Document Name		**Soil Characterization, Sampling and Analysis Plan, Waiahole Reservoir System, Reservoirs 155 and 225, Kunia, Oahu, Hawaii. March 2022**		
Requestor:		HDOH HEER Office		
Review Completion Date:		March 7, 2022	**Reviewer(s):** Sven Lindstrom, Voluntary Cleanup Program Specialist	**E2 Response:** Angie Peltier, Geologist and Arlene Campbell, Senior Geologist
Comment Number	**Section Page (P) / Line (L)**	**Issue**		**Response**
1	1.2	a) Please clarify that the soil requiring characterization has already been excavated from the new reservoirs A and B and is stockpiled in the areas labeled in pink on Figure 1-2. b) Please explain that HDOH agreed to accept surface soil sampling results from the adjacent fields R-B-1 through R-B-3 and R-A-1 through R-A-3 as representative of a "Worst case scenario" of the actual concentrations of residual pesticide in the stockpiles based on similar historical land use and the application of pesticides to the surface being expected to result in the highest residual concentrations in the surface soils. Therefore, if the concentrations of the contaminants of potential concern (COPCs) do not exceed HDOH Tier 1 environmental action levels (EALs) in the adjacent fields, then we can assume that the concentrations in the stockpiles also do not exceed the EALs.		a) Section 1.2, 1st sentence was revised and reads as follows: *Element Environmental, LLC (E2) has prepared this Sampling and Analysis Plan (SAP) to describe environmental testing of soils for the ongoing HDOA Waiahole Reservoirs project, which includes rebuilding reservoir embankments for two existing reservoirs (Reservoirs 155 and 225 shown on Figure 1-1) using soil previously excavated and stockpiled adjacent to New Reservoirs A and B, highlighted in pink on Figure 1-2.* b) Section 1.2, 2nd Paragraph was added: *The Hawaii Department of Health (HDOH) Hazard Evaluation and Emergency Response (HEER) Office agreed to accept surface soil sampling results from adjacent fields R-A-1 through R-A-3 and R-B-1 through R-B-3 as representative of a "worst case scenario" of the actual concentrations of residual pesticides in the stockpiles based on 1) similar historical land use and 2) the application of pesticides to the surface being expected to result in the highest residual concentrations in the surface soils. Therefore, if the concentrations of the contaminants of potential concern (COPCs) do not exceed HDOH Tier 1 environmental action levels (EALs) in the adjacent fields, then it can be assumed that the concentrations in the stockpiles also do not exceed the EALs.*
2		Please explain what "Option B" is and provide a plan if one has been prepared. If not, then please clarify that a plan for Option B will need to be prepared in the event that it is needed and that the plan must be submitted to the HEER Office for review and approval prior to sampling. Please note that HDOH recommends submitting plans for review 60 to 90 days prior to conducting the activity to allow sufficient time for review and revisions.		Option B may include using heavy equipment to shape the stockpiles so that a drill rig can access the top of the piles. Soil borings will be installed to collect *MULTI INCREMENT* samples. Preparation of a SAP for this option is not included in our current contract. We are all hoping that the samples do not exceed EALs.

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3		There is a lot of discussion about a National Priorities List (NPL) site associated with the Kunia Well which has impacted groundwater in the vicinity of the four reservoir sites covered by this SAP. Please clarify whether the four project sites are within the boundary of the NPL site and whether contaminants associated with the NPL release are likely to have impacted the sites. If so, then please explain whether COPCs associated with the NPL release should be included in the SAP. If not, then please clearly state that the NPL release did not impact the project sites. To illustrate the potential impact to the sites from the NPL release, please include the location of the Kunia Well and impacted areas in the Figure(s) where appropriate.		Information was added to the report. None of the reservoirs are within the boundaries of the Superfund Site. The wells and location of the Superfund site were added to the figures for clarity.
4		Please clarify what activities will be conducted in the Contractor's Operations and Staging Areas (COSAs) and what potential release mechanisms are anticipated (e.g., potential releases of fuel and oil from vehicles and heavy equipment, potential leaching from soil stockpiles, etc.). Will there be temporary soil stockpile areas in the COSAs? If so, it would be helpful to depict the locations of the various COSA activities on the Figure(s), e.g., soil stockpile areas, equipment laydown areas, vehicle, and heavy equipment parking areas, etc. Knowing where these areas will be can help determine how to select separate decision units (DUs) to sample (see next comment).		The purpose of sampling the COSA (only one is being sampled) is to establish a baseline soil condition for the property owner before the site is used by the Contractor (to be determined) as a staging area. Since the contract for this portion of the project has not been issued, we can only state that the "clean" stockpiled soil will be hauled to the COSAs and temporarily stockpiled until the embankment construction is complete. The Contractor will be responsible for characterizing the soil within the COSA to verify that the soil condition has not been negatively impacted by use as a staging area.

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5		Unless the Hawaii Department of Agriculture (HDOA) plans to excavate and re-use soil from the COSA sites, or if a reportable release occurs, the HEER Office does not have any requirements as to how pre- and post-activity confirmation sampling in those areas is conducted. However, if the intention is for HDOA to collect sufficient defensible data to document existing pre-activity (baseline) contamination in those areas as compared to post-activity conditions, then HDOH recommend collecting samples in both COSAs from DUs no larger than 1 acre. Preferably, DUs should be selected by proposed use, e.g., stockpile areas, vehicle areas, laydown areas, etc. If soil will be re-used off-site where land-use is unrestricted, or if a release occurs during construction, DU sizes of no more than 5,000 square feet may be required.		Acknowledged.
6		Figure 1-4 was not included in the draft SAP submitted. Please provide a copy for review.		This figure has been included.
7		When using a hand trowel for soil sample collection it may be difficult and time consuming to ensure that the increments collected includes an equal amount of soil from the entire targeted depth, in this case 0 to 6-inches below ground surface (bgs). Therefore, HDOH recommends instead using a sample coring device or cordless hammer drill to collect soil samples rather than a trowel. See the HEER Office Technical Guidance Manual (TGM) Section 5.3 for a description of these tools. If a trowel will be used, please ensure that it is a "flat bottom scoop" as depicted in Figure 5-10 of the TGM. Additionally, HDOH recommends collecting 75 to 100 increments across the 1-acre DUs, rather than 50. This is not required but will help ensure relative standard deviation (RSD) does not exceed 35% which could require remobilization and re-sampling.		Changed use of a trowel to using a sample coring device. The number of increments to evaluate the 1-acre DUs was increased to 100.

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8	Section 2.2	This section describes general site conditions for Reservoirs 155 and 225. However, the objective of this SAP is to investigate soil conditions at the new reservoirs A and B. In particular, it is important to document that the general site conditions and historical use of the reservoirs (the sources of the soil stockpiles) is similar to the conditions and historic use of the adjacent fields which will be sampled, and which are presumed to be representative of the soil in the stockpiles (e.g., no pesticide mixing areas present in any of the areas). Therefore, please revise this section or include an additional section that describes those areas that will be sampled and confirms that they likely have similar historic pesticide use as the sources of the stockpiles (i.e., the new reservoirs). This section is relevant to the COSAs, particularly if they may have been impacted by the historic NPL release or other potential contaminants sources described in it (e.g., the railroad, pineapple cultivation, etc.) and should be used to select COPCs for those areas.		General site conditions for Reservoirs A and B were added to the document.
9	Section 2.5	a. ,first paragraph: Were the new reservoir locations used for both sugar and pineapple cultivation, or is the historic use unknown? Please revise, as necessary. b. Second paragraph: Please include an explanation for the selection of COCPs for the COSAs. Are these contaminants suspected to be present from historic activities, or are they potential contaminants that could be released as a result of the proposed construction activity? What is the potential source of PCBs? Do contaminants associated with the NPL release need to be included?		a) Historic information for Reservoirs A and B were added. b) The stockpiled soil was generated from land historically used for sugar and pineapple cultivation and the historical use of the COSA is similar. Both sugar/pineapple cultivation and assumed staging area activities include the use of heavy equipment, we selected the COPCs based on potential releases of used oil, diesel, and gasoline-related petroleum constituents and heavy metals. OCPs were included because of the historic use of these pesticides for sugar/pineapple.

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10	Section 3.1	a. Second paragraph states: "HDOA requires that surface soil slated for reuse for embankment repairs…be characterized insitu in the vicinity of Reservoirs A and B to determine its suitability for reuse." This is confusing, it appears to state that the surface soil being sampled is the soil that will be used for embankment repairs. However, the surface soil being sampled is intended to be representative of the stockpile soil conditions but is the stockpiles soil from the new reservoirs that will be used for the embankment repairs. Please revise to clarify this distinction. (See Comment #1). b. Third paragraph: What is the plan for post-construction confirmation sampling? Will it only include sampling the same 2-acre DU of one of the COSAs? Will there be a separate plan prepared for post-construction confirmation sampling? Will confirmation sampling be dependent upon whether a release is observed or suspected? Please include some of these details. Also see Comment #5.		*a) 2nd Paragraph Revised as follows:* *Stockpiled soil excavated during the construction of Reservoirs A and B must be characterized in accordance with HDOH stockpiled soil guidance and found suitable prior to reuse for embankment repairs at Reservoirs 155 and 225.* *b) Post-construction verification sampling of the Reservoir 255 is required by the landowner and is the responsibility of the Construction Contractor (yet to be identified). We added the following statement to the SAP in Section 3.1 "The land owner for the Reservoir 255 COSA requires characterization of the surface soil to establish the baseline condition of the soil: post-construction characterization will be completed using the methodology outlined in this SAP and on behalf of the land owner, the Contractor's consultant will compare baseline soil sample results to post-construction sample results to evaluate negative impacts to the Reservoir 225 COSA by construction activities (if any)."* *E2 is contracted to collect one MULTI INCREMENT surface soil from the Reservoir 255 COSA. Additional information was added to the Decision Statement in Section 3.5 for options if the EALs are exceeded.*

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11	Section 3.2	Items 2 and 3 appear to be outside the scope of this SAP. Item #2 involves conducting an Environmental Hazard Evaluation (EHE) and Item #3 appears to describe a Remedial Alternatives Analysis (RAA). These are generally separate steps of a response action from the Site Characterization step. Does Element Environmental intend to prepare an EHE and RAA as part of the final report associated with this SAP? If so, then please include that information in the Introduction and other relevant sections. Based on other descriptions in this SAP, it appears that Step 2 of the "primary objective" should be something like: "If COCP concentrations exceed screening levels, evaluate whether direct sampling of the stockpiles from the new reservoirs ("Option B") is necessary and prepare a stockpile sampling plan. If COPC concentrations do not exceed Tier 1 EALs, then stockpiled soil may be used for the embankment project without further assessment." Step 2 of the "secondary objective" may want to consider whether identifying COPCs should trigger additional focused sampling (i.e., smaller DUs and sampling of the other COSA).	Acknowledged. Option B is not technically an option and E2 has not been contracted to make any representations regarding Option B. Items 2 and 3 were removed as primary objectives from the SAP. Item 2 now reads: *2. If COPCs are identified in soil at concentrations exceeding screening levels for embankment repair reuse, other options will be evaluated.* Acknowledged. Items 2 and 3 were removed as secondary objectives from the SAP. Item 2 now reads: *2. If COPCs are identified in soil within the COSA at concentrations exceeding screening levels for embankment repair reuse, other options will be evaluated*.

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12	Section 3.3.1 fourth and fifth bullets	Please revise the descriptions in parentheses for clarification, there are no "stockpiled soil" samples, and samples from all areas are "surface soil samples." Suggest describing samples collected from areas adjacent the new reservoirs as "new reservoir areas" to distinguish them from COSAs.		*Section 3.3.1 revised and now reads:* *Surface soil samples from the DUs adjacent to the new reservoirs (Reservoirs A and B) will be analyzed for one or more of the following COPCs using EPA SW-846 methods by an accredited analytical laboratory:* • *OCPs, including technical chlordane, using EPA Method 8081 and* • *Total and bioaccessible arsenic.* *Surface soil samples from the from the Reservoir 255 COSA will be analyzed for one or more of the following COPCs using EPA SW-846 methods by an accredited analytical laboratory:* • *Total petroleum hydrocarbons (TPH) as diesel range organics (DRO) and TPH as residual range organics (RRO) using EPA Method 8015;* • *18 Priority Pollutant PAHs using EPA Method 8270-SIM;* • *PCBs using EPA Method 8082 (aroclors only);* • *OCPs, including technical chlordane, using EPA Method 8081;* • *RCRA 8 metals using EPA Methods 6020/7470; and* • *Total and bioaccessible arsenic.*
13	Section 4.1.1	a. The use of a sectorial splitter to prepare laboratory subsamples is actually preferred to collecting sub-increments with a spatula. If the laboratory has a sectorial splitter, please use this method for all samples during the initial sample preparation, rather than only in the event of a chlordane exceedance. This will also save on the analytical costs of re-analyzing samples and save time. b. In the last paragraph, please change "…then sampling outlined in Option B -Stockpile Sampling will be required" to state that then a SAP for sampling of the stockpile will be prepared (see Comment #2).		a. Acknowledged. The sectorial splitter will be used for all of the initial samples to be analyzed for OCPs. Section 4.1.1 was revised and now reads: *Laboratory processing and subsampling will be completed in accordance with HDOH recommendations. Laboratory processing and subsampling for OCPs will be completed using a sectorial splitter to minimize the "clumping" effect of some OCPs (i.e., technical chlordane).* b. Last paragraph changed to read: *If all COPCs are below HDOH Tier 1 EALs, then HDOH will allow use of the stockpiled soil for embankments at the reservoir sites, as proposed. If one or more of the EALs is exceeded, then other alternatives will be considered.*

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14	Section 4.1.4	Please consider using alternative sampling method to the stainless-steel trowel (see Comment #7). If using the trowel, please describe how sample increments will be collected to ensure even distribution across the entire targeted sample depth (see TGM Section 5.3.3).		E2 will use manual sample corers rather than trowels.
15	Section 5	Please include a description of how the analytical results of primary and replicate samples will be used to determine the % RSD and how that will be used to evaluate sampling precision. See TGM Section 4.2.8.2.		Added as suggested to Section 5.6.1.
16	Section 5.6.1.3	The last sentence is unclear and refers back to the same section (section 5), which does not seem to be correct. Please revise.		Representativeness will be achieved by conducting sampling in compliance with the sample collection procedures described in the Section 4.1.4.1.