

**ADDENDUM TO FACT SHEET
PORT OF SEATTLE
SEA-TAC INTERNATIONAL AIRPORT
Modification of NPDES Permit Number WA-002465-1
in Compliance with Requirements of the
Pollution Control Hearings Board**

SUMMARY

The Department of Ecology (Department) issued NPDES Permit No. WA-002465-1 to the Port of Seattle (Port) on September 4, 2003. The permit was appealed and, following a hearing, the Pollution Control Hearings Board (PCHB or Board) issued its Findings of Fact, Conclusions of Law and Order (Order) on October 18, 2004. In the Order, the PCHB remanded the permit and required the Department to address several shortcomings in the permit. This Fact Sheet Addendum contains the basis for the changes proposed to be made in the permit as a result of the PCHB's Order.

REQUIREMENTS SET FORTH BY POLLUTION CONTROL HEARINGS BOARD

The Board required the Department to address the following aspects of the permit on remand:

- **Department must include AKART requirements in permit and incorporate interim limitations on wastewater from Industrial Wastewater System:**

The PCHB directed the Department to evaluate two alternatives for compliance with the AKART requirement set forth under state law for contaminated wastewater collected in the Port's Industrial Wastewater System (IWS):

- Discharge of all of deicing contaminated wastewater to King County's Publicly Owned Treatment Works (POTW), and
- Separation of high strength glycol streams, combined lagoon aeration.

The PCHB stated that the AKART analysis should also incorporate consideration of whether the permit should contain a limit on total pounds of BOD discharged into Puget Sound. The PCHB's Order requires the Department to require the Port to implement AKART as soon as possible, and to include interim limits for BOD in the permit, as well as any other nonconstruction measures to achieve water quality criteria.

- **Department must impose water quality-based interim effluent limitations (narrative or numeric) on discharges from the Industrial Wastewater Treatment Plant at a minimum** *"Given the Port's failure to come into compliance with water quality standards for IWTP effluent for over ten years, allowing a compliance schedule delaying water quality compliance further is in violation of WAC 173-201A-160(4)(c). The permit provisions relating to IWTP effluent compliance with water quality standards should be*

remanded to Ecology. While it may not be physically possible for the Port to immediately comply fully with water quality standards, Ecology must, at a minimum, impose narrative requirements requiring use of all nonconstruction measures to achieve water quality criteria and impose interim effluent limitations (narrative and/or numeric) - WAC 173-201A-160(4)(b)&(c). Utilization of the expanded lagoon system and the Port's ability to contain much of a high BOD first flush in one of the smaller lagoons for aeration, or any other disposal manner need be explored. Continuing the same practice of discharging highly polluted water into Puget Sound without effective BOD treatment is unacceptable under the governing regulations." Conclusion of Law 28, pages 53-54.

- **Wetland Specialist Review of Lake Reba Required to Determine if it is a Water of the State-Interim Monitoring of Lake Reba Effluent Required:** Depending on outcome of the wetland specialist's review, the Department must require monitoring either into Lake Reba or at the point it discharges to Miller Creek. *"The permit should be remanded to Ecology for further review and appropriate permit modifications based upon professional wetland analysis of the Lake Reba site. In the interim, until a proper determination can be made of the status of Lake Reba, discharge monitoring should be added at the outfall from Lake Reba to Miller Creek. If Lake Reba is not ultimately considered a water of the state, the facility is undeniably discharging into Miller Creek, an undisputed water of the state. Under its existing analysis of Lake Reba, Ecology has no basis for failing to require monitoring of its discharges into Miller Creek and development of appropriate BMPs and/or effluent standards for such discharges."* Conclusion of Law 33, pages 57-58.
- **Compliance Schedule Consistent with WAC Required for Lake Reba Monitoring:** *"To the extent the Port is responsible for discharges to and/or from Lake Reba, the water quality maximum compliance schedule of WAC 173-201A.160(4)(c) is applicable."* Conclusion of Law 30, page 55.
- **BOD and COD Analysis Must be Included in Comprehensive Receiving Water Study:** *"The required study should be modified to be consistent with Ecology's position on BOD and COD at the hearing. Measuring DO is also appropriate. Addition of the BOD, COD and DO parameters should address ACC/CASE's objection that the study does not evaluate the impact of deicing and anti-icing operations."* Conclusion of Law 39, pages 62-63.
- **SDS3 Effluent Must be Included in Comprehensive Receiving Water Study, Department Should Consider Accelerated Deadline for Completion of Study:** Requirements related to SDS3 must be modified and the Department should consider whether study can be completed in less than four years. *"The Comprehensive Receiving Water and Stormwater Study Condition should be clarified to ensure effluent from SDS3 is included in testing, to incorporate one-hour average tests consistent with WAC 173-201A-040, as needed, and to require grab samples during the first thirty minutes of a storm event, as possible, for some or all of the testing events. In revising the Condition S6, Ecology should also evaluate whether the study can be completed in less than four years. Given the long history of unmonitored potentially toxic discharges into*

area waters, all possible speed should be used in developing this information so BMPs can be identified and implemented at the earliest possible time. In addition, Ecology should consider whether discharges from the outfall from the Northwest Ponds to Des Moines Creek should be explicitly included in the study to provide a more comprehensive picture of water quality problems, pollutant sources, and BMP performance."

Conclusion of Law 41, page 64.

- **Acute and Chronic Toxicity Testing Requirements Must be Modified to Require Testing of Effluent when Deicing Agents are Present in Effluent:** *"To comply with the requirements of WAC 173-201A-040, the acute toxicity testing portions of the Permit should be remanded to Ecology and the testing program modified to assure a meaningful portion of the testing will occur when deicing agents and their toxic constituents are present."* Conclusion of Law 44, page 66. The Boar

"The chronic toxicity testing condition in Part I should be remanded to Ecology for revision to incorporate deicing events as a necessary part of the testing plan."

Conclusion of Law 45, page 67.

- **Changes Required in Chronic Toxicity Testing Requirements in Part II:** *"Based upon the scientific evidence, the permit provisions for chronic toxicity testing in Part II should be remanded to Ecology for incorporation of clarifications including: (1) in-stream testing locations, (2) more flexibility in the dates for taking samples, (3) identification of the version of the E-test being required, and (4) removing reference to using the results to establish compliance with whole effluent toxicity standards. The Port did not meet the burden of showing the test results should not be used for a possible toxicity identification/reduction evaluation, if it was indicated. WAC 173-205-100. Ecology's position on that issue is upheld and should be clarified in the permit language on remand."* Conclusion of Law 46, page 67.
- **AKART Must Be Implemented before Mixing Zone Can be Applied:** *"This permit allows a mixing zone even though AKART has not been fully implemented. The permit should be clarified to make the mixing zone effective only after AKART for the IWTP has been implemented."* Conclusion of Law 48, page 68.
- **Permit cannot provide for informal modification of its conditions.** *"Permit language enunciating Ecology's reservation of modification authority should be changed to clarify that any permit modifications must be conducted pursuant to the applicable process under state and federal law."* Conclusion of Law 49, page 70. This includes Condition S2B (Ex. 1, p. 15), Condition S.1.F (Ex. 1, p. 41), Condition S.5.A.4. (Ex. 1, p.47) and Condition S.1.C. (Ex. 1, p. 68).

CHANGES TO PERMIT PROVISIONS MADE BY THE DEPARTMENT IN RESPONSE TO RULING OF THE POLLUTION CONTROL HEARINGS BOARD:

DEPARTMENT MUST INCLUDE AKART LIMITATIONS IN PERMIT:

The PCHB's order contained the conclusion that the Department's AKART analysis was based on erroneous information, and therefore the Department must reevaluate AKART in light of new information. Under the existing permit, the Port is required to send contaminated wastewater runoff collected in the Industrial Wastewater System (IWS) to King County's Renton POTW when the BOD₅ concentration exceeds 250 mg/L. The Renton POTW is a wastewater treatment facility that is capable of providing biological secondary treatment to the Port's IWS contaminated runoff. The Renton POTW discharges treated wastewater through a 10,000-foot effluent line to Puget Sound at the depth of 700 feet.

Federal Secondary Treatment Standard Considered to be Consistent with AKART

Secondary wastewater treatment, as employed at the Renton POTW, is a well recognized treatment for BOD, an important constituent in the Port's discharge. The Port's IWS contaminated runoff contains large amounts of waste glycol, an oxygen demanding chemical, which results from deicing activities. According to the King County Industrial Waste Section, the Renton POTW is capable of receiving and treating the *entire* flow of glycol-contaminated runoff from the Port's IWS. The PCHB determined that this fact was not given sufficient weight in the initial AKART evaluation associated with the appealed permit.

The present draft permit is based on the recognition that secondary treatment is consistent with AKART for addressing the Port's discharge from the IWS. The permit contains interim limitations, as well as compliance schedules to allow the Port a realistic time frame to build an adequate system to transport its IWS effluent to the Renton POTW, when the BOD₅ concentrations are expected to result in a monthly average of greater than 30 mg/L. The Department has decided to require this treatment option because biological treatment systems are not only known and available, but economically reasonable as demonstrated by their use at many other major airports in the United States (See Table in Appendix A).

Final Effluent Limitations

The proposed permit contains provisions for final effluent limitations which authorize discharge of IWS effluent directly to Puget Sound, by means of the Midway Outfall, during those times in which the IWS effluent BOD₅ concentration is expected to result in a monthly average of less than 30 mg/L.

The proposed final effluent limitations for BOD and TSS are based on the federally-determined effluent limits for secondary treatment, which the Department considers to be consistent with state AKART requirements. The proposed final effluent limits for other parameters, mainly metals, are based on water quality criteria set forth in WAC 173-201A with allowance for a mixing zone, after AKART is implemented.

The Port submitted an Economic analysis to support the Engineering Study and Addendum submitted earlier. The report called “Supplemental Information to Support Economic Reasonableness Determination of Industrial Waste System AKART Alternatives” in which an AKART limitation was developed based on cost analysis of unit treatment costs. The Department rejects unit treatment cost analysis presented in the Addendum as a rationale for determining AKART limitations for the airport. A brief review of the contents of the report and the Department’s reasons for rejecting arguments set forth in the Addendum are contained in Appendix B.

The Department has determined that the value of the set point is an internal process control variable, and hence, should not be regulated by this permit. It is therefore the Port’s responsibility to employ a set point expected to capture enough pollutants to ensure compliance with the effluent limits.

Final Effluent limits for BOD₅, effective on July 2007:

Monthly Average Limits	30 mg/L
Daily Maximum Load	2077 lbs/day

The daily maximum mass limitation for discharge of BOD₅ to the King County POTW is based on the hydraulic capacity of the IWTP and the monthly average BOD concentration limit. Based on this criterion, the maximum daily load is 2077 lbs/day.

Interim Effluent Limitations

The interim limits are provided to the Port to provide a reasonable time frame to achieve compliance with final water quality effluent standards. The interim limit calculated for BOD is performance-based, and in other cases, such as those for heavy metals, is obtained directly from the Port’s AKART engineering reports.

Based on this analysis, the maximum daily discharge limitations for BOD₅ interim period will be set at:

Interim Effluent limits for BOD₅:

Daily Maximum Limit	26,000 lbs/day	1000 mg/L
Monthly Average Limit	9000 lbs/day	N/A

The interim effluent concentration limits were derived from the Port’s Annual Industrial Waste Treatment Plant Monitoring Report for 2003-2004. The maximum BOD mass load discharged during 2003 – 2004 was 85,764 pounds per day. The average mass loading was calculated based on the procedure prescribed by USEPA’s Technical Support Document. The average mass loading during this period was about 7500 pounds per day.

Prior to the final compliance date, the Port must utilize all available options to ensure that the interim limits are met. Such options may include, but are not limited to: segregation, sweeping, lagoon management, aeration, preventions and source control.

The following were taken from the AKART, 1995 Engineering Report submitted by the Port of Seattle to develop the maximum daily concentration limits:

mg/L	Copper	Lead	Zinc
Mean	0.051375	0.31125	0.1775
Standard Deviation	0.0147812	0.0199375	0.036875
Min	0.025	0.012	0.12
Max	0.082	0.11	0.32

Interim performance-based effluent limits were also developed for other wastewater constituents and will be in effect until AKART is fully and successfully implemented. The maximum daily concentrations for those constituents are:

Parameter	Daily Maximum Limit (µg/L)
Copper	86
Lead	358
Zinc	263
Benzene	19
Toluene	71
Ethyl benzene	11
Total Xylene	221
Naphthalene	167
Total Glycol ^a	2178

^a Total Glycol is the sum of Ethylene and Propylene Glycol.

µg/L	Benzene Met. 602	Toluene Met. 602	Ethyl Benzene Met. 602	Total Xylene Met. 602	Naphthalene Met. 625	Ethylene Glycol	Propylene Glycol
Mean	5.175	23.15	3.665	70.6625	37.7062	417.286	158
Standard Deviation	5.86899	20.6362	2.9539	64.4566	55.7091	516.565	172.534
Min	0.5	0.5	0.5	4.65	4.85	36	36
Max	17	58	8.2	170	38,000	1300	280
MDL	0.2	0.2	0.2	0.2	1.6		
Instrument	GC/PID	GC/PID	GC/PID	GC/PID	GC/MC		

DEPARTMENT MUST DESIGNATE STATUS OF LAKE REBA

The Board remanded the permit to the Department for further review and appropriate permit modifications based upon professional wetland analysis of the Lake Reba site. The Board also ordered the Department, in the interim, to add discharge monitoring requirements at the outfall from Lake Reba into Miller Creek until a proper determination can be made of the status of Lake Reba. The Board concluded that while it may be determined that Lake Reba is not a water of the state, the facility still discharges into a water of the state, Miller Creek. As a result, discharges into Miller Creek from Lake Reba must be regulated by the permit.

As a result of the Order, the Department asked its wetland specialist to analyze Lake Reba for designation. Based on this analysis and soil sampling taken by the Department's Wetland Specialist, it was concluded that Lake Reba is clearly a wetland and needs to be regulated as a water of the state. Therefore, state water quality criteria must be applied to all outfalls discharging into Lake Reba and any surrounding wetlands discharging into the lake. Part II, Condition S1 of the permit has been modified to incorporate these changes. However, since Part II's compliance schedule to design and install proper BMPs for all outfalls discharging into waters of the state is no later than December 31, 2007, interim measures and monitoring of the Lake Reba outfall is necessary to ensure compliance with state water quality criteria.

CHANGES IN REQUIREMENTS RELATED TO COMPREHENSIVE RECEIVING WATER STUDIES (Special Condition S6., Part II)

The Board ordered the Department to include further requirements for the BOD, COD, and DO in Condition S.6, Part II, in response to the ACC/CASE's objection that the Special Condition S6 did not contain an evaluation of the impact of deicing and anti-icing operations. The Board also required the Department to modify the study to include outfall SDS3 and to complete the study in less than four years, if possible. In addition, the PCHB ordered the Department to require one-hour average sampling consistent with WAC 173-201A-040 as needed, and to require grab sampling during the first thirty (30) minutes of each storm event, if possible, for all of the testing events. The Department was also ordered to consider whether discharges from the outfall from Northwest Ponds to Des Moines Creek should be explicitly included in the study to provide a more comprehensive picture of water quality problems, pollutant sources, and BMP performance.

Condition 6 of Part II has been modified to include outfall SDS3 in the study, and to require the Port to collect grab samples during the first thirty (30) minutes of each storm event for as many storm events as possible. As part of this report, the Port is required to study outfall SDS7 discharges into Northwest Ponds and determine if this discharge has any effect on Des Moines Creek, its ultimate discharge point. The Port is also required to incorporate one-hour average testing protocols consistent with the WAC 173-201A-040, as needed, and if possible.

ACUTE AND CHRONIC TOXICITY TESTING REQUIREMENTS DELAYED UNTIL IMPLEMENTATION OF AKART (Part I of Permit)

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent. This approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

In accordance with WAC 173-205-040, the Port's effluent has been determined to have the potential to contain toxic chemicals. The proposed permit would ordinarily contain requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. However, the Port is improving pollution control in order to meet other regulatory requirements. The results of an effluent characterization for toxicity would not be accurate until after the improvements have been completed.

Special Conditions S3 and S4, Acute and Chronic Toxicity, were modified to require the Port to continue effluent characterization until an ACEC and CCEC are determined. WAC 173-205-030(4) allows the Department to delay effluent characterization for whole effluent toxicity for existing facilities that are under a compliance schedule in a permit to implement technology-based controls or to achieve compliance with surface water quality-based effluent limits.

CHANGES IN ACUTE AND CHRONIC TOXICITY MONITORING PROCEDURES (Part II of Permit)

The Board remanded the permit to the Department to incorporate following clarifications into the permit:

- 1) In stream testing locations
- 2) More flexibility in the dates for taking samples
- 3) Identification of the version of the E-test being required, and
- 4) Removing references to using the results to establish compliance with whole effluent toxicity standards.

The permit will be modified and the Board requirements incorporated into the permit.

MIXING ZONES BECOME EFFECTIVE AFTER AKART IS IMPLEMENTED

The PCHB ruled that the permit's mixing zones cannot be effective until AKART is completed. As a result, the permit will be issued with performance-based effluent limits for conventional, nonconventional, and toxic pollutants. Mixing zones may be added to the permit, if appropriate, once AKART is fully implemented.

REMOVAL OF CONDITIONS RELATING TO INFORMAL MODIFICATION

The Board ordered the Department to modify the permit language to eliminate authorization of informal permit modifications. According to the Board's Order, permit modifications must be conducted pursuant to the applicable process under state and federal laws. The permit has been modified accordingly with all references to informal permit modification removed from the permit or replaced with language referring to the formal permit modification procedure.

CHANGES TO PERMIT BASED ON SETTLEMENT AGREEMENT BETWEEN DEPARTMENT AND PORT

The Port also appealed the permit, challenging various provisions. Before the close of the hearing before the PCHB, the Department and the Port reached a partial settlement of the Port's appeal. The Settlement Agreement was presented to the Board and it was accepted. The permit has been modified in conformance with the Settlement Agreement. Appendix C contains the full text of the stipulated agreement. Here are some of the changes required.

1. Part I, Condition S4.A – date for submission of effluent characterization report changed from March 1, 2004 to March 1, 2005;
2. Part I, Condition S4.A – deleted last paragraph regarding Pacific oyster and mussel test protocol.
3. Part I, Condition S7.A – revised design criteria for Daily Peak Flow at Maximum Overflow Rate of 4.1 GPM of 7.7 MGD to Daily Peak Flow at Maximum Overflow Rate of 4.1 GPM/SF of Dissolved Air Flotation Surface Area of 7.1 MGD.
4. Part I, Condition S10 – changed milestone for Design Completion from August 13, 2003 to July 1, 2005.
5. Part II, Introduction – revised language regarding collection of samples prior to mixing with any other flow to state “Samples shall be collected immediately after applicable BMP(s).”
6. Part II, Condition S1.A – amend first sentence to make clear that permit authorizes discharges of stormwater associate with industrial activity to waters of the state.
7. Part II, Condition S1.A, Table 1 – modified parameter associated with turbidity monitoring from Turbidity-NTU changed to TSS-mg/L and sampling type from Grab to Flow Weighted Composite.
8. Part II, Condition S1.B – revised first sentence to remove phrase “to the receiving water.”

9. Part II, Condition S1.B, Table 2 – modified parameter associated with turbidity monitoring from Turbidity NTU-1 changed to TSS-mg/L and sampling type from Grab to Flow Weighted Composite. Renumbered last footnote as “5” and applied footnote 5 to parameter Ammonia.

OTHER CHANGES AS A RESULT OF THE PERMIT MODIFICATION:

As a result of changes to the permit, i.e., anticipated changes to the Lake Reba status and others, the Port of Seattle requested the Department to include more outfalls to the list of the permitted outfalls under Part III of the permit. These new outfalls will comply with the Section S1 and S2, Part III, of the permit. In addition, the list of outfalls under Part II was also modified. Due to work activities in the vicinity of outfalls SDS5, SDS6, and SDS7, the Port is consolidating these outfalls. The consolidation would result in eventual elimination of SDS7. Under Part I, the Midway Sewer District is relocating and installing a new outfall in the vicinity of the existing outfall. The existing outfall will be abandoned and will not be used for disposal of the treated IWTP wastewater from the Midway Sanitary Sewer. The new outfall is also a shared outfall as the existing ones and is expected to provide improved mixing. The location of the new outfall was also be added to the permit cover page. The new outfalls added under Part III, Special Condition S1.A:

EXISTING OUTFALL LOCATION	RECEIVING WATER	SAMPLING POINT
Latitude: 47° 28' 15" N Longitude: 122° 19' 00" W	Miller Creek #14-A	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 19' 00" W	Miller Creek #15-A	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 19' 15" W	Miller Creek #16-A	At the Point of Discharge
Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 28	At the Point of Discharge
Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 28 -A	At the Point of Discharge
Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 28 - B	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 18' 45" W	Miller Creek # 29	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 18' 45" W	Miller Creek # 29-A	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 18' 45" W	Miller Creek # 30	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 18' 45" W	Miller Creek # 30-A	At the Point of Discharge
Latitude: 47° 28' 00" N Longitude: 122° 18' 45" W	Miller Creek # 30-B	At the Point of Discharge
Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 30-C	At the Point of Discharge

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Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 30-D	At the Point of Discharge
Latitude: 47° 28' 15" N Longitude: 122° 18' 45" W	Miller Creek # 30-E	At the Point of Discharge
Latitude: 47° 25' 45" N Longitude: 122° 19' 00" W	Des Moines Creek #4-A	At the Point of Discharge
Latitude: 47° 25' 45" N Longitude: 122° 18' 45" W	Des Moines Creek #5-A	At the Point of Discharge
Latitude: 47° 26' 00" N Longitude: 122° 18' 15" W	Des Moines Creek # 11-A	At the Point of Discharge
Latitude: 47° 25' 45" N Longitude: 122° 18' 15" W	Des Moines Creek #12-A	At the Point of Discharge
Latitude: 47° 25' 45" N Longitude: 122° 18' 15" W	Des Moines Creek #12-B	At the Point of Discharge
Latitude: 47° 25' 30" N Longitude: 122° 18' 15" W	Des Moines Creek #13-A	At the Point of Discharge
Latitude: 47° 25' 30" N Longitude: 122° 18' 15" W	Des Moines Creek #13-B	At the Point of Discharge
Latitude: 47° 25' 15" N Longitude: 122° 18' 15" W	Des Moines Creek #25	At the Point of Discharge
Latitude: 47° 27' 45" N Longitude: 122° 17' 15" W	Gilliam Creek #26	At the Point of Discharge
Latitude: 47° 27' 45" N Longitude: 122° 17' 00" W	Gilliam Creek #27	At the Point of Discharge
Latitude: 47° 27' 30" N Longitude: 122° 17' 00" W	Gilliam Creek #27-A	At the Point of Discharge

APPENDIX A

AIRPORTS EMPLOYING SECONDARY TREATMENT FOR
REMOVAL OF BOD FROM DEICING WASTEWATER

Airport	Permit Condition for BOD ₅	Achieved Level of Control	Treatment Method	Capital Cost	Annual Operating Cost
Chicago O'Hare	<u>Outfall A</u> Monthly Average 10 mg/L Daily Max 20 mg/L <u>Outfall B</u> 20 mg/L Monthly Average 40 mg/L Max Daily		Discharge to POTW	\$98 million	\$1 million
Kansas City International	30 mg/L Monthly, 45 mg/L Daily		Discharge to POTW	\$8.5 million	Not Available
Salt Lake City International	25 and 35 mg/L October-March Monitor Only April-Sept		Glycol recycling recovery system, discharge to POTW	\$28 million	\$760,000
Buffalo-Niagara International Airport	Daily Max: 30 mg/L		Discharge to POTW	\$5.4 million	
San Francisco International	Daily Max: 60 mg/L Weekly Average: 45 mg/L		On site recycling	\$28 million	
Metro Nashville Airport Authority	<u>During Winter</u> <u>Streams > 3.0 cfs:</u> Monthly: 65 mg/L Daily: Report <u>Streams 1.0 – 3.0:</u> Monthly: 65 mg/L Daily: 97.5 <u>Streams 0.5 – 1.0 cfs:</u> Monthly: 45 mg/L Daily Max: 68 mg/L <u>Streams < 0.5 cfs:</u> Monthly: 25 mg/L Daily: 38 mg/L		Aerobic biological treatment Discharge to POTW		
Greater Rockford Airport, Rockford, IL (RFD)		3-10 mg/l	Aerobic biological treatment system	\$1.8 Million	\$176,000
Westchester County Airport		34 mg/L carbonaceous BOD ₅	Trucking to an aerobic biological process		

Baltimore/ Washington International			Discharge to POTW	\$22 million	
Washington Dulles International			High Strength glycol recycling, discharge to POTW Vacuum trucks in confined area		
Albany International Airport		39-75 mg/L	Anaerobic biological treatment system in two fluidized bed biological reactors Recently installed aerobic polishing filtration units	\$30 million	\$325,000
London Heathrow		Achieved reductions from 240 mg/L to 40 mg/L	aeration, storage and reed beds		
Portland International			High Strength to POTW Lower Strength to aerated retention pond for biological pretreatment	\$31 million	\$700,000
Syracuse Hancock International Airport		20 mg/L	Aeration, seeding with nutrients buffer and microorganisms		
Munich Airport			Runway runoff discharged to POTW Taxiway runoff to on-site biodegradation treatment system		
Proposed Sea-Tac	Daily or Monthly 30 mg/L		Discharge to POTW James Sifford of the King County DNR East Division Reclamation Plant at Renton stated in adequate capacity and BOD ₅ treatment is available Further the King County conveyance system is fully adequate to handle all of Sea-Tac's industrial waste water	Estimated: \$16.5 million	\$4.1 million

APPENDIX B

EVALUATION OF PORT OF SEATTLE ECONOMIC REASONABLENESS ANALYSIS

The Port of Seattle submitted an Economic Analysis called “Supplemental Information to Support Economic Reasonableness Determination of Industrial Waste System AKART Alternative” in March 2005 to justify the reasonableness of its chosen AKART alternative. The previous AKART Engineering Report (submitted in 2002) indicated that the Port would install a BOD analyzer to divert the less-concentrated (less than 250 mg/L) pond effluent flows to Puget Sound, and the more highly concentrated flows (greater than 250 mg/L) to the Renton POTW. However, as the economic portion of the AKART analysis was never conducted, and as the set point of 250 mg/L was arbitrarily set, the PCHB ordered the Department to complete the AKART analysis by making the economic determination. The final conclusion of the Port’s March 2005 Economic Analysis was to utilize a BOD₅ set point of 175 mg/L. That is, any flow above this set point will be diverted to certain storage areas prior to discharge to the POTW and any flow below this set point will be diverted to dedicated storage prior to discharge to Puget Sound. The analysis was prepared to determine the Best Practicable Technology (BPT) as the first test by using the plot of cost per pound of BOD removed at various set points. The inflection (or “knee”) of the curve indicates the region where unit costs of treatment increase steeply. The report contained the recommendation that the BPT effluent limits be set at 175 mg/L. However, there is no basis in federal law, or economic theory, that the inflection point of the curve be a key determining factor in determination of BPT-based effluent limitations. Application of the inflection point for determining BPT-based limitations has been considered by the Fifth Circuit Court of Appeals, and rejected the argument that the Clean Water Act (CWA) required the use of “knee of the curve” cost test in setting BPT effluent limits. The court wrote that:

“The CWA contains no specific statutory language establishing a BPT ‘knee of the curve’ test or any other quantitative cost-benefit ratio test for BPT....The courts of appeal have consistently held that Congress intended Section 304(b) to give EPA broad discretion in considering the cost of pollution abatement in relation to its benefits and to preclude the EPA from giving the cost of compliance primary importance.” (p.204, Chemical Manufacturers Association vs. USEPA.)

The Department examined the Port’s Economic Analysis report and determined that, for conventional pollutants (BOD and TSS), the minimum treatment level to be consistent with BPT and AKART is secondary treatment to achieve a monthly average concentration for BOD₅ and TSS of no greater than 30 mg/L. This conclusion is consistent with the Department’s 1991 document entitled “Economic Reasonableness Tests for NPDES and State Wastewater Discharge Permits.” Many similar airports in United States are already meeting this limit, or making significant progress toward achieving it (See Table in Appendix A). The Department believes airports in this country have typically chosen to discharge to POTWs is because treatment by POTWs is typically the lowest-cost alternative to meet the secondary treatment requirement. The

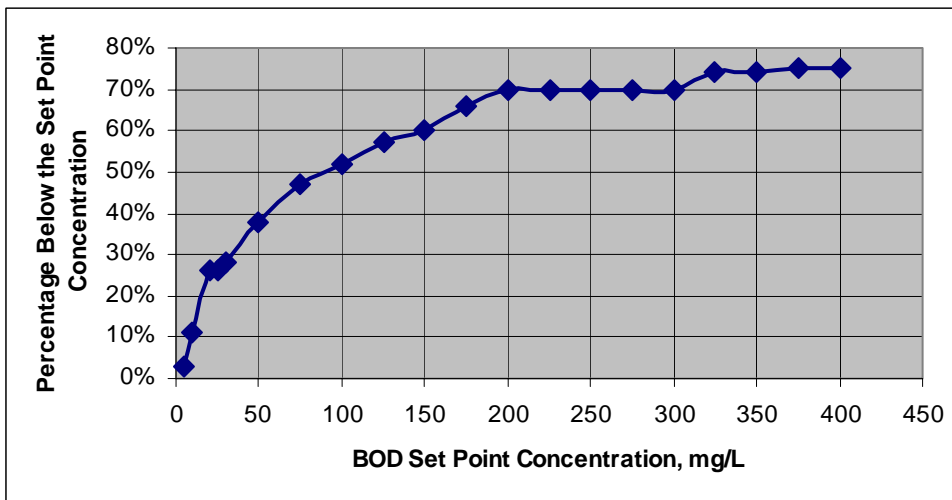
Port of Seattle’s 1988, Addendum to the IWS Engineering Report also reflected a similar opinion. The Addendum contained a proposal for 100% capture and transfer of the Port’s IWS effluent to King County’s Renton POTW. This Addendum also recommended elimination of the Port’s outfall (i.e., the shared portion of the outfall) to Puget Sound.

The AKART Economic Analysis contained recommendations for discharge limitations determined by the concentration below which it would have been uneconomical to discharge the flow to the King County Renton sewage treatment plant. According to the AKART Economic Analysis, the following effluent volumes and BOD₅ loadings could be expected to be discharged to King County at BOD₅ set points of 30 mg/L and 175 mg/L, respectively:

Set Point @	30 mg/L BOD₅	175 mg/L BOD₅
Percent Volume to King County	36%	13%
Percent BOD₅ Loading to King County	99%	98%

Based on data collected during 2003 and 2004 provided as part of the Economic Analysis Report, a set point of 175 mg/L for BOD₅ is likely to result in a long term average of 30 mg/L BOD₅. In addition, raw data for Lagoon 3 from the Annual Industrial Waste Treatment Plant Monitoring Report submitted in September 2004 indicated the following values for pond effluent:

Minimum BOD ₅ concentration	4 mg/L
Maximum BOD ₅ concentration	5910 mg/L



During the monitoring period, no segregation of concentrated flows was taking place. The average BOD₅ concentration of log-normally distributed data below 175 mg/L is 34 mg/L. The average concentration of log-normally distributed data below 150 mg/L is 29 mg/L. Below 125 mg/L it is 27 mg/L, below 100 mg/L it is 24 mg/L, below 75 mg/L it is 21 mg/L, and below 50 mg/L it is 16 mg/L. Considering the fact that about 66% of the current data were below 175 mg/L, and about 28% of these data were below 30 mg/L, during this period when no flow

segregation was taking place, it is unlikely that after flow segregation, the expected concentration of the content of Lagoon 3 would be greater than 30 mg/L. Therefore, if the Port segregates and discharges the concentrated flows to the Renton POTW immediately, without allowing them to be diluted with relatively cleaner subsequent stormwater flows, the content of Lagoon 3 can be expected to be relatively clean stormwater. Based on this data, it appears that about 42% of the data below 175 are below 30 mg/L, which is an indication that proper segregation would be feasible, and would be expected to result in an effluent value of 30 mg/L. Secondly, the set point must be set at a level to capture and transfer all flows that may result in AKART-limit violations to the Renton POTW during the deicing season. Not diverting all flows to the Renton POTW during the deicing season and allowing it to be mixed (and eventually diluted) with other relatively cleaner stormwater may appear to be intentional dilution of pollution. Deliberately commingling stormwater with process water (in this case, contaminated stormwater) is prohibited. Keeping the relatively cleaner stormwater separated from the highly concentrated and contaminated stormwater to the extent possible is the best management practices that the Port must employ.

APPENDIX C

STIPULATION BETWEEN ECOLOGY AND PORT OF SEATTLE FOR MINOR CHANGES

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POLLUTION CONTROL HEARINGS BOARD
FOR THE STATE OF WASHINGTON

THE PORT OF SEATTLE,
Appellant,
v.
STATE OF WASHINGTON, DEPARTMENT
OF ECOLOGY,
Respondent.
AIRPORT COMMUNITIES COALITION,
CITIZENS AGAINST SEATAC
EXPANSION, and PUGET SOUNDKEEPER
ALLIANCE,
Appellants,
v.
STATE OF WASHINGTON, DEPARTMENT
OF ECOLOGY, and PORT OF SEATTLE
(SEA-TAC INTERNATIONAL AIRPORT)
Respondents.

PCHB Nos. 03-140, 03-141, 03-142

STIPULATION BETWEEN
ECOLOGY AND PORT REGARDING
ISSUES 1, 5, 11, 13 AND 14

Appellant Port of Seattle (Port) and Respondent Department of Ecology (Ecology) hereby enter this stipulation regarding the following issues: Issue 1 (Whether the effluent limits for stormwater in the NPDES Permit, including the lack of compliance schedules for meeting the effluent limits, are lawful and appropriate?); Issue 5 (Whether conditions in the

1 NPDES Permit relating to nonconstruction stormwater turbidity, including the choice of
2 parameters and the type of sampling required, are lawful and appropriate?); Issue 11 (Whether
3 the interim “milestone” dates for the AKART pipeline in the NPDES Permit are lawful and
4 appropriate?); Issue 13 (Whether the construction design standards specified in the NPDES
5 Permit for the Erosion and Sediment Control Plan for construction stormwater are lawful and
6 appropriate?); and Issue 14 (Whether the NPDES Permit contains minor errors, including
7 typographical mistakes, technical and compliance date inconsistencies that should be
8 corrected?).

9 1. In Part I, Condition S4.A, change the date in the third paragraph so it reads as
10 follows:

11 “Effluent characterization report shall be submitted to Department for review and
12 approval on March 1, 2005.”

13 2. In Part I, Condition S4.A, delete the last paragraph regarding the Pacific oyster
14 and mussel test protocols.

15 3. In Part I, Condition S7.A, the table should be changed to read as follows:

Daily Peak Flow @ Maximum Overflow Rate of 4.1 GPM/SF of Dissolved Air Flotation Surface Area	7.1 MGD
IWTP Hydraulic Capacity	8.3 MGD

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19 4. In Part I, Condition S10, the milestone date for Design Completion should be
20 changed to July 1, 2005.

21 5. In Part II, Introduction, delete the requirement to collect samples prior to
22 mixing with any other flow, so the fourth sentence of the paragraph reads as follows:

23 “Samples shall be collected immediately after applicable BMP(s).”

24 6. In Part II, Condition S1.A, amend the first sentence of the first paragraph so
25 that it reads as follows:

26
27

1 “Beginning on the effective date of this permit and lasting through the expiration date,
 2 the Permittee is authorized to discharge stormwater associated with industrial activity
 3 to waters of the state, and shall monitor all discharges at the permitted outfall locations
 4 as authorized by this permit.”

5 7. In Part II, Condition S1.A, Table 1, change the Parameter “Turbidity-NTU” to
 6 “TSS-mg/L” and the Sampling Type from “Grab” to “Flow Weighted Composite” so the table
 7 reads as follows:

CATEGORY	PARAMETERS	DAILY MAXIMUM LIMITS	SAMPLING FREQUENCY ¹	SAMPLING TYPE
Runoff	Flow-MG ² /Event	Report	Once/Month	Continuous/ Estimate
Runoff	TSS-mg/L	100 mg/L	Once/Month	Flow Weighted Composite ⁴
Runoff	pH-S.U.	Between 6.5- 8.5 S.U.	Once/Month	Grab
Runoff	Oil and Grease mg/L ³	15 mg/L-No visible sheen	Once/Month	Grab
Runoff	BOD ₅ -mg/L	Monitor and Report	Once/Month	Flow Weighted Composite ⁴
Runoff	Total Glycol- mg/L ⁵	Report-mg/L	Once/Month	Flow Weighted Composite ⁴
Runoff ⁶	Ammonia-mg/L	19 mg/L	Once/Month	Flow Weighted Composite ⁴
Runoff ⁶	Nitrate/Nitrite as N-mg/L	0.68 mg/L	Once/Month	Flow Weighted Composite ⁴
Runoff	Total Copper-mg/L	63.6 µg/L	Once/Month	Flow Weighted Composite ⁴
Runoff	Total Lead-mg/L	81.6 µg/L	Once/Month	Flow Weighted Composite ⁴
Runoff	Total Zinc-mg/L	117 µg/L	Once/Month	Flow Weighted Composite ⁴
Runoff	Priority Pollutants ⁷	Report	2/year	Flow Weighted Composite ⁴

¹ The sampling frequency shall continue throughout the term of this permit. If the

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 STIPULATION BETWEEN ECOLOGY AND PORT
 REGARDING ISSUES 1, 5, 11 13 AND 14
 PAGE 3

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1	Permittee demonstrates total compliance at the point of discharge with the final effluent limit parameters, as prescribed under Table 1, for one full year, the monitoring frequency for that particular outfall may be reduced to once per quarter upon a written request from the Permittee. The Permittee shall return to original monitoring should an outfall fail to maintain total compliance in two consecutive quarters.
2	
3	
4	² The Permittee shall estimate the flow if continuous flow measurement is not feasible.
5	³ Oil & grease shall be measured by Ecology Method NWTPH-DX.
6	⁴ Sampling shall be performed in accordance with the latest approved monitoring plan.
7	⁵ Total Glycol is the sum of Ethylene and Propylene Glycol. Monitoring shall be during deicing and anti-icing months.
8	⁶ Required only if urea is applied. If Urea is not applied, Permittee must certify it.
9	⁷ See Fact Sheet Appendix I for the list of priority pollutant chemicals. Samples shall be taken twice per year, once during wet season and once during dry season in year three (3) and the report shall be submitted to the Department one hundred and eighty (180) days prior to permit expiration in conjunction with permit application.

8. In Part II, Condition S1.B, delete the phrase “to the receiving water” in the first sentence of the first paragraph so it reads as follows:

“Beginning effective date of issuance of this permit and lasting through the expiration date, the Permittee shall conduct regular monitoring of authorized outfalls as described below for discharge of stormwater.”

9. In Part II, Condition S1.B, Table 2, change the Parameter “Turbidity-NTU” to “TSS-mg/L” and the Sampling Type from “Grab” to “Flow Weighted Composite,” and renumber the last footnote as “5” and apply footnote 5 to the parameter Ammonia, so the table reads as follows:

CATEGORY	PARAMETERS	DAILY MAXIMUM	SAMPLING FREQUENCY ¹	SAMPLING TYPE
Runoff	Flow-MG ² /Event	Report	Once/Month	Continuous/ Estimate
Runoff	TSS-mg/L	Report	Once/Month	Flow Weighted Composite
Runoff	pH-S.U.	Report	Once/Month	Grab
Runoff	Oil and Grease mg/L	Report	Once/Month	Grab
Runoff	BOD ₅ -mg/L	Report	Once/Month	Flow Weighted Composite ³

STIPULATION BETWEEN ECOLOGY AND PORT
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1	Runoff	Total Glycol- mg/L ⁴	Report	Once/Month	Flow Weighted Composite ³
2					
3	Runoff ⁵	Ammonia-mg/L	Report	Once/Month	Flow Weighted Composite ³
4					
5	Runoff ⁵	Nitrate/Nitrite as N-mg/L	Report	Once/Month	Flow Weighted Composite ³
6					
7	Runoff	Total Copper-mg/L	Report	Once/Month	Flow Weighted Composite ³
8					
9	Runoff	Total Lead-mg/L	Report	Once/Month	Flow Weighted Composite ³
10					
11	Runoff	Total Zinc-mg/L	Report	Once/Month	Flow Weighted Composite ³
12					
13	Runoff	Total Hardness- Reported as CaCO3	Report	Once/Month	Flow Weighted Composite ³
14	¹ The sampling frequency shall continue throughout the term of this permit. If the Permittee demonstrates total compliance at the point of discharge with the final effluent limit parameters, as prescribed under Table 2, for one full year, the monitoring frequency for that particular outfall may be reduced to once per quarter upon a written request from the Permittee. The Permittee shall return to original monitoring should an outfall fail to maintain total compliance in two consecutive quarters.				
15	² The Permittee shall estimate the flow if continuous flow measurement is not feasible.				
16	³ Sampling shall be performed in accordance with the latest approved monitoring plan.				
17	⁴ Total Glycol is the sum of Ethylene and Propylene Glycol. Monitoring shall be during deicing and anti-icing months.				
18	⁵ Required only if urea is applied. If Urea is not applied, Permittee must certify it.				

10. In Part II, Condition S1, add a new section H to read as follows:

“H. Instream Turbidity Sampling.

The Port shall monitor for turbidity in-stream at points upstream and downstream of each outfall listed in Tables 1 and 2 of this Condition S1. The frequency of turbidity monitoring shall be once/month. The location of each upstream and downstream

1 sampling point shall be determined in a sampling and monitoring plan to be developed
2 by the Port and submitted to Ecology for review and approval.”

3 11. Ecology acknowledges that the Port intends to conduct a reasonable potential
4 analysis for the outfalls and parameters listed in Part II, Condition S1, and that the Port
5 intends to submit the results of that analysis and other site-specific information to Ecology for
6 future consideration.

7 12. If the Port prevails on Issue 12 (Whether it is lawful for the NPDES Permit to
8 apply effluent limits to stormwater that discharges to the Northwest Ponds?), then Ecology
9 and the Port agree that Part II, Condition S1.A, Table 1 should be modified so that numeric
10 effluent limits apply to discharges from Northwest Ponds, rather than discharges to Northwest
11 Ponds. This modification would be made by deleting all outfalls listed in Table 1 that
12 discharge to Northwest Ponds and substituting the following:

13

OUTFALL #	OUTFALL LOCATIONS	SAMPLING POINT	RECEIVING WATER
NW Pond Outlet	Latitude: 47° 25' 45" N Longitude: 122° 18' 45" W	At the point of discharge	Des Moines Creek (west branch)

16 13. In Part II, Condition S2.A, change the day of the month on which DMR forms
17 must be received, so the third sentence of the first paragraph reads as follows:

18 “DMR forms shall be received no later than the 30th day of the month following the
19 completed monitoring period, unless otherwise specified in this permit.”

20 14. In Part II, Condition S5.B(3)(vi), change the condition referenced in the first
21 sentence of the paragraph so the sentence reads as follows: “The SWPPP will include a
22 BMP(s) to identify plant personnel who will inspect designated equipment and plant areas as
23 required in Condition S1.D of Part II of this permit.”

24 15. In Part II, Condition S6, change the amount of rain described in the second
25 sentence of the first paragraph so the sentence reads as follows: “The sampling events must
26 occur during storms with at least 0.1 inches of rain in a 24-hour period.”

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STIPULATION BETWEEN ECOLOGY AND PORT
REGARDING ISSUES 1, 5, 11 13 AND 14
PAGE 6

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1 16. In Part II, Condition S6, change the sentence immediately before the table on
2 page 54 to read as follows: “Following locations shall be sampled.”

3 17. In Part II, Condition S8, change the date for collecting samples so the second
4 sentence of the third paragraph reads as follows: “The first sample shall be taken no later than
5 May 1, 2004.”

6 18. In Part III, Condition S1.A.1, correct a typographical error in the paragraph
7 following Table 1 so the second sentence reads as follows: “Walker Creek outfall boundaries
8 extend from wetlands headwaters east of Des Moines Memorial Drive to Des Moines
9 Memorial Drive.”

10 19. In Part III, Condition S1.B, Table 3, delete the requirements in footnote “a” to
11 collect samples within the first hour of discharge, and to collect samples only after 24 hours of
12 no discharge, so the second sentence of the footnote reads as follows: “For nonchemically
13 treated stormwater, the monitoring frequency shall be: a) all samples shall be taken at the
14 sampling point specified in the permit or, in case of in-stream sampling, at the point of
15 complete mix determined by the Permittee; and b) the storm event sampled must be at least
16 0.5 inches of rain in a 24-hour period; and c) samples must be representative of discharge.”

17 20. In Part III, Condition S1.B, Table 3, change the requirements applicable to
18 sampling frequency for Total Petroleum Hydrocarbons so the fifth column of the table reads
19 as follows: “One/batch for chemical treatment. See footnote^a for the rest.”

20 21. In Part III, Condition S5.B(1)(b)(iv), change the requirement in the second
21 sentence regarding the existing condition peak runoff rate so the sentence reads as follows:
22 “The peak flow of stormwater runoff shall be controlled as specified by the *Stormwater*
23 *Management Manual for Western Washington*.”

24 22. The Port agrees to withdraw Issues 1, 5, 11, 13 and 14.


25 23. This Stipulation sets forth modifications to certain provisions of the Permit that
26 the Port has challenged under Issues 1, 5, 11, 13 and 14. By entering into this Stipulation, the
27

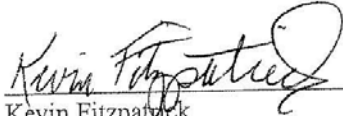
1 Port does not waive its right to challenge these or other provisions of the Permit on the basis
2 of any other Issue listed in the Prehearing Order.

3 DATED this 16th day of July, 2004.

4 For PORT OF SEATTLE:

For DEPARTMENT OF ECOLOGY:

5 
6 Bob Duffner
7 Bob Duffner
8 Water Resources Manager
9 Seattle-Tacoma International Airport


Kevin Fitzpatrick
Water Quality Section Manager
Northwest Regional Office

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