



TO: Piper Peterson Lee, U.S. Environmental Protection Agency

FROM: Mary Henley, P.E., Project Manager, City of Tacoma

SUBJECT: Identification of Wells to be Monitored to Establish Baseline at CDF

DATE: November 21, 2006

This memorandum presents a proposal to the United States Environmental Protection Agency (EPA) for wells to be monitored for establishment of baseline groundwater quality at the St. Paul Waterway Confined Disposal Facility (CDF). Investigation of the hydrogeologic conditions and monitoring to establish baseline groundwater quality is being performed as part of the EPA-approved Operations, Maintenance, and Monitoring Plan (OMMP) for the Thea Foss and Wheeler-Osgood Waterways Remediation Project (City of Tacoma 2006).

Baseline groundwater quality monitoring at the CDF includes quarterly groundwater sampling and analysis over a two-year period. As specified in the OMMP, the wells to be included in baseline groundwater monitoring are to be selected based on the post-construction hydrogeologic conditions at the CDF. Selection of wells for use in baseline groundwater monitoring at the CDF is the second step required by the OMMP for this aspect of the project. The initial step was to complete a post-construction hydrogeological investigation of the CDF. Results of the hydrogeological investigation are presented in the Post-Construction Hydrogeological Conditions Report. The findings and conclusions from the hydrogeological investigation are summarized in the following section and provide the basis for the proposed monitoring well network to be used to establish baseline groundwater quality at the CDF.

Summary of CDF Hydrological Conditions

The following hydrogeological conditions and potential contaminant transport mechanisms are identified in the Post-Construction Hydrogeological Conditions Report:

- Shallow groundwater, downgradient of the dredged sediment recently placed in the CDF is most likely to be impacted by saltwater washout effects and to transport contaminants from the CDF. Modeling performed as part of the design, identified that contaminant release is most likely to occur where less-saline groundwater and stormwater infiltration come in contact with confined, contaminated dredged materials and then flows away from (i.e., downgradient from) the CDF. Hydrogeological investigations indicate that shallow groundwater generally flows to the west toward the outer St. Paul and Middle Waterways.

- Intermediate depth groundwater, downgradient of the CDF, also has the potential to transport contamination from the confined, contaminated dredged materials. Evaluation of vertical groundwater gradients shows that shallow and deep groundwater flowing through the CDF converge at the intermediate depth horizon. Therefore, groundwater from all depths that has been in contact with the contaminated dredged material has the potential to flow from the CDF within the intermediate depth horizon. Hydrogeological investigations indicate that intermediate depth groundwater flows to the west toward the Middle Waterway.

Recommended Wells for Baseline Groundwater Quality Monitoring

Based on the findings of the CDF hydrogeological conditions investigation, the following monitoring wells are recommended for sampling to establish baseline groundwater quality at the CDF:

- Shallow depth monitoring wells MW-01, MW-02, MW-06, and MW-10 located downgradient of dredged sediment placed in the CDF (Figure 1). These wells are recommended to identify contaminant levels that may result from salt washout by shallow groundwater that encounters the dredged material confined within the CDF and is then discharged downgradient.
- Intermediate depth monitoring wells MW-07 and MW-11 also located downgradient of dredged sediment placed in the CDF. These wells are recommended to identify contaminant levels that may result from shallow, intermediate, and deep groundwater that encounters the dredged material within the CDF and converges at the intermediate depth as it discharges downgradient.
- Monitoring Wells MW-04 and MW-05, installed within the CDF. These wells are recommended to identify contaminant levels in groundwater while it is within the dredged material confined in the CDF.

On approval of the well network by EPA, baseline quarterly groundwater monitoring activities will be initiated in accordance with the OMMP. EPA approval is desired before January 2007, to allow performance of the initial quarter of baseline monitoring during the winter wet season. Constituents to be analyzed during this two year baseline monitoring effort, along with sampling and analysis procedures are outlined in the OMMP.

If you have any questions concerning the monitoring wells selected for baseline groundwater quality monitoring please give me a call at 253-502-2113.

Attachment – Figure 1 Baseline Groundwater Monitoring Locations



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**Thea Foss and Wheeler-Osgood Waterways
Baseline Groundwater Monitoring**

**Figure 1
Baseline Groundwater Monitoring Locations**