

Ross Island Fill Evaluation

The purpose of this fact sheet is to provide basic guidance on how to collect and analyze samples needed to characterize material proposed for use as reclamation fill at Ross Island. Fill is to be placed either upland or in-water at Ross Island according to the Fill Evaluation Scope of Work (SOW), attached to Division of State Lands (DSL) Permit *RF-*. As described in the scope of work, in-water criteria apply to all fill placed in Ross Island Lagoon below or within 50 feet of the seasonal high water line.

In-Water Fill

In general, procedures for characterizing potential in-water fill should follow procedures described in the U.S. Army Corps of Engineers (the Corps) document *Dredged Material Evaluation Framework (DMEF)* (1998). However, the protocols summarized below occasionally vary from the Corps requirements and screening levels reflect site-specific considerations so that information is sufficient to assess the suitability of material proposed for placement in the unique environment of Ross Island Lagoon. Where required by individual dredging permits, a project Sampling and Analysis Plan (SAP) will be developed for review and approval by the Corps. DEQ review may also be required, as outlined in the scope of work. The sampling plan must meet both the Corps dredge permitting requirements and any additional requirements for material placement in Ross Island lagoon.

Testing requirements

The number of samples to be collected and analyzed depends on the nature of the material and the potential contaminant sources in the area from which it will be dredged.

Samples must be representative of the sediment proposed for placement at Ross Island. This sediment should be divided into "homogenous units", based on prior knowledge of activities that have occurred in the area where the material will be obtained and the nature (e.g., particle size, total organic carbon) of that material. Collect a minimum of five samples from each homogenous unit and analyze for contaminants that may be present due to current or historical onsite or upstream activities. Samples must also be analyzed for naturally occurring metals that may be present in the dredge area at concentrations that would be considered elevated in Ross Island Lagoon.

Samples may be obtained from the in-place material prior to dredging, or from the barge after dredging. However, the number of samples and the requirement that they be representative does not change. If obtained after dredging, make sure that the material can be held long enough for laboratory results to be reported, and sampling documentation and lab results to be reviewed, prior to placement in the Lagoon. It is always prudent to identify alternative disposal locations if sampling results indicate that placement at Ross Island is not appropriate.

Samples must be analyzed for physical and chemical parameters as outlined in the Dredge Material Evaluation Framework. If chemistry results exceed sediment toxicity or bioaccumulation screening level values¹ provided in Table 1, they are not acceptable for disposal in water as "inert material" unless they subsequently pass toxicity bioassay and/or bioaccumulation tests as outlined in the evaluation framework. If compounds are detected for which screening levels are not provided in Table 1, it will be necessary to consult with DEQ regarding protective levels and the need for additional testing. DEQ plans to update Table 1 as new information becomes available. These updates may include adding compounds that have been detected in fill proposals or changing screening levels as new toxicity/bioaccumulation data become available. If more than 10 carcinogens or 2 non-carcinogens are detected it may be necessary to account for combined effects. Please consult with DEQ in these cases.

If toxicity testing is required, sufficient sample volume must have been collected during the original sampling event for such testing. Collect a sufficient volume of material from each sampling location and reference areas to run chemistry and bioassay analyses. A minimum of three bioassay analyses for the proposed fill material will be required. Properly store material collected for biological testing at the laboratory until chemical analyses can be completed. Biological testing should be initiated within 56 days of collecting sediment samples.



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Last Update
4/15/03
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¹ Note that the detection limits for potential contaminants must be at or below the sediment screening levels provided in this guidance. The laboratory should be made aware of the required sensitivity prior to conducting the analyses.

If bioaccumulation testing is required, sufficient sample volume must have been collected during the original sampling for this test or a new sample will need to be collected and run for sediment chemistry as well as bioaccumulation evaluation. A minimum of one bioaccumulation analysis will be required before material can be considered for disposal in the Lagoon. Results of the bioaccumulation test will be compared to the Acceptable Tissue Levels provided in Table 1.

Sediment sampling and handling

Clearly mark sampling locations on a site map with sufficient accuracy to allow resampling in the same location if required. Preferably, sampling locations will be identified with a differential global positioning system (DGPS). Other methods such as, triangulation siting or tape measurements with compass directions, may be acceptable.

Choice of sample collection methods depends on the depth of planned dredging, heterogeneity (degree of dissimilar physical characteristics throughout the material) of in-place sediment, volume of sample needed, cost, and ease of collection.

Grab samples are adequate for areas where dredging will not exceed two feet in depth or for post-dredge material; core samples are more appropriate where dredging will exceed two feet.

Use standard sediment sampling equipment, usually constructed of stainless steel. Sampling procedures and protocols vary depending on methodology used.

Properly decontaminate all sampling equipment before obtaining each sample, and take care to prevent incidental contact of the sample with potentially contaminated materials (including boat engine exhaust).

Use pre-cleaned, tight sealing, and properly labeled sample containers. Fill out a chain-of-custody tracking form for all samples collected for analysis. Labs will often provide the necessary containers, chain of custody forms, and a cooler for cold transport of the samples back to the lab. Place all samples on ice as soon as collected, and make sure that the ice does not melt prior to delivery to the lab. Do not use dry ice, as freezing can adversely affect sediment chemistry.

Sample analysis

Samples should be analyzed for chemicals that are likely to be associated with past and current site activities and/or with upstream sediment

potentially deposited in the dredge area. Ross Island Sand and Gravel Co. (RISG) has prepared a fact sheet (Fact Sheet #2) that provides a list of typical chemical tests and their associated lab fees.

All chemical analyses should be conducted by an experienced analytical laboratory using accepted methods and recommended reporting limits. RISG has prepared a fact sheet (Fact Sheet #3) that provides a list of local laboratories that can perform these tests.

Appropriate Quality Assurance/Quality Control (QA/QC) samples should be analyzed. See RISG Fact Sheet #1 for further details on sample QA/QC.

Upland Fill

In general, sampling should follow standard protocols described in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (EPA SW-846). This document can be found on-line at <http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>.

Testing requirements

Testing requirements for upland fill are essentially the same as those described above for in-water fill. Note that samples should be analyzed for naturally occurring metals that may be present at levels that would be considered elevated at Ross Island.

If chemistry results exceed the screening level values provided in Table 2, they may not be acceptable for disposal as “inert” material at Ross Island. If direct contact screening levels are not exceeded but a screening level based on a migration to groundwater is exceeded, leachate tests (TCLP or SPLP) may be performed to more accurately evaluate this pathway. Note that wet material; e.g., dredged sediments, must be dewatered prior to performing the leachate tests.

Soil sampling and handling

Soil sampling procedures are essentially the same as those described above for in-water fill; with the exception that wet samples must be dewatered and exposed to the atmosphere to allow for oxidation prior to analysis. Free liquids must be reduced by natural drying processes to the point that the material could pass the paint filter test.

Sample analysis

Samples should be analyzed for chemicals that are likely to be associated with past and current site activities and naturally occurring metals that

may be elevated relative to conditions at Ross Island. RISG fact sheets #2 and #3 provide information on typical chemical tests and quality assurance/quality controls procedures for sample analysis.

All chemical analyses should be conducted by an experienced analytical laboratory using accepted methods and recommended reporting limits. A listing of laboratories accredited through the Oregon Environmental Accreditation Program for solid waste (Resource Conservation and Recovery Act – RCRA) analyses can be found at <http://www.deq.state.or.us/lab/orelap/orelap.htm>.

Contacts

Direct questions on sampling requirements to Ross Island or DEQ. The current point of contact at Ross Island is Jim Rue, (503) 239-5504. The current points of contact at DEQ are Jennifer Sutter, (503) 229-6148, for in-water disposal questions and Mark Reeves, (503) 229-5157, for upland disposal questions.

For more information

This fact sheet and additional information about the Ross Island investigation can be found on DEQ's website at:
www.deq.state.or.us/nwr/rossisland.htm.