

MEMORANDUM

DATE: November 1, 2001
TO: Muffy Walker, U.S. Army Corps of Engineers
FROM: Elizabeth Leavitt, Port of Seattle
RE: Army Corps 404 Review of On-Site Borrow Areas

TABLE OF CONTENTS

	<i>Page</i>
I. OVERVIEW OF NEED FOR ON-SITE BORROW AREAS	2
II. ANALYSIS OF BENEFITS FROM USE OF THE ON-SITE BORROW SOURCES	3
A. Reduction in Traffic Impacts	3
B. Reduction in Air Quality Impacts	5
C. Cost Savings from Use of the On-Site Borrow Sources	5
III. DESCRIPTION OF CHANGES TO THE BORROW AREA PROPOSALS SINCE ISSUANCE OF THE MASTER PLAN IMPROVEMENT EISs	6
A. Borrow Areas 3 and 4	6
B. Borrow Area 1	7
IV. ENVIRONMENTAL ANALYSIS AND MITIGATION MEASURES	7
A. Summary	7
B. Borrow Area Limits of Excavation and Groundwater	8
C. Borrow Material Haul Methods	10
D. Project Design Changes to Borrow Areas 3 and 4	11
E. Managing Borrow Area Stormwater	12
F. Managing ASARCO Smelter Arsenic Concentrations in Borrow Area 4 Soils	13
G. Preserving Wetlands within the Borrow Areas	14
H. Reclamation of Borrow Area Excavation Sites	15
V. REFERENCES	16

AR 052531

In response to your request, this Memorandum provides information on the Port of Seattle's purpose and need for the on-site borrow sources and explains the environmental review and project refinements that have occurred since issuance of the FAA's Record of Decision.

I. OVERVIEW OF NEED FOR ON-SITE BORROW AREAS

From the initial stages of permitting for the Master Plan Update projects, the Port of Seattle (Port) has contemplated the use of borrow areas at the airport to obtain some of the fill material necessary for construction of the third runway embankment and other Master Plan Update improvements. An analysis of the borrow areas was included in the February 1996 Final Environmental Impact Statement (the "FEIS") and the May 1997 Final Supplemental Environmental Impact Statement (the "FSEIS") for the Master Plan Improvements.

Currently, the Port is considering three borrow areas to provide fill material. Borrow Areas 3 and 4 are contiguous and located in the City of SeaTac. The majority of Borrow Area 1 is located in the City of Des Moines.

The excavation of fill from these borrow source areas will result in the loss of the following wetland area:

- Borrow Area 1 – excavation of 1.03 acres of wetland to obtain 4.2 million cubic yards of fill material;
- Borrow Area 3 – excavation of 0.0 acres of wetland to obtain 1.0 million cubic yards of fill material; and
- Borrow Area 4 – excavation of 0.0 acres of wetland to obtain 1.3 million cubic yards of fill material.

The total fill requirement of the third runway is 17.2 million cubic yards of which approximately 3.1 million cubic yards could be generated during excavation of the new runway site. The excavated quantities that would be obtained from these borrow areas (6.1 million cubic yards) would reduce the need to import the remaining 14.1 million cubic yards of fill from off-site sources by 46 percent.

The Port needs to use the on-site borrow sources as a source for embankment fill material for two compelling reasons. First, use of on-site borrow would significantly reduce the truck traffic impacts that are associated with hauling the material from more distant locations. The reduced impacts include less traffic congestion on the state highways and local road network, less damage to the roadways, less inconvenience and greater safety to the driving public, and less air quality impacts from operating the haul trucks.

Second, use of on-site borrow will result in a substantial cost savings of up to \$45 million dollars of public funds. This savings would result from not having to purchase the fill material from a commercial vendor and from shortening the haul times and reducing the number of trucks required.

As explained below, the Port and its consultants have evaluated a number of environmental issues related to the development of on-site sources and have modified the proposal to eliminate

or reduce the project's environmental impacts.¹ Excavation of the on-site borrow areas will occur in a manner that fully protects groundwater, minimizes truck haul impacts, properly manages stormwater runoff, prevents surface water pollution, protects nearby wetlands, and provides for site reclamation.

II. ANALYSIS OF BENEFITS FROM USE OF THE ON-SITE BORROW SOURCES

A. Reduction in Traffic Impacts

Reduction in Vehicle Miles Traveled

Use of the borrow sites will greatly reduce the impacts from haul truck traffic on the road network near the Airport. The proximity of these borrow sites to the third runway fill embankment area will reduce the estimated distance traveled from an average of 20 miles one-way to 3 miles. If the Port can use Borrow Areas 3 and 4, the reduction in vehicle miles traveled (VMT) will be 1.9 million miles and 2.7 million miles respectively, for a total reduction of 4.6 million miles over proposals that exclude use of the borrow areas.

Excavation of 4.2 million cubic yards of material from Borrow Area 1 would result in a VMT reduction of approximately 7.0 million miles traveled.

The Port estimates that use of the on-site borrow areas will result in a reduction of vehicle impact equivalent to removing more than 500,000 one-way trips for passenger cars from intersections on public roads during the construction of the third runway embankment.

The excavation of Borrow Area 4 within the Washington State Department of Transportation (WSDOT) right-of-way will further reduce future traffic impacts because WSDOT will not have to remove excess fill in their right-of-way. Utilization of Borrow Area 4 material for the Master Plan projects eliminates the need for WSDOT to remove approximately 945,000 cubic yards of material, eliminates a future cost to WSDOT for the removal of the material, and reduces truck traffic impacts from that project.²

The coordination by the Port and WSDOT for use of material from Borrow Area 4 for the third runway embankment provides a double benefit in reducing the number of truck trips. It eliminates the import of 1.3 million cubic yards of material by the Port and the export of 945,000 cubic yards of material by WSDOT.

¹ The discussion in this Memorandum is designed to guide the Corps to relevant findings, conclusions and text of studies prepared to analyze the various issues associated with borrow site development. The issues addressed in this Memorandum are presented in an "overview" format with "roadmap" references to the supporting technical documentation in which the reader may review the details of various analyses, data or the results of an investigation. A Reference List of cited documents is set forth in Section V.

² Conversation with Brian Roberts, WSDOT.

Surface Traffic Congestion

The 1996 FEIS and 1997 FSEIS both examined the impact of surface traffic conditions of two construction alternatives: (1) maximum use of on-site borrow, and (2) maximum use of off-site borrow. The key difference between the two alternatives is that the use of on-site borrow would avoid long haul distances and would lessen the effect of the haul on roadway congestion. The FSEIS examined 37 roadway intersections in the immediate airport vicinity and tested 20 different possible haul routes by which material could be delivered.³ While the Port has committed to mitigating significant congestion, the FEIS identified a significant congestion condition where the Level of Service (LOS) at an intersection decreased with the project to LOS F over what would have occurred without the construction traffic.⁴

The FSEIS found that the maximum use of off-site material could lower the operating condition at a number of the regional roadways to LOS F during specific times of the day (e.g., morning peak commute hour or evening peak commute hour). The Port committed to mitigate significant haul traffic impacts by avoiding the use of the roadway during that time of day or developing the construction-only temporary interchanges from SR 509.

In addition to a significant impact at one intersection that was identified in the EIS, the project will alter service conditions (but not to a degree that reached the threshold to be significant) on several other roadways. Although the effects would not be significant and would not require mitigation, users of area roadways would experience added congestion if off-site borrow is used instead of the on-site borrow. The FSEIS compares the maximum use of on-site borrow to the maximum use of off-site borrow and illustrates the changes in level of service could be experienced at the following locations under the two scenarios:

	Max Off-Site	Max On-Site ⁵
• Des Moines Memorial/8 th Ave South	C	B
• 24 th Ave South/S. 154 th Ave	E	D
• Des Moines Memorial Road/S. 188 th	C/E	D
• Southbound SR509/SR 518	C	B
• Southbound SR 509/South 160 th	E	D
• Northbound I-5/S. 188 th	F	E
• International Blvd (SR99)/S. 192 nd	D	C

³ Until the time the Port selects a contractor for the delivery of the fill, it is not possible to identify the location where the off-site material will originate. Therefore, the FEIS/FSEIS anticipated all possible routes as the material converges upon the airport and examined each of these possibilities.

⁴ Level of service (LOS) is used to describe the operating conditions at intersections, freeway ramp junctions, or along roadway segments. Level-of-service is described by a letter ranging from "A" through "F". The highest or most efficient operation is LOS A, which indicates little or no congestion, while LOS F indicates severely congested traffic flow conditions.

⁵ FSEIS Section 5-4. Table 5-4-5.

Each of these roadways, depending on where the material is originating, could experience a reduction in level of service if the “maximum use of off-site” option is used versus the “maximum use of on-site” option. Under the Maximum On-Site scenario, only one area roadway (the on-airport Air Cargo Road at S. 170th) was found to potentially experience a reduction in service.

B. Reduction in Air Quality Impacts

Another significant benefit from using on-site borrow versus off-site borrow is that air quality will be improved as a result of reducing vehicle miles traveled. In the FEIS and FSEIS, the FAA and Port demonstrated that either maximum use of off-site borrow or on-site borrow could occur without exceeding the national ambient air quality standards, which are the standards adopted by EPA to protect public health and welfare. However, the use of the on-site borrow sources would materially reduce total project-related emissions because the travel distance associated with the on-site borrow is dramatically shorter than the off-site sources.

Use of Borrow Sites 3 and 4 would reduce vehicle miles traveled by about 4.6 million miles. This reduction in travel distance would reduce air pollutants emitted by heavy-duty diesel trucks delivering the material to the Airport by approximately 42 tons of NO_x, 34 tons of CO and 7 tons of VOC. Separately, Borrow Area 1, because of its 4.2 million cubic yards of available material, would save 7 million miles and reduce NO_x by about 60 tons, reduce CO by about 52 tons, and reduce VOC by about 11 tons. Thus, utilization of the borrow areas would prevent sizeable quantities of pollutants from being emitted into the air.⁶

C. Cost Savings from Use of the On-Site Borrow Sources

The utilization of Borrow Areas 3 and 4 will significantly reduce the costs of the Master Plan Update projects from the costs that would be incurred to import the fill material from off-site locations. The estimated cost savings from Borrow Areas 3 and 4 are approximately \$16.1 million. The estimated cost savings from Borrow Area 1 is approximately \$29.4 million.

These cost savings are based upon the Port’s recent experience in obtaining fill material. The Port has been constructing the Third Runway embankment outside of the wetland areas since 1998. The cost for importing material from off-site sources in recent contracts has been approximately \$11.00 per cubic yard. The Port estimates that the cost for excavating and hauling the material from the on-site sources will be approximately \$4.00 per cubic yard. Therefore, the savings associated with use of on-site material are approximately \$7.00 per cubic yard. Applying this value to the 2.3 million cubic yards of material available in Borrow Areas 3 and 4 indicates the Port will realize a cost savings of \$16.1 million by using these on-site sources of materials. Similarly, a savings of \$7.00 per cubic yard would yield a savings of \$29.4 million for Borrow Area 1.

⁶ FSEIS Section 5-4.

III. DESCRIPTION OF CHANGES TO THE BORROW AREA PROPOSALS SINCE ISSUANCE OF THE MASTER PLAN UPDATE EISs

In the FEIS, the Port examined eight potential borrow areas located at the Airport. The FSEIS reduced the number of potential borrow areas from eight to four due to wetland impacts, the types of material present, and operational costs.⁷ Currently, the Port proposes use of three borrow areas, which were identified as Borrow Areas 1, 3, and 4 in the FEIS.

Over time, the Port has obtained more detailed information regarding the conditions at the borrow areas and has refined its excavation objectives and reclamation plan to minimize environmental impacts. These changes from the original borrow area proposals are discussed below:

A. Borrow Areas 3 and 4

The 1996 FEIS and 1997 FSEIS both assumed maximum excavation from both Borrow Areas 3 and 4. This excavation would have provided 2.9 million cubic yards of material from Borrow Area 3 and up to 2.2 million cubic yards from Borrow Area 4.

Since that time, the Borrow Area 3 and 4 proposals have been refined to avoid wetland impacts and groundwater impacts and to buffer existing uses along the boundary of the borrow areas. As a result of these mitigation efforts, the Port's current proposal reduces the amount of excavation in Borrow Area 3 to 1.0 million cubic yards to avoid impacts to 2.35 acres of wetlands and to increase landscape buffers. The Port's current proposal for Borrow Area 4 reduces the amount of excavation by 0.9 million cubic yards (for a total excavation of 1.3 million cubic yards) in order to maintain 10 feet of vertical separation between the water table and the excavation level and to increase landscape buffers.

Both borrow areas will be reclaimed after the fill material is removed and left in a condition for future land uses that are consistent with the City of SeaTac's Comprehensive Plan for the area. The post-excavation floor elevations in Borrow Area 3 will range from 0 to 15 feet below the elevation of 18th Ave. S. From these floor elevations, the post-excavation contours will rise at a 2 percent grade towards the north and west until reaching the 2 horizontal to 1 vertical (2H:1V) final regraded side slopes.

Borrow Area 4 post-excavation floor elevations will be graded to the same level as elevations along South 196th St. and 18th Ave. S. From the streets, Borrow Area 4 post-excavation floor contours will rise at a 2 percent grade towards the south and west until reaching the (2H:1V) final regraded side slopes.

Final site reclamation will result in flat or gently sloping graded surfaces in each borrow area that will allow for several possible future uses. The limits on excavation depths and planned reclamation will not result in any large open depressions or steep slopes that would resemble landscapes commonly associated with traditional gravel pit mining operations. Reclamation of

⁷ 1997 FSEIS Section 5.4.

the borrow areas will include a minimum 50-foot landscape buffer between the borrow areas and adjacent properties and streets. As currently proposed, the southwest portion of Borrow Area 3 will remain heavily vegetated and this acreage will be protected by restrictive covenants.

B. Borrow Area 1

The majority of Borrow Area 1 is located in the City of Des Moines. In the FEIS, the Port proposed maximum excavation of the entire site, which would have yielded 6.9 million cubic yards of material and have impacted 1.40 acres of dispersed wetland. In order to reduce wetland impacts to 1.03 acres, the area of excavation was reduced, which reduced the amount of available material to 4.2 million cubic yards.

The Port is involved with the City of Des Moines' land use processes to obtain the comprehensive plan and land use regulation changes necessary to utilize Borrow Area 1. At this time, the Port has not prepared a detailed excavation and reclamation plan for Borrow Area 1.

IV. ENVIRONMENTAL ANALYSIS AND MITIGATION MEASURES

A. Summary

- Borrow area excavation for Borrow Areas 3 and 4 will maintain adequate separation from the Shallow Regional Aquifer and Perched Water-Bearing Zone, the continuous and substantial water bearing zones beneath the borrow areas.
- Borrow materials will be transported from the borrow areas to the embankment construction site by 30 ton highway dump trucks via an on-site haul route to reduce local traffic impacts and control air emissions and operating costs.
- Modifications to the footprint, depth of excavation, and volumetric estimates for resource materials in Borrow Areas 3 and 4 minimize environmental impacts and provide a more uniform recontoured and reclaimed surface that will blend into the surrounding landscape.
- All Temporary Erosion and Sedimentation Control (TESC) and permanent, post-reclamation stormwater measures will be managed in a manner that is consistent with the Washington Department of Ecology's NPDES Sand and Gravel General Permit and applicable portions of the King County Surface Water Design Manual (King County, 1998).
- Like many properties in the Puget Sound area, the first few inches of undisturbed surface soils in Borrow Area 4 contain trace amounts of windblown arsenic from the ASARCO Tacoma Smelter. The Port has developed a topsoil management plan to ensure that this soil is properly handled. This plan segregates the topsoils, which currently support a healthy vegetative cover, and requires separate stockpiling and reuse exclusively on-site for reclamation and revegetation, in a manner that ensures protection of human health and the environment.

- Borrow Area 4 extraction activities will not impact any wetland resources. The Port reduced the original excavation quantities of fill materials for Borrow Areas 1 and 3 to avoid direct and indirect impacts to the wetland located in Borrow Area 3 and to reduce those impacts to the to the maximum practicable extent in Borrow Area 1. The wetlands in Borrow Area 3 will be preserved with appropriate buffering and maintenance of hydrology.
- A borrow material development and reclamation plan for Borrow Areas 3 and 4 has been prepared to guide excavation activities reclamation and revegetation methods. The goal of the reclamation is to leave each borrow area in a condition that will be compatible with surrounding land uses. The Port will prepare a similar plan for Borrow Area 1 prior to development of its borrow materials.

B. Borrow Area Limits of Excavation and Groundwater

This section addresses the presence of a separation layer between the floor of excavation and underlying local aquifers under the proposed borrow areas. The Port has analyzed potential impacts of borrow material excavation on local groundwater resources in the 1996 FEIS and in the technical studies and plans that are cited below.

Geologic and Hydrogeologic Setting of Borrow Areas

The current borrow area proposal includes a ten-foot (10 ft.) separation layer between the floor elevation of the Borrow Area 3 materials and the underlying Shallow Regional Aquifer.⁸ A similar 10-foot layer will be used to separate Borrow Area 4 floor excavation from more continuous portions of the shallow perched water-bearing zone beneath the site.

The AGI reports indicate that the glacial deposits beneath each site include relatively permeable sands and gravels, interbedded with low-permeability glacial till or other silty/clayey members. The studies note that the primary aquifers for the project are:

Fill, Alluvium, Vashon Recessional Outwash	Perched Zones
Vashon Till	Aquitard
Vashon Advance Outwash Aquifer	Shallow Regional

The borrow area fill materials are located within the upper sequence of recessional outwash deposits and glacial till, and extend into the upper part of the advance outwash deposits. These results have been confirmed by more recent site explorations.⁹

⁸ AGI 1995, 1996. Complete report citations are reported in the References Section at the end of this Memorandum.

⁹ Hart Crowser 2000, 2001.

Potential Groundwater Impacts

The Port's consultants have monitored groundwater elevations at the borrow areas in a series of initial baseline studies and later site exploration and characterization work.¹⁰

The FEIS notes that excavation of low-permeability glacial tills might potentially affect local recharge by enhancing the rate of recharge in most areas. Another potential effect of the excavations could be to reduce seepage path length, which could theoretically increase the rate or probability of a surface contamination release reaching the uppermost aquifer. However, the post-excavation depth to groundwater within Borrow Areas 3 and 4 would be comparable to that found in existing but lower elevations east of each site. Consequently, these post-excavation conditions will be comparable to current nearby conditions and should not measurably add to the potential for impacts to groundwater.

Site explorations indicate that, in Borrow Area 3, the Shallow Regional Aquifer is present as a continuous water-bearing zone beneath the entire site. Perched water-bearing zones are also present, but discontinuous, and are expressed as surface seepage.¹¹ Upon completion of the excavation, the exposed seepage from the perched water-bearing zone will be collected and conveyed to nearby wetlands.¹² Current borrow material development plans for Borrow Area 4 provide for a 10-foot layer to separate proposed excavation from a more continuous perched water-bearing zone.¹³

¹⁰ The following reports discuss excavation volumes and hydrology analyses:

AGI 1995 FEIS – The AGI Borrow Source Study relied upon site explorations to arrive at the initial borrow material resource volumetric estimates, which were considerably larger than the current proposal. (AGI, 1995).

FEIS Chapter IV, Section 10 – Water Quality and Hydrology noted that excavation of fill material could affect groundwater recharge by removing low permeability glacial till overlying more permeable glacial outwash sands and gravels.

Hart Crowser, 1998, 1999, 2000a and 2001a – Since publication of the FEIS, the Port has conducted additional site explorations to develop a more complete understanding of local geologic and hydrogeologic conditions at the borrow Areas. These explorations have analyzed the potential impacts of the excavation on groundwater recharge or hydrology.

AGI, 1995, HNTB, 1995, FAA, 1996, Hart Crowser, 2000c – Although the Port has prepared estimates of the potential volume of borrow material available in Borrow Area 1, it has not prepared a development and reclamation plan. In each case, however, a 10-foot separation layer will limit excavation depths.

¹¹ Hart Crowser, 1999, 2000a, 2001a.

¹² Hart Crowser, 2001a and b.

¹³ Hart Crowser, 2001a and b.

C. Borrow Material Haul Methods

This section addresses the Port's selection of a haul method and haul route. Current haul method planning activities have largely concentrated on the need to transport materials from Borrow Areas 3 and 4 by truck along a haul route located entirely on Port property.¹⁴

The Port originally considered hauling material along haul routes located on either Port-owned property or public streets (1996 FEIS). Given the large volume of material required to construct the third runway embankment, the Port completed a comparative analysis of the potential environmental impacts arising from the use of combinations of on-site and off-site borrow materials in the 1997 FSEIS.

The EIS analysis clearly demonstrated that use of on-site borrow materials significantly reduces potential environmental impacts (traffic congestion & safety, air emissions, truck hauling distances – three miles compared to twenty miles, and wear and tear to public roads) caused by the added truck traffic necessary to transport comparable materials from more distant off-site sources.

In 1998, the Port examined the use of two trucking methods (30-ton highway haulers and 100-ton off-road haul trucks) and an on-site overland conveyor system. Significant delays, permitting lead-times, and substantially higher installation and handling costs led the Port to conclude that the conveyor option was not currently practicable. The Port concluded that using 30-ton highway haul trucks along a haul route situated primarily within Port-owned property was a low-cost alternative with significant environmental benefits.

In June 2001, the haul method was reviewed again with consideration given to the status of permits, timing of future projects, haul costs, productivity, efficiency, and conflicts with other Port projects. The evaluation reaffirmed the proposal to use 30-ton highway trucks.

The Port's current approach, while utilizing lower volumes of on-site borrow materials, continues to provide significant reductions in potential environmental impacts proportionate to those described in the FSEIS.

¹⁴ The following reports contain information on the Port's haul route selection process:

FEIS Chapter IV, Section 23 – Construction Impacts – examined the use of trucks or conveyors to transport or haul borrow materials from on-site sources to the embankment construction site.

FSEIS Chapter 5, Section 4 – Weighed the potential for reduced environmental impacts from the use of on-site borrow materials (minimum versus maximum utilization) against the potential for significantly increased environmental impacts should off-site borrow sources be used exclusively to construct the embankment.

Hart Crowser 1998 – The Port prepared a conceptual borrow development and transportation plan, which sought to maximize the economic and environmental benefits associated with developing smaller quantities of on-site borrow material sources, thereby reducing its demands for off-site embankment construction materials.

Hart Crowser, 2001b – The 30-ton highway truck hauling option operating along a route located exclusively on Port-owned property was designed and incorporated into the revised conceptual development and reclamation plan for Borrow Areas 3 and 4.

D. Project Design Changes to Borrow Areas 3 and 4

This section considers the effects of minor modifications to the footprint, depth of excavation and volumetric estimates for available borrow materials from each site. The FEIS included a description of excavation depths for Borrow Areas 3 and 4 that, upon further technical analysis and review, resulted in several minor proposed modifications to the planned excavation activities. These modifications include reduced volumetric estimates for available borrow materials, lower depths of excavation, and smaller excavated footprints in each borrow area.¹⁵

The FEIS descriptions of Borrow Areas 3 and 4 indicated that significantly larger areas would be disturbed and that larger volumes would be excavated. Because of a typographic error, the FEIS mistakenly reported that the maximum cut depths were not as deep (0 to 50 feet and 0 to 30 feet, respectively) as currently proposed. However, both the FEIS and the subsequent revised proposals consistently held the final excavation cut depths to 10 feet above the underlying water table.

After releasing the FEIS, the Port held discussions with the regulatory agencies and conducted additional technical analyses, resulting in several minor modifications to the borrow area proposals. These studies suggested reducing the quantity of material available in Borrow Areas 3 and 4 from what was reported in the FEIS.¹⁶

Given the desire to preserve wetlands and augment buffers, the total acreage proposed for excavation was reduced from 60 acres to 23 acres in Borrow Area 3 and from 40 acres to 34 acres in Borrow Area 4. The last minor modification provided access to resources inside the WSDOT right-of-way by merging two formerly proposed excavation sites in Borrow Area 4 into one site with slopes that would be more amenable to uniform surface recontouring and site reclamation.¹⁷

The FEIS and the current proposal are consistent in that the lower limit of the excavation will be a maximum cut of 10 feet above the water table or to the pre-Vashon drift across each of the

¹⁵ The following documents describe the volumetric measurements for the borrow sites:

Hart Crowser, 2001b and FEIS – The FEIS indicated that the available volumes of borrow materials were approximately twice that of volumetric estimates presented in current borrow area development plans, yet the excavated cut depth would be shallower than those anticipated in current plans.

AGI, 1995. HNTB, 1995 FEIS – AGI and HNTB developed baseline evaluations presenting volumetric estimates reported in the FEIS, although these estimates relied on deeper cut depths than those proposed in the FEIS.

Hart Crowser 1998, 2001b FEIS – The Port re-examined the need for access to earlier reported volumes and determined that it could provide increased environmental mitigation for wetlands and excavate smaller volumes to lower cut depth elevations while maintaining stated groundwater separation layers.

SEPA Addendum 2001 FEIS – The Port determined that these minor modifications were based on new project information and would likely produce greater environmental benefits and would not result in any unanalyzed probable significant adverse environmental impacts.

¹⁶ Hart Crowser, 2001a and b.

¹⁷ 2001 SEPA addendum.; Hart Crowser 2001b.

Borrow Areas. Later technical analyses revised this cut depth from those reported in the FEIS, and the revised cut depths are reflected in current proposals.¹⁸

The cut depths are deeper than previously reported in the FSEIS because of a typographical error in the text of that document. This error is explained in the 2001 SEPA Addendum. The change in cut depth still preserves the 10-foot limit above the water table (i.e., the Shallow Regional Aquifer beneath Borrow Area 3 and continuous portions of a perched water-bearing zone beneath Borrow Area 4).

The addition of the WSDOT SR 509 right-of-way in Borrow Area 4 is consistent with general assumptions reported in the FEIS/FSEIS and will not create any significant environmental impacts that were not addressed in those documents. Even with the addition of the WSDOT right-of-way, the new estimated quantities of material available for excavation in each Borrow Area is less than reported in the FEIS/FSEIS; the area of surface disturbance is less; the lower limit of excavation remains the same, and several wetlands will be preserved by the new proposal. In virtually all cases, the impacts from the new proposal would diminish from levels estimated by the FSEIS, especially for surface impacts and wetlands.

E. Managing Borrow Area Stormwater

This section presents the Port's approach to managing stormwater and temporary erosion and sediment control activities within the borrow areas. The Port has applied for coverage under the Washington Department of Ecology's NPDES Sand and Gravel General Permit (General Permit, Ecology, 1999) and has identified stormwater management and TESC measures in the development plan for Borrow Areas 3 and 4.¹⁹ The stages of construction and phases of implementation for stormwater management and TESC measures are described in the project Stormwater Pollution Prevention Plan (SWPPP). Proposed stormwater control measures for Borrow Areas 3 and 4 will also conform to the King County Surface Water Design Manual.²⁰

The SWPPP provides for the use of selected source control best management practices; a spill prevention, control, and countermeasures plan; and a stormwater monitoring plan.²¹ Site reclamation and revegetation will restore site conditions to a physically stable state and allow the

¹⁸ Hart Crowser, 2001b.

¹⁹ Hart Crowser, 2001b.

²⁰ King County, 1998, HNTB, 2001; Stormwater management information is presented in the following documents: Washington Department of Ecology's NPDES Sand and Gravel General Permit – describes stormwater requirements.

Hart Crowser, 2001c – Stormwater management and temporary erosion and sediment control (TESC) facilities will be installed prior to site development consistent with the General Permit.

Parametrix, 2001 – Stormwater discharges will be addressed by plans developed consistent with the General Permit identifying the measures, practices and facilities the Port will implement to meet its permit obligations.

HNTB, 2001 – The Port is presently preparing designs and specifications for the construction and implementation of stormwater management and TESC measures.

²¹ Parametrix, 2001.

Port to fulfill its obligations under the NPDES General Permit. The stormwater management facilities and TESC measures are currently being developed in a bid document package that will be implemented by the Port's earthworks contractor during the development and reclamation of Borrow Areas 3 and 4.²²

F. Managing ASARCO Smelter Arsenic Concentrations in Borrow Area 4 Soils

This section addresses the Port's management strategy for handling the first few inches of undisturbed surface soils in Borrow Area 4 that contain windblown arsenic dust from the ASARCO Smelter in Tacoma. Testing of Borrow Area 3 surface soils indicated arsenic concentrations comparable to natural background levels that do not require special consideration.²³

Surface deposition of windblown arsenic throughout the Puget Sound area from the ASARCO smelter is a regional issue, and the impacts observed at Borrow Area 4 are similar to those experienced at other undeveloped sites in south King County.²⁴ The Port has developed a topsoil management plan to address the presence of arsenic. This plan calls for removing the upper 12 inches of Borrow Area 4 topsoil, separately stockpiling these soils, and reusing them exclusively on-site for reclamation and revegetation. Before land clearing operations begin at Borrow Area 4, TESC and stormwater control structures, facilities, and management practices will be installed to ensure that any potential contamination is contained away from sensitive receptors.²⁵ At the close of the construction season, disturbed portions of Borrow Area 4 will be recontoured and topsoils will be applied to support site revegetation. Topsoils will be returned to disturbed portions of Borrow Area 4 in a thickness of approximately 1 foot. Phase 5 embankment construction, which will utilize Borrow Area 4 materials, have incorporated this topsoil management strategy into the project design and construction specifications.²⁶

²² HNTB, 2001.

²³ Discussion of soil characteristics at Borrow Site 4 can be found in the following documents:

FEIS Chapter IV, Section 16 – Plants and Animals of the Port's FEIS and Chapter 5, Section 4 – Construction of the Port's FSEIS indicate that Borrow Area 4 topsoils support healthy second growth deciduous and conifer forests (fir, cedar, alder), a healthy understory (blackberries, salal, ferns), and grasses.

Hart Crowser, 2001b, Parametrix 2001 – The Port has tested undisturbed Borrow Area 4 topsoils and determined that the first few inches contain slightly elevated arsenic concentrations created by windblown dust containing arsenic from the former ASARCO smelter in Tacoma.

Parametrix, 2001 – Best Management Practices described in the Borrow Area 3 and 4 SWPPP will provide adequate stormwater and erosion controls for the stripping, stockpiling, and reusing Borrow Area 4 topsoils.

HNTB, 2001– Designs and specifications are being developed in Phase 5 embankment construction documents providing for the separate management of Borrow Area 4 topsoils.

²⁴ Hart Crowser, 2001c, Parametrix, 2001.

²⁵ Hart Crowser, 2001c, HNTB, 2001.

²⁶ HNTB, 2001.

G. Preserving Wetlands within the Borrow Areas

The Port's approach to managing potential impacts to wetland resources has included a wide range of avoidance, enhancement, mitigation and preservation strategies for wetlands located in Borrow Areas 1 and 3. Development of Borrow Areas 3 and 4 will not have any direct impact on the wetlands located near the excavation resources within the borrow areas. Excavation of borrow materials in Borrow Area 1 would avoid nearly half of the on-site wetlands and avoid impacts to adjacent off-site wetlands.

Projected Impacts to Wetlands in Borrow Area 1

Full development of construction materials from Borrow Area 1 would likely impact approximately 1.40 acres of the 1.83 acres of wetland delineated for this site.²⁷ Revisions to the proposed Borrow Area 1 development plan reduces these impacts to 1.03 acres or less, while facilitating on-site infiltration and free drainage of direct precipitation and surface runoff into Des Moines Creek and adjoining wetlands.

Excavation-related impacts would be avoided in five wetlands by maintaining the borrow site boundary and slopes at least 50 feet away from wetland margins. Borrow material would not be extracted from areas inside the wetland buffer.²⁸ A significant portion of land along the southwestern margin of the borrow area would be managed to preserve overland flows, which contribute, in a limited manner, to the perched wetland hydrology supporting wetlands on the adjoining parcel.

While the Port has not prepared a conceptual development and reclamation plan for Borrow Area 1, current resource estimates indicate that it will not be practicable to avoid the remaining 1.03 acres of wetlands in Borrow Area 1 because:

- The preservation of these wetlands would render most of the resource impracticable to excavate; and
- Limiting the resource excavation to avoid the wetlands would still completely remove the upgradient source of water that likely is required to sustain these wetlands.

Projected Impacts to Wetlands in Borrow Area 3

Full development of Borrow Area 3 would have impacted all of the 2.35 acres of wetlands delineated within the site boundary. The Port's revisions to the Borrow Area 3 development plan avoid these impacts,²⁹ while still allowing for development of a substantial volume of construction material from Borrow Area 3.³⁰

²⁷ FEIS; Hart Crowser. 1998, 2000c.

²⁸ Hart Crowser, 2000c.

²⁹ Hart Crowser. 1998, 2000a, 2001.

³⁰ Hart Crowser. 2001b.

Hydrogeologic studies indicate the source of water feeding the Borrow Area 3 wetlands will remain intact. Surface drainage and perched seepage systems immediately upgradient will remain undisturbed and seepage adjacent to Wetland 29 will remain unimpaired. Where removal of fill material intercepts surface seepage in areas immediately to the north of these wetlands, a drainage swale and conveyance system will provide an adequate amount of water to the nearby wetlands.³¹

H. Reclamation of Borrow Area Excavation Sites

The Port has prepared a Conceptual Borrow Material Development and Reclamation Plan for Borrow Areas 3 and 4 to integrate borrow material extraction, environmental mitigation, permit obligations, and site reclamation activities.³² Site reclamation activities will return the post-excavation landforms of each borrow area to site conditions compatible with surrounding land uses.

Consistent with mitigation proposed in the FEIS, a landscaping/reclamation plan was developed and includes provisions for reclamation and revegetation (seeding and planting of shrubs and trees) of the borrow areas.³³ This plan contains the following features:

- It discusses the surrounding environment (site soils & geology, hydrogeology, wetlands, etc.);
- It presents descriptions of borrow development operations (site preparation, topsoil salvage, excavation, hauling, stormwater and erosion controls, etc.);
- It presents a conceptual reclamation and revegetation plan (reclamation goals, recontouring, topsoil replacement, slope stability, etc.); and
- It provides for monitoring of the results of the reclamation efforts.³⁴

The borrow materials have been classified as “fair-weather fill” and would be extracted during the “dry-season” months, from around mid-May to early-October each year. Borrow Area 4 is scheduled for development in 2002, and Borrow Area 3 is scheduled for development in 2003.

Borrow material development and reclamation would occur in three basic steps: site preparation, including installation of stormwater controls and TESC measures, would be followed by land

³¹ FEIS; Hart Crowser, 1998, 2000c.

³² The following documents discuss site reclamation:

1996 FEIS– The FEIS provided for the development of a landscaping plan for borrow excavation, including measures for site recontouring and revegetation.

Hart Crowser 2001b– The Port’s concepts for developing borrow materials from Borrow Areas 3 and 4 are presented alongside a plan to reclaim the resulting surface disturbances.

³³ Hart Crowser, 2001b.

³⁴ Hart Crowser, 2001b.

clearing and topsoil salvage activities. Borrow material extraction would conclude in the fall of the year in time to allow the site to be reclaimed and revegetated before the onset of winter.

Borrow Area 4 would be recontoured (2H:1V or flatter slopes), stabilized (drainage/catch benches, diversion structures, ponds), and revegetated. Borrow Area 3 would be developed and reclaimed in a similar fashion.

Interim and permanent landscaping, revegetation, and weed control measures used on the borrow areas and haul route will comply with the landscaping conditions of the Master Plan Update EIS documents and the Port's Interim Landscape standards. Revegetation concepts will address adjacent land-use issues, especially the need to avoid creating an environment that is attractive to wildlife species responsible for aircraft-bird strike hazards.³⁵ Site monitoring would allow the Port to ensure successful reclamation and demonstrate site stability for purposes of terminating the NPDES General Permit.

V. REFERENCES

The following documents were used in preparation of this Memorandum. Copies of documents not already in the Corps' record are attached to this Memorandum:

1. AGI Technologies, 1995. Borrow Source Study, Proposed New Runway, Seattle-Tacoma International Airport, SeaTac, Washington.
2. AGI Technologies, 1996. Appendix Q-A, Baseline Groundwater Study, Final Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport, Seattle, Washington.
3. FAA and Port of Seattle, 1996. Final Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport.
4. FAA and Port of Seattle, 1997. Final Supplemental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport.
5. FAA and Port of Seattle, 2001. Addendum # 4 to Final Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport.
6. Hart Crowser, 1998. Draft Resource Evaluation and Conceptual Development for Borrow Areas 3 and 4, Third Runway Project, Seattle-Tacoma International Airport. Prepared for the Port of Seattle, Seattle, Washington.
7. Hart Crowser, 1999. Subsurface Conditions Data Report, Borrow Areas 1, 3, 4, Sea-Tac Airport Third Runway. Prepared for the Port of Seattle, Seattle, Washington.

³⁵ Hart Crowser, 2001b.

8. Hart Crowser, 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.
9. Hart Crowser, 2000b. Sea-Tac Third Runway Project, Borrow Area 3 – Preservation of Wetlands. Unpublished memo by Hart Crowser to Jim Thompson, HNTB. October 20, 2000. Seattle, Washington.
10. Hart Crowser, 2000c. Third Runway Project, Borrow Areas 1, 3, and 4 – Projected Impacts to Wetlands, Seattle-Tacoma International Airport. Prepared for the Port of Seattle, Seattle, Washington.
11. Hart Crowser, 2001a. Subsurface Conditions Data Report, Borrow Areas 3 and 4, Seattle-Tacoma International Airport. Prepared for the Port of Seattle, Seattle, Washington.
12. Hart Crowser, 2001b. Final Draft Conceptual Borrow Material Development and Reclamation Plan – Borrow Areas 3 and 4, Sea-Tac International Airport. Prepared for the Port of Seattle, Seattle, Washington.
13. Hart Crowser, 2001c. Topsoil Management Plan – Borrow Area 4, Sea-Tac International Airport. Prepared for the Port of Seattle, Seattle, Washington.
14. HNTB Corporation, 1995. Investigation of On-Site Borrow Sources – 90% Progress Report, Seattle-Tacoma International Airport. Prepared for the Port of Seattle, Seattle, Washington.
15. HNTB Corporation, 2001. 90% Review Set of Project Manual Including Specifications for 3rd Runway Embankment Construction – Phase 5, by HNTB, prepared for Port of Seattle, September 26, 2001. *To be provided after completion.*
16. Parametrix, 2000a. Wetland Functional Assessment and Impact Analysis for Seattle-Tacoma International Airport Master Plan Update Improvements. Prepared by Parametrix for the Port of Seattle. Kirkland, Washington. *See Corps Administrative File No. 54E.*
17. Parametrix, 2000b. Wetland Delineation Report for Seattle-Tacoma International Airport Master Plan Update Improvements. Prepared by Parametrix for the Port of Seattle. Kirkland, Washington. *See Corps Administrative File No. 43A.*
18. Parametrix, 2001. Sand and Gravel Stormwater Pollution Prevention Plan, Borrow Areas 3 and 4, Seattle-Tacoma International Airport. Prepared for the Port of Seattle, Seattle, Washington.
19. Port of Seattle, 1999. Draft Wetlands Re-Evaluation Document, Seattle-Tacoma International Airport Master Plan Update Improvements, Seattle, Washington. *See Corps Administrative File No. 26.*