



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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November 27, 2000

Memorandum

TO: Ann Kenny, NWRO Shorelands and Environmental Assessment Program  
Kevin Fitzpatrick, NWRO Water Quality Program

FROM: Dave Garland, NWRO Water Quality *Dave G.*

SUBJECT: Sea-Tac Third Runway Borrow Area 3 Wetland Impacts  
Recommendations for Wetland Preservation

BACKGROUND:

This memo constitutes my final review comments on potential wetland impacts from the Port of Seattle proposal to excavate sand and gravel fill material from a borrow pit located just south of Sea-Tac Airport. The borrow pit, known as Borrow Area 3, is proposed to be excavated to provide some of the material needed for the proposed Sea-Tac Third Runway fill embankment. Concern for hydrologic impacts from mining in Borrow Area 3 began when independent hydrologic studies conducted for Ecology by Pacific Groundwater Group (PGG, 2000) concluded that the proposed excavation "would likely have substantial impacts to wetland water flows, and possibly biota." (pg. 74) There are three wetlands located in Borrow Area 3 that are over one-half acre in area, and four smaller wetlands less than 0.1 acre. The proposed excavation in Area 3 is designed to narrowly avoid these seven wetlands and excavate sand and gravel to depths slightly lower (10 – 20 feet) than the elevations of the wetlands. Groundwater flow direction near Borrow Area 3 was uncertain at the time of the PGG report, but now has been determined to be generally from the northwest. Recharge to the wetlands is believed to be partially dependent on water from a perched water-bearing zone. The excavation proposal is to remove the perched water-bearing zone and perching horizon on the north and east of the wetlands, but not to the west.

Since the Sea-Tac Runway Fill Hydrologic Studies Report (PGG, 2000) was published, the Port has proposed measures to ensure maintenance of wetland hydrology, and has proposed monitoring to verify effectiveness of the measures (Hart Crowser, 2000a, 2000b).

## **FINDINGS:**

The Port proposes to prevent potential adverse impacts to the hydrology of Borrow Area 3 wetlands by collecting groundwater seepage in a drainage swale along the western slope face of the excavation and diverting the collected water to wetland 29. The drainage swale would be constructed on a post-mining bench along the exposed seepage face of the perching layer in the pit. The drainage swale is proposed to be unlined, with a contingency that it be lined if flow is lost to underlying permeable sediments. The drainage swale would flow to a reinforced concrete flow control structure that directs recharge to wetland 29 while allowing excess overflow to be diverted to a nearby stormwater detention pond in the bottom of the pit.

On August 17, 2000, Paul Agid of the Port of Seattle, Michael Kenrick of Hart Crowser, Jim Kelley of Parametrix and I met at Port of Seattle offices and field inspected wetlands 29 and 30. We dug shallow soil pits (~2 feet deep) at both wetland locations to examine soil and moisture characteristics. We found fine sand and silty soils with high moisture and some organic content at both sites. While there was general agreement that the proposed excavation in Borrow Area 3 could potentially adversely affect wetland 29 and 30 hydrology by intercepting a perched aquifer zone, the proposed drainage swale is designed to collect seepage from an area larger than the perched aquifer zone contributing recharge to wetland 29. The drainage swale is therefore expected to make up for any losses to wetland hydrology caused by mining. The drainage swale may have to be lined in places in order to deliver water captured from the perched zone seepage to wetland 29.

## **CONCLUSION;**

Based on review of the above-mentioned documents and a field examination of the site, it is my opinion there is reasonable assurance that Borrow Area 3 wetland hydrology will not be adversely affected by the excavation proposal and wetland preservation measures described in the Port of Seattle consultant reports (Hart Crowser 2000a and 2000b). This opinion is qualified by the expectation that the excavation in Borrow Area 3 will adhere to the recommendations described in the following section.

## **RECOMMENDATIONS;**

The following recommendations are taken or altered from the Port of Seattle consultant reports regarding impacts to Borrow Area 3 wetlands (Hart Crowser 2000a and 2000b) and are considered critical to maintaining the hydrologic integrity of the wetlands.

- Borrow pit excavations shall leave a minimum 50-foot undisturbed buffer around each of the seven wetlands identified in Borrow Area 3.
- A drainage swale shall be constructed along the northwest margin of the proposed borrow pit as described in Port of Seattle consultant report by Hart Crowser (2000b), to divert seepage from the perching horizon to wetland 29.

- The drainage swale shall be lined (with HDPE or other similar liner material) where necessary to minimize infiltration of captured seepage water through the bottom of the swale (as described in Hart Crowser 2000b).
- A flow control structure shall be constructed in the course of the drainage swale before it enters wetland 29 to control excess flows to the wetland. The flow control weir shall be designed to provide a consistent low flow of recharge seepage into wetland 29, and enable diversion of excess flow in the drainage swale away from wetland 29 to a stormwater detention pond (as described in Hart Crowser 2000b, and as illustrated in Figure 9).
- The drainage swale shall be inspected and maintained at a minimum frequency of twice a year. Swale maintenance shall include adjustment of flow control weir boards to provide appropriate flows to wetland 29, and removal of vegetation or fill in the swale which may interfere with the seepage collection and diversion functions of the swale.

Thank you for the opportunity to review and comment on the potential wetland impacts in Borrow Area 3. I hope these comments assist with Ecology's Section 401 Water Quality Certification decision process. Please let me know if I can be of further assistance.

#### *References*

- Hart Crowser, Inc., 2000a. Evaluation of Perched Zone Interception and Possible Impacts to Wetland Hydrology, Borrow Area 3, Sea-Tac Airport Third Runway. Prepared for HNTB and the Port of Seattle, September 12, 2000, 13 pages plus tables and figures.
- Hart Crowser, Inc., 2000b. Sea-Tac Third Runway – Borrow Area 3; Preservation of Wetlands. Memo from Michael Kenrick and Michael Bailey (Hart Crowser) to Jim Thomson (HNTB) on wetland hydrology and proposed drainage swale design. Prepared for HNTB and the Port of Seattle, October 20, 2000, 10 pages plus figures.
- Pacific Groundwater Group, 2000. Sea-Tac Runway Fill Hydrologic Studies Report. Prepared for Washington State Department of Ecology, Northwest Regional Office, June 19, 2000. 79 pages plus tables, figures and appendices.