



SEA-TAC RUNWAY FILL

Hydrologic Studies

Project Startup Fact Sheet—December 1999—Volume 1, Number 1

Public Workshop Meeting

December 1, 1999
7 p.m. to 9 p.m.
Highline High School cafeteria
225 South 152nd Street
Burien, Washington

Because the Sea-Tac Runway Fill Hydrologic studies are multidisciplinary, they will be conducted by a team of consultants:

Pacific Groundwater Group

Groundwater and soil investigations, project management, and public involvement

Earth Tech

Surface water investigations

Ecology and Environment, Inc.

Wetlands and biota investigations, and public involvement

Glossary

Stormwater discharge is the water that runs off the land surface when it rains. Development tends to increase stormwater discharge because vegetation is removed and hard surfaces usually are added.

A **hydrologic model** is a set of equations or other relationships that describe the way surface water is generated from precipitation and moves at a specific site.

Mitigation is the practice of allowing unavoidable wetland loss in exchange for their replacement elsewhere through restoration, preservation, or creation of new wetlands.

This Fact Sheet is the first of three that the Washington State Department of Ecology (Ecology) will produce to inform the public about the Sea-Tac Runway Fill Hydrologic Studies. The studies will analyze some of the environmental impacts of proposed construction of a third runway at Sea-Tac Airport.

This Fact Sheet provides an overview of the project, a schedule of public workshops, and contact information. Ecology will conduct two public workshops. The first workshop is scheduled for 7 p.m. to 9 p.m. on December 1, 1999 at Highline High School cafeteria in Burien. The second public workshop will be conducted at the conclusion of the studies. Ecology also will produce two additional Fact Sheets. The Mid-Study Fact Sheet will report on the studies' interim findings and discuss future project objectives. At the end of these studies, Ecology will produce a Project Completion Fact Sheet, which will provide a summary of the findings and conclusions.

Please take advantage of glossaries included in this Fact Sheet, which define technical terms we use to describe our work. Words printed in italics in the text of the Fact Sheet are defined in the glossaries.

Background

The Port of Seattle has proposed to build a third runway after completing a major fill project to bring the elevation of property west of the airport complex to the same level as the existing runways. In response to citizen concerns about the project, the 1999 Washington State Legislature and Gov. Locke approved the Sea-Tac Runway Fill Hydrologic Studies. Ecology contracted the Pacific Groundwater Group (PGG) Team to consider impacts of the fill project on aquifers, wetlands, and Des Moines, Miller, and Walker Creeks. The PGG Team includes Earth Tech to assist with the surface water evaluation and Ecology and Environment, Inc., (E & E) to evaluate impacts to wetlands, and plant and animal life. The study area includes the fill area and all adjoining wetlands, streams, and aquifers potentially impacted by the proposed runway project. The Sea-Tac Runway Fill Hydrologic Studies will be completed by June 30, 2000.

Areas for Investigation

The Sea-Tac Runway Fill Hydrologic Studies include four main areas of investigation: surface water, groundwater, wetlands, plant and animal life, and contaminants in the fill material.

Surface Water

The project area is located within the Des Moines Creek, Miller Creek, and Walker Creek watersheds. To decrease runoff from existing and proposed airport facilities, the Port of Seattle has proposed stormwater flow control methods designed to match predevelopment *stormwater discharges*. The proposal is based upon *hydrologic models* of the affected watersheds. Earth Tech will evaluate whether the models accurately characterize the hydrology of these streams and the potential impacts to streamflows. Earth Tech also is reviewing how the Port's hydrologic models were developed and how applicable they are to the watersheds in the project area. Streamflow data are being collected as part of ongoing field studies.

The assessment of hydrologic impacts from the third runway project will include a review of the potential water quality impacts from the construction phase and proposed *mitigation* measures.

Glossary

Groundwater is water that exists below the ground surface. It can be derived from precipitation and surface water and usually flows to wetlands and streams.

An **aquifer** is a thick layer of sand, gravel, or other permeable material which stores water and through which water moves.

A **perched aquifer** is groundwater separated from an underlying body of groundwater by unsaturated rock. Perched groundwater is usually found in local, discontinuous zones.

Baseflow is the amount of water flowing in a stream long after it has stopped raining.

Groundwater recharge is the amount of precipitation that moves into the ground and becomes groundwater.

Wetland delineation is the establishment of wetland boundaries using a multiparameter approach requiring evidence of hydrophytic vegetation, hydric soils, and wetland hydrology. Both the U.S. Corps of Engineers and the Washington State Department of Ecology have published delineation manuals.

Wetlands **mitigation ratio** is the ratio of necessary mitigation to unavoidable wetland loss. Ratios are determined by the value of the lost wetland resource, ability to replace lost wetland function, and likely success rate of community replacement. (e.g. A project developer often is required to create new wetlands equal to three times the amount of wetlands destroyed.)

Mitigation sites are locations identified to provide compensation for unavoidable wetland loss. Site selection is based on adjacent land use, and the suitability to establish (or maintain) wetland characteristics including soils vegetation and hydrology. Mitigation sites are typically preserved/protected from future development.

Groundwater

Groundwater conditions near Sea-Tac Airport have been studied extensively by the City of Seattle, City of SeaTac, City of Des Moines, Port of Seattle, and King County. In these previous studies, *groundwater* conditions in *perched*, shallow, intermediate, and deep *aquifers* underlying the study area were described. Impacts to groundwater are more likely to occur in the perched and shallow groundwater zones where fill will be removed or added, rather than in groundwater of the deeper aquifer zones.

PGG's groundwater study will focus on the relationships between perched and shallow groundwater, wetlands, and surface water. Data from existing sources and some additional field investigations will be used. These field activities will include two rounds of *baseflow* and water quality measurements in Miller, Walker, and Des Moines Creeks. PGG completed one round of data collection this fall when groundwater levels and discharge were low. Another round of measurements will be taken this winter, when groundwater discharge increases significantly.

Currently, the Port of Seattle is conducting monthly monitoring of shallow groundwater. PGG will use these water level data in its evaluation of groundwater conditions. PGG also will collect water level data in the same wells so that independent hydrogeologic data are obtained. This fall and winter, the Port of Seattle is drilling wells in the northern proposed runway fill area. PGG will be present during this drilling in order to describe independently the soil type and conditions encountered.

The field data collected will be combined with existing data to develop models of the current groundwater and soil conditions and to assess the effects of the proposed construction on groundwater. The models of shallow groundwater conditions will be based on geologic cross sections, groundwater flow patterns, and geologic maps. The results of the models will be evaluated to predict *groundwater recharge*, perching and discharge to wetlands and surface waters under current and proposed constructed conditions.

Wetlands, Plant and Animal Life

Wetlands

Wetlands in the project area have been studied and *delineated*. The U.S. Army Corps of Engineers (USACE) verified these delineations. Approximately 18 acres of wetlands will be impacted permanently by the proposed fill embankment and runway project. E & E's wetlands study will include an analysis of the effects due to filling the 18 acres. For instance, the reduction of the amount of habitat that might result from reduction of the size of a wetland will be examined. *Mitigation ratios*, *mitigation sites*, and local wetland mitigation effectiveness will be examined. Several proposed wetland mitigation sites will be surveyed to verify that they meet the project needs compared to other available sites.

Fish

In order to assess the potential impacts that the proposed fill embankment will have on fish habitat and populations, several factors must be established. One of the most important is the suitability of the habitat for fish. Many fish habitat surveys of Miller and Des Moines Creeks have been conducted, but only one survey of Walker Creek has been done. Therefore, Walker Creek habitat will be surveyed to verify previous results and confirm habitat descriptions.

Uncertainties exist about the ability of each creek to support natural salmon or *anadromous fish* runs. A limited *dead fish survey*, a qualitative *spawner survey*, and *redd* counts on each creek will all be performed to verify previous characterizations. These surveys will be used to see if hatchery raised or natural run anadromous fish are returning to the creeks, and to establish the presence or absence of natural spawning in these creeks.

Threatened and Endangered Species

The Port's consultants are preparing a Biological Assessment that will evaluate the impacts the construction of the fill embankment will have on plant and animal life in the area, specifically threatened and endangered species. The assessment will be reviewed to evaluate whether it adequately characterizes impacts and whether there are outstanding issues that need to be addressed. If the review of the Biological Assessment indicates that threatened or endangered species could be harmed, then the mitigation measures will be evaluated.

Contaminants in Fill

Approximately 14 million cubic yards of gravel fill from an off-site source are proposed for use in construction of the third runway. A gravel mine on Maury Island has been identified as a possible source. The top 18 inches of gravel at the Maury Island mine site contains high levels of arsenic, cadmium, and lead, which will be scraped off and contained prior to mining. Ecology has stipulated that no fill for construction of the airport project will exceed the State of Washington's cleanup levels which are protective of human health. E & E is evaluating the existing soils data from the Maury Island mine site and comparing them to background values for the State of Washington. In addition, these soil data are being compared to Ecology's proposed Lowest Adverse Effects Thresholds (LAETs) for sediment to evaluate whether they would have adverse effects on aquatic life, should the fill material enter streams. Aquatic life is more sensitive to contaminants in streams than are humans.

Use of Studies' Results

The data and conclusions from the studies will be made available in as timely a manner as is possible for the constraints of the studies. Ecology's first goal is to produce scientifically sound studies, which provide valuable information on project impacts by the legislative deadline of June 30, 2000. The studies' results should be a useful information resource for interested public and legislators, as well as for permitting agencies.

Glossary

An **anadromous fish** emerges in freshwater, migrates to saltwater for the adult phase of its life cycle, and returns to freshwater to spawn.

Specifically for this project, a **dead fish survey** will investigate the numbers of hatchery-marked and un-marked dead fish.

A **spawner survey** identifies fish spawning behavior in creeks, streams, rivers, or lakes.

A **redd** is the area in the streambed where fish deposit fertilized eggs.

Questions about the Sea-Tac Runway Fill Hydrologic Impact Studies may be directed to:

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If you need this fact sheet in an alternative format, please contact Christine Corrigan at (425) 649-7254 (Voice) or (425) 649-4295 (TDD). Ecology is an Equal Opportunity employer.

