purgewater and measures 55.78 m by 55.78 m (183 ft by 183 ft). The drainage media will interconnect with a leachate detection system consisting of a standpipe with measurable depth and sampling capability.

The Modular Storage Units will be constructed by bolting the double-liner system, separated by the geotextile, to a sheet metal backing support with a neoprene batten strip. The metal backing will be supported with a steel support frame bolted to a concrete slab. Seismic support will also be provided by tension cables.

Staging for the vehicles used to transport the purgewater to the Modular Storage Units will also be established.

3.1.1 Leak Detection

The leak detection system will consist of a 10.16 cm (4 in.) polyvinyl chloride capped standpipe connected to the outer liner as shown in Figure 3. The standpipe will be accessible for depth measurements and will be designed to facilitate sampling.

3.1.2 Splash Pan

The splash pan is a trough that holds the discharge hose, similar to concrete conveyance ramps that connect the tankers and the Modular Storage Units. The splash pan supports the hose leading from the trucks to the Modular Storage Units and is designed to drain any spills into the Modular Storage Units.

[2] The 600 Area Purgewater Storage and Treatment Facility (although originally conceived as a multi-unit purgewater management facility that was intended to include the Modular Storage Units and more units) has operated using a single storage unit under *Resource Conservation and Recovery Act of 1976* interim status standards for approximately 19 years.

- Add framework, overlap wall panels, and bolt frames to walls.
- Square-up walls and tape joints on inside of unit after walls are erected.
- Cover bottom of unit with geotextile layer, including a couple inches up each wall.
- Bolt top rails, liner mounting studs, and inside gaskets to framework.
- Install liner making sure it fits tightly into corners and at the foot of wall panels and attach to liner mounting studs.
- Attach gaskets and batten strips to liner mounting studs.
- Anchor framework.
- Install leak detection system.
- Perform acceptance testing after construction completion.

4.2 Operation of Modular Storage Units

Routine operation of the Modular Storage Units includes:

- Inspections of the units
- Measuring freeboard
- Maintenance and removal of sediments
- Measuring water level in leak detection risers
- Tank truck transfers
- Inter-unit transfers
- Removal of excess purgewater

The Modular Storage Units are also equipped with a leak detection system that includes an alarm with audible and visual signals for detected leaks. Waste management activities are a part of routine operation of the Modular Storage Units and are discussed in detail in Section 6.2.

4.2.1 Inspections

Inspections of the Modular Storage Units and the leak detection system are performed for liquid level, leaks in the primary liner, and other containment problems. Each Modular Storage Unit is inspected on a schedule determined by the contents of the unit and its individual operating status. The results of the inspections are documented in facility records. Inspection schedules are as follows:

- Units holding purgewater containing radioactive constituents will be inspected in a manner that meets DOE requirements for inspection of low-level radioactive waste during all periods of such storage.
- Units holding purgewater that exhibiting one or more characteristic of a dangerous waste as defined by WAC 173-303-090, “Dangerous Waste Characteristics,” will be inspected at a minimum of once each operating day during all periods of such storage.
- Units holding purgewater that do not exhibit any characteristic of dangerous waste or holding nonradioactive, nondangerous purgewater will be inspected at a minimum of once weekly to ensure proper and safe management.

Inspections include the following items:

- Visual observation for potential spills or leaks
- Measurement of level in the leak detection system
- High water level, freeboard less than 30.5 cm (12 in.)
- Low water level conditions that could result in the suspension of potentially contaminated sediments accumulated within a Modular Storage Unit
- Documentation of abnormal conditions following existing contractor procedures

4.2.2 Measuring Freeboard

Freeboard is defined as the distance from the water level to the top of the Modular Storage Unit bracket, measured at the corner where the four units converge.

As part of the inspection, the freeboard for each Modular Storage Unit will be measured and recorded. If the markings on the staff gauge are not legible, then the freeboard will be measured using a tape measure from the water level to one of the L-shaped brackets that attaches to the liner at or near the leak detector riser.

NOTE: If the freeboard is approximately 30.5 cm (12 in.) or less, then decanting from one unit into another unit may be necessary. The freeboard must remain greater than 24.4 cm (9.6 in.).

4.2.3 Maintenance and Removal of Sediments

Sediments accumulated in the Modular Storage Units are potentially contaminated and controls such as water, fixatives, or covers will be applied, if needed, as determined by health physics personnel. Beneficial use of other appropriate water (e.g. Plutonium Finishing Plant Water Wall water) may be used for the same purpose with concurrence from the lead regulatory agency.

Sediments may be removed by appropriate means and disposed of in accordance with Section 6.2.

4.2.4 Measuring Water Level in Leak Detection Risers

An electronic tape meter will be used to measure the water level in the leak detection riser. When the electronic tape probe is submersed in water; this completes a circuit that activates the buzzer and light on the electronic tape meter. To operate the meter, the electronic tape probe is lowered so the tip touches the bottom of the leak detection system standpipe. This allows for the observation of the distance on the electronic tape measurement at the lower edge of the tape guide.

The electronic tape probe is then raised in the leak detection riser until the tone from the electronic tape meter stops, indicating that the electronic tape probe is no longer in contact with the water, and again, allow for the observation of the distance on the electronic tape measurement at the lower edge of the tape guide.

Finally, determine the difference between the two measurements, and record the value to the nearest tenth (0.10) of a ft (3 cm) as the leak detection riser water depth. If no tone is heard, water level should be recorded as zero. Due to the tip design, any water level less than 7.6 cm (3 in.) will not be detected.

NOTE: Water may slowly accumulate in the leak detection riser due to condensation between liners, diffusion through the High Density Polyethylene (HDPE) liner, or potentially, from leaks at the sides where the fabric sandwich is attached to the frame. Water accumulation rates of up to 3.8 L (1 gal) per day are anticipated.

If a leak is found in the primary liner and/or repairs are required, a pump will be available to transfer purgewater contents from one Modular Storage Unit to another. Piping and hoses will be capable of extending from one Modular Storage Unit to any one of the other units.

4.2.5 Tank Truck Transfers

Purgewater is transferred, by gravity through a drain hose, from the tanker truck to the Modular Storage Units. A splash pan will be used to support purgewater discharges into each Modular Storage Unit. After transfer of purgewater, tanker trucks are either directly returned to be used in support of well activities or they are parked in established areas. Tanker trucks that are not directly returned to be used in support of well activities and that contain quantities of dangerous or mixed waste that exceed those identified in WAC 173-303-160 will be parked in established areas that provide containment capable of collecting and holding spills and leaks. Containment will be provided for such tanker trucks with sufficient capacity to collect and hold all liquid remaining within the tank. A plat showing the location of the purgewater truck parking area is attached.

4.2.6 Inter-unit Transfers

Inter-unit transfers between Modular Storage Units may be performed if leaks are detected in the primary liner, or if imminent failure of a unit is detected. An inter-unit transfer will be performed by connecting piping to a system that transfers the contents from the leaking unit to another one unit, as necessary. Inter-unit transfers may also occur for the purpose of removing contaminant residuals from purgewater (e.g. by filter skid).

4.2.7 Removal of Excess Purgewater

During certain periods (e.g., particularly wet seasons, or increased well drilling activity), purgewater levels within the Modular Storage Units may rise faster than the normal rate of evaporation. In these instances, in order to maintain the required freeboard of greater than 24.4 cm (9.6 inches), purgewater may need to be decanted and ~~shipped~~ transported to the Effluent Treatment Facility, 200 West Pump and Treat, or other approved treatment facility.

Chemicals (e.g. sodium hypochlorite, copper sulfate, sodium hydroxide) may be applied to the water in the Modular Storage Units for beneficial purposes (e.g. control of biological growth and precipitation of suspended minerals).

5 Safety and Health Management and Controls

All emergency planning and preparedness activities for this project will be consistent with planning and preparedness actions taken by other Hanford Site contractors and similar projects. Activities will be in a manner that ensures the health and safety of workers and the public and the protection of the environment in the event of an abnormal incident during removal action activities.

5.1 Emergency Management

The contractor's Emergency Management Program (including preparedness, planning, and response) contains the administrative responsibilities for compliance with DOE/RL-94-02, *Hanford Emergency Response Plan*, and all applicable DOE Orders. The Emergency Management Program establishes a coordinated emergency response organization capable of planning for, responding to, and recovering from industrial, security, and hazardous material incidents. Emergency action plans for contractor-managed hazardous facilities identify the capabilities necessary to respond to emergency conditions, provide guidance and instruction for initiating emergency response actions, and serve as a basis for training personnel in emergency actions for each facility.

on classification under one or more of the following categories: radioactive, mixed, dangerous, nonradioactive, and/or nondangerous. Wastes may be conservatively managed as suspect radioactive, suspect dangerous, and suspect mixed. The anticipated waste streams include the following different types:

- Miscellaneous waste (e.g., rubber, soil, sediment, glass, paper, personal protective equipment, cloth, plastic, metal)
- Equipment and construction materials (e.g., secondary containment pads, purgewater truck parts, sampling equipment)
- Waste water from decontamination and instrument calibration activities (e.g., sampling equipment and cleaning of purgewater truck tanks) as well as altered screening samples from Pump-and-Treat facilities and field screening activities.
- Expired sampling products and rinsate from the addition of preservatives to sample containers (sample container preparation).
- Spent filter resin from removal of purgewater contaminant residuals at the Modular Storage Units.

6.2.2 Waste Characterization, Designation, and Disposal

Groundwater analytical data are maintained in the Hanford Environmental Information System (HEIS) database. This site-wide database contains the historical and current listing of the sample analytical results for all Hanford Site wells. The HEIS database is updated continually as sampling data are generated. A query of HEIS data will be conducted annually to identify any well samples that have exceeded the threshold for classification as characteristic waste. If a sample from a source that is not profiled as a characteristic waste exceeds the threshold, additional shipments of that waste to the Modular Storage Units will cease if necessary, until waste acceptance documentation is modified to accommodate the new classification.

Other waste that has contacted or become contaminated by waste managed under this removal action may be disposed at the Environmental Restoration Disposal Facility (ERDF) if such waste meets the ERDF acceptance criteria and is characterized using an EPA-approved sampling and analysis plan. Waste will be designated using process knowledge, historical analytical data, engineering calculations, and/or analyses of samples identified in the sampling and analysis plan, as appropriate.

The ERDF is the preferred disposal location, provided that the waste acceptance criteria are met. Waste will be staged within the onsite *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Area (Figure 2), or at the ERDF.

Offsite facilities that receive contaminated waste must be deemed acceptable by the EPA in accordance with 40 CFR 300.440, “Procedures for Planning and Implementing Off-Site Response Actions.” Used oil will be sent offsite for recycling or disposal. Spent or unusable chemicals/reagents may also be generated during field sampling and analysis and would require disposal at the appropriate facility based on the designation.

6.2.3 Decontamination

Decontamination of equipment, waste containers, etc. to support excavation activities will generally be performed using dry methods (such as wiping) to the extent possible. When wet methods (i.e., pressure washers) are used to achieve decontamination objectives, the associated water or cleaning solutions will

low-levels of residual radioactivity. Property released via this process will be viewed as containing no or de minimis levels of CERCLA hazardous substances, and therefore will not be subject to CERCLA.

6.5 Cultural, Historical, and Ecological Resource Protection Standards

Cultural and ecological resource reviews will be performed before starting the construction and operation activities to identify any potential impacts. Impacts on ecological resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-96-32, *Hanford Site Biological Resources Management Plan*, and DOE/RL-96-88, *Hanford Site Biological Resources Mitigation Strategy*, and with the applicable standards of all relevant biological species protection regulations.

This site has already been disturbed; however, implementation of DOE/RL-98-10, *Hanford Cultural Resources Management Plan*, and consultation with area Tribes will help ensure appropriate mitigation to avoid or minimize any adverse cultural or historical resource effects and address any relevant concerns.

Impacts to other cultural values including the viewshed from nearby traditional cultural properties will be minimized through implementation of DOE/RL-98-10; DOE/RL-2005-27, *Revised Mitigation Action Plan for the Environmental Restoration Disposal Facility*; and consultation with area Tribes as needed. This will help ensure appropriate mitigation to avoid or minimize any adverse effects to natural and cultural resources and address any other relevant concerns.

Potential impacts to cultural and historical resources that may be encountered during the short-term construction activities associated with implementing the removal action will be mitigated through compliance with the appropriate substantive requirements of the *National Historic Preservation Act of 1966* and other ARARs related to cultural preservation.

7 Project Administration

7.1 Project Schedule and Cost Estimate

Construction of the Modular Storage Units began in July 2009. In the fourth year of use of the Modular Storage Units, the Tri-Parties will evaluate the continued usage of the Modular Storage Units and determine if improved methods for purgewater management should be employed for longer term. If the Modular Storage Units will be used after five years or if there is evidence of leakage from the Modular Storage Units to the environment, RL will implement groundwater monitoring. The installation of the four monitoring wells is currently included as part of the 200-BP-5 Groundwater Operable Unit baseline occurring after October 2014.

Summarized cost estimates are shown in Table 1, which includes a projection of costs over the operation period (approximately 5 years). Total cost in today's dollars is approximately $10,995,000. An estimated additional cost for the installation of a groundwater monitoring well system is included at the end of Table 1 for information. If the Modular Storage Units are in use for more than 5 years, or if there is evidence of leakage, then a groundwater monitoring system will be installed. A transfer pipeline was installed in fiscal year 2019 for the transportation of modular storage unit water to the 200 West Pump and Treat facility at a cost of about $400,000. SGW-61673, *Treatment of Modutank Water at 200 West Pump & Treat*, estimated O&M over a 5-year period for transporting modular storage unit water at a cost of $852,840. The cost for transfer pipeline installation and operation is in addition to the costs in Table 1.

Groundwater monitoring was implemented at the modular storage units by DOE/RL-2013-44, The Modular Storage Units Groundwater Monitoring Plan. The initial test well was drilled in calendar year 2014 and geologic information was evaluated. No water was encountered from an unconfined aquifer. It was determined that no further wells need to be drilled or monitoring performed for the modular storage units. Evaluation results will be included in project files.

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