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POLLUTION CONTROL HEARINGS BOARD
FOR THE STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION,)
Appellant,)
v.)
STATE OF WASHINGTON,)
DEPARTMENT OF ECOLOGY; and)
THE PORT OF SEATTLE,)
Respondents.)

No. 01-160

DECLARATION OF ANDREA GRAD
IN SUPPORT OF ACC'S MOTION TO
SUPPLEMENT THE RECORD ON ITS
MOTION FOR STAY

(Section 401 Certification No.
1996-4-02325 and CZMA concurrency
statement, Issued August 10, 2001,
Reissued September 21, 2001, under No.
1996-4-02325 (Amended-1))

Andrea Grad declares as follows:

1. I am over the age of 18, am competent to testify, and have personal knowledge of the facts stated herein.

2. I am a paralegal with the law firm of Helsell Fetterman LLP, which represents the Airport Communities Coalition in this matter.

3. On November 5, 2001, I submitted a routine Public Disclosure Act request to the Department of Ecology's Northwest Regional Office. On November 7, 2001, I received from

Sarah Wright at Ecology's NWRO several short documents, via fax. I was out of the office on
DECLARATION OF ANDREA GRAD IN SUPPORT OF ACC'S OPPOSITION TO ECOLOGY'S MOTION TO STRIKE - 1

HELSELL FETTERMAN LLP
1500 Puget Sound Plaza
1325 Fourth Avenue
Seattle, WA 98101-2509

Rachael Paschal Osborn
Attorney at Law
2421 West Mission Avenue
Spokane, WA 99201

ORIGINAL

AR 006114

1 Friday, November 9, 2001, and Monday, November 12, 2001. On Friday, November 9,
2 Ecology's NWRO made available to us some 651 pages of PDA documents, and another Helsell
3 Fetterman paralegal had these documents picked up by messenger in my absence. On Tuesday,
4 November 13, and ensuing days, I reviewed the new documents.
5

6 4. Attached hereto are true and correct copies of several of the documents we
7 received from Ecology's NWRO on November 7 and November 9, 2001:

8 a. Letter dated October 24, 2001, from Port water resources manager Keith
9 Smith to Ecology 401 permit coordinator Ann Kenny, Re: Low Streamflow Analysis and
10 Summer Low Flow Impact Offset Facility Proposal, Water Quality Certification #1996-4-02325
11 (Amended-1) (Exhibit A);
12

13 b. Email dated October 25, 2001, at 4:55 p.m., from Kelly Whiting to Ann
14 Kenny and Ray Hellwig, Re: Pre Low Flow Meeting Briefing (Exhibit B);

15 c. Email dated October 31, 2001, at 2:43 p.m., from Kelly Whiting to
16 Kathryn Snider, Re: DRAFT Low Flow Analysis Meeting Notes from October 30, 2001,
17 attaching "401 Permit -- Post-Issuance Clarification, Sea-Tac International Airport, Third
18 Runway, Draft Meeting Notes, Low Flow Analysis," dated October 30, 2001, prepared by Kate
19 Snider, Floyd Snider McCarthy, Inc. (Exhibit C); and
20

21 d. Notes on HSPF Modeling of Miller, Walker and Des Moines Creeks,
22 Hydrocomp, Inc., with handwritten notation at top: Norm Crawford: Recommendations to POS,
23 Received: 10/30/01 (Exhibit D).
24

25 DECLARATION OF ANDREA GRAD IN
SUPPORT OF ACC'S OPPOSITION TO
ECOLOGY'S MOTION TO STRIKE - 2


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AR 006115

1 I declare under penalty of perjury under the laws of the State of Washington that the
2 foregoing is true and correct.

3 DATED this 16th day of November, 2001, at Seattle, Washington.

4
5 
6 Andrea Grad

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8 g:\lu\acc\pchb\grad-decl-motnsupp.doc
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25 DECLARATION OF ANDREA GRAD IN
SUPPORT OF ACC'S OPPOSITION TO
ECOLOGY'S MOTION TO STRIKE - 3

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AR 006116

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AR 006117



Port of Seattle

October 24, 2001

Ms. Ann Kenny
Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, WA 98008-5452

RECEIVED
OCT 26 2001
DEPT OF ECOLOGY

RE: Low Streamflow Analysis and Summer Low Flow Impact Offset Facility
Proposal, Water Quality Certification #1996-4-02325 (Amended-1)

Dear Ms. Kenny:

The Port of Seattle is working to finalize the Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal required by the referenced Water Quality Certification for the Seattle-Tacoma International Airport Master Plan Update. In order to meet the 45-day schedule set forth in Section I.1 of the certification, the report needs to be submitted to Ecology on or before November 5, 2001.

While revising the HSPF/Hydrus/Slice models to implement the changes required in section I.1.c.i of the certification, an error was discovered in how the data is transferred between the Slice and HSPF models. Specifically, the HSPF model has a default function that assumes the input is in daily units, and automatically converts the input to hourly units. When the output from the Slice modeling was transferred to HSPF, the modeler manually applied the conversion. Therefore, the conversion was applied twice, and the effect was that the modeled embankment flow was 1/24 of what it should have been. The results of this error are that the impacts to Miller and Walker Creeks were overestimated. The actual impacts to summer low flow will be less than previously thought, and the facilities proposed to offset the impacts can be reduced in size. It is important to note that the error is limited to data handling between the models. The basic modeling approach, the calibration, and the underlying assumptions are still valid and will not be changed as this error is corrected.

In order to assure that the Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal accurately predicts the impacts and proposes appropriate facilities to offset the impacts, we need to re-work the analysis to correct the error. If other errors or inconsistencies in the modeling are detected, we will bring them to your

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October 24, 2001

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attention for possible resolution. This work will require additional time beyond the current submittal date of November 5, 2001. Therefore, pursuant to Section C.4 of the Water Quality Certification, the Port is requesting an extension of the specified submittal deadline for the Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal. We request that the date be extended to November 21, 2001.

Please call me at 206/988-5528 if you would like to discuss this request.

Sincerely,

A handwritten signature in black ink, appearing to read "Keith R. Smith". The signature is fluid and cursive, with the first name "Keith" being the most prominent.

Keith R. Smith
Water Resources Manager

xc: Elizabeth Leavitt, Traci Goodwin, Laurie Havercroft, POS
Paul Fendt, Parametrix
Kate Snider, Floyd Snider McCarthy
Jay Manning, Marten Brown

AR 006119

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AR 006120

Kenny, Ann

From: Whiting, Kelly [Kelly.Whiting@METROK.COV]
Sent: Thursday, October 25, 2001 4:55 PM
To: Kenny, Ann; Hellwig, Raymond
Subject: Pre Low Flow Meeting Briefing

Ann/Ray -

I got the pre-meeting briefing from Joe this AM. This was expected per Kate's latest e-mail message. Here is my take on what was discussed,

Hydrocomp (Norm Crawford) was hired to do an "independent" review. Their general finding was that they didn't like the approach used. For example,

They wanted the impervious area runoff (run-on onto filter strips) to be modeled in HSPF prior to generating input to embankment model. This was my comment. However, I doubt that it was documented in the sketchy facilitated meeting notes. The issue is discussed somewhat in my comments, and was definitely discussed in great detail during the facilitated meetings. Joe had provided information stating that the approach used was conservative, and that the filter strips could handle all of the run-on from the runways with hourly timesteps. Apparently, now when they look at it, 27% of the runoff from the runways is not able to infiltrate into the filter strips. This really sucks in that I raised all these issues, but the Port's consultants were unwilling to do it right, said it didn't matter, and got me to buy into the approach through the facilitated process.

The new runs were done using hourly timesteps. This has same history as above. I requested/expected they do it that way, but instead they ran it using daily timesteps. During review, I asked why and what difference it makes, and the response was that even with hourly timesteps the embankment would effectively handle all flows generated from both pervious and impervious surfaces. I don't understand why when it is analyzed now, there is 27% of the runway runoff that does not infiltrate.

Apparently when the embankment flows were reapplied to HSPF, there was an important "flag" that was left blank. I had reviewed and verified the scale factor used to convert the daily data into hourly data. However, the default for the flag was that HSPF would automatically divide daily data into hourly timesteps. This reportedly resulted in the factor of 24 being applied twice during the re-insertion of the embankment flows. This involves an HSPF default setting that the modeler (and myself) did not know would automatically apply scale factors. All the checks made to verify that mass balance had not been violated were done before HSPF mixed the embankment flows with the other hydrologic flows in the basin. Therefore, all appearances were that mass balance had been preserved. It is difficult to perform the mass balance check after the embankment flows have been added back in with the rest of the basin, which is where the problem reportedly occurred.

The new model was run with a wet up period. This was an issue which came up after the previous modeling work was completed. I support the use of a wet up period, due to the short period of record being used to assess embankment affects. Otherwise, HSPF spends a significant portion of the first year filling up the empty storages.

Hydrocomp indicated that water lost from the embankment toe drain should not be sent to active groundwater, but rather should be sent directly to stream. Reportedly they feel that sending the water lost through the till layer to active groundwater is overly attenuating flows. Currently, I do not buy into this approach. I requested a copy of the Hydrocomp report, but Joe doesn't know if one exists. He is getting his directions via Parametrix. Joe believes that there is a good chance that the impact will turn into a summer low-flow surplus under the revised modeling approach.

Apparently, Walker creek embankment discharges are going to be considered now. Just prior to submitting their current report, the Port chose to not include contributions from the embankment in the Walker Creek model. I assumed the reason for the removal was related to the apparent overestimation of Walker Creek embankment areas. Joe was not sure if the embankment area discrepancies have been resolved. Apparently,

AR 006121

11/6/2001

this determination remains with the embankment model which is being rerun now.

I asked if my comments, and other relevant public comments, are being addressed in the revised work. Joe was not aware of anything being done to address any comments other than those by Hydrocomp. I would expect that the Hydrocomp comments will be provided to us at the meeting, but they probably won't.

I did not raise a lot of questions during this call. I just tried to understand what is being done (revised modeling is already partially complete). They apparently are not looking for our buyoff on their revised approach. I strongly feel that the Port should have had their independent review done before they made their "final" mitigation proposal. I strongly feel that there are important legal questions that need to be answered on reopening impact/mitigation issues after permit issuance. I strongly feel that the Port should be addressing all comments, not just those made by their hired "independent" reviewer. I strongly feel the Port should be prepared to make a presentation as to how all comments received on their current low flow proposal are being addressed in their proposed revised report prior to any formal submittal. These comments may raise additional questions as to how the Port's proposal fits within the ongoing permit process.

Sincerely,

- - Kelly.

Kelly R. Whiting, P.E.
King County Department of Natural Resources
Water and Land Resources Division
Engineering Studies and Standards

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AR 006122

11/6/2001

EXHIBIT C

AR 006123

Kenny, Ann

From: Whiting, Kelly [Kelly.Whiting@METROK.C.GOV]
Sent: Wednesday, October 31, 2001 2:43 PM
To: Kathryn Snider
Cc: Kenny, Ann; Masters, David
Subject: RE: DRAFT Low Flow Analysis Meeting Notes from October 30, 2001

Attached are a few comments and follow-up related to Walker Creek embankment areas. Please contact me if you do not intend to include a suggested edit.

-- Kelly.

-----Original Message-----

From: Cheryl Blaser [mailto:cherylb@fsmseattle.com]
Sent: Wednesday, October 31, 2001 9:54 AM
To: Ann Kenny (E-mail); Kelly R. Whiting (E-mail); David Masters (E-mail); 'lisa.m.scott@NWS.usace.army.mil'; Keith Smith (E-mail); 'kordick.r@portseattle.org'; Paul Fendt (E-mail); Joe Brascher (E-mail); 'kristanovich@fwenc.com'; Charles (Pony) Ellingson (E-mail); Kathryn Snider
Subject: DRAFT Low Flow Analysis Meeting Notes from October 30, 2001

<<Low Flow errors mtg 103001draft.doc>>

All - attached are draft notes from the low flow meeting held yesterday. Please review these notes carefully and contact Kate Snider with any comments to the notes by Tuesday noon, 11/6/01. Kate will then finalize the notes. Kate would like to appeal to Paul, Joe, Pony and Kelly to assist in making the modeling vocabulary more accurate wherever necessary. Thank you

Cheryl Blaser
Floyd Snider McCarthy, Inc.
83 South King Street
Suite 614
Seattle, WA 98104
Voice: 206.292.2078
Fax: 206.682.7867
cherylb@fsmseattle.com

AR 006124

11/6/2001

401 Permit – Post-Issuance Clarification Sea-Tac International Airport, Third Runway

DRAFT MEETING NOTES

LOW FLOW ANALYSIS

October 30, 2001
8:30 – 11:30

These meeting notes have been prepared by Kate Snider, Floyd Snider McCarthy, Inc.

ATTENDEES

Ann Kenny, Dept. of Ecology
Kelly Whiting, King County
David Masters, King County
Lisa Scott, Corps of Engineers
Keith Smith, Port of Seattle
Robin Kordick, Port of Seattle
Paul Fendt, Parametrix
Joe Brascher, Aquaterra
Pony Ellingson, Pacific Groundwater Group
Felix Kristanovich, Foster Wheeler
Kate Snider, Floyd Snider McCarthy

MEETING SCOPE AND AGENDA

Work is underway by the Port of Seattle to revise the Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal per 401 Permit conditions. In the process of preparing the revised document, Port of Seattle consultants identified errors in the low streamflow modeling that require correction in the revised document, and that will affect the conclusions of the low streamflow analysis.

This meeting was called by the Port to allow the Port consulting team to explain the modeling errors and revisions that will be made to correct the errors.

DESCRIPTION OF ERRORS AND ASSOCIATED REVISIONS

1. Conversion factor error in embankment fill input to HSPF:

When output from the embankment modeling was input to HSPF, an error of 1/24th magnitude was made. Conversion of daily output to hourly output was occurring twice – once by the modeler (Joe Brascher, Aquaterra) and once automatically within the HSPF program. This error affects all areas where embankment discharge is input to low streamflow analysis. The error has been corrected in revised modeling which shows the contribution of flow from the embankment fill to low stream flow is now 24 times the previous value.

2. Incorrect input files for embankment modeling:

In the previous modeling, Aquaterra gave Pacific Groundwater Group daily "AGWO" files as input to the embankment modeling. Instead, hourly "AGWI" files should have been provided.

3. Revised approach to modeling of impervious area at embankment filter strips:

The error listed above in #2 has a level of significance that has led the modelers to propose more direct modeling of the impervious area that runs off to filter strips at the top of the embankment. In 401 permit decision-making discussions between the Port, King County and Ecology, several alternatives were discussed for how to model the impervious area tributary to the filter strips. It was decided then that rainfall on the pervious area of the embankment would be "scaled up" to address the impervious area. With the revision in embankment modeling input files to hourly "AGWI" files, more direct modeling of the impervious area and filter strips will be performed by the Ports consulting team.

In this more direct modeling, Aquaterra will give Pacific Groundwater Group the "AGWI" time series data for the pervious embankment, and "SURO" time series data for impervious areas on the embankment, both on a per-acre basis. Pacific Groundwater will calculate the total impervious area and total filter strip area for each basin. Then, both "AGWI" and "SURO" time series data will be added on an hourly basis to compute total water available to the filter strips. Peak flows to the filter strips that are greater than the infiltration capacity of the filter strips will be categorized as surface runoff, and not used in Hydrus. Flows less than the infiltration capacity of the filter strips will be input to Hydrus.

It was noted by King County that all areas included in the embankment model should be removed from the HSPF stream model. ~~in revision to the modeling, it is important to verify the length of embankment modeled.~~ The King County reviewer has questioned the length of the embankment modeled relative to the point on the SMP grading plans where the embankment transitions to on-grade or cut. The length of the embankment question was resolved during post meeting discussions. However, a remaining comment is that approximately 8 acres of the Walker Creek embankment (approximately 16 acres total) appears to be included in both the Hydrus embankment model and the HSPF stream model. The Port's consultants will further investigate this remaining comment.

4. Use of "1-d" version of Hydrus:

The revised approach for modeling of filter strips listed above in #3 requires Pacific Groundwater Group to use a 1-dimensional version of the Hydrus model, rather than the 2-d version of the model used previously. The 2-d version of the model used previously is not able to handle variability of wetness and saturated conditions associated with the revised input files described above.

5. Modeling of discharge from infiltration basins:

The revised approach to the embankment modeling listed above in #3 results in a more significant surface water runoff component from the embankment. To model more closely the full water balance, revised low streamflow analysis modeling will now model and document water infiltrated from the infiltration basins that receive surface water runoff in the Miller Creek basin. A time series of embankment surface water runoff will be provided by Pacific Groundwater Group to Aquaterra for this work. The water

infiltrating from the infiltration basins will be routed to the groundwater component of HSPF modeling. Water infiltrating from the infiltration basins was ignored in previous modeling, because surface water runoff from the embankment was negligible in previous modeling.

6. Predeveloped Conditions for SDS-5,6&7 in DesMoines Creek Basin:

In previous modeling, all groundwater from pervious areas in SDS-5,6 & 7 in the 1994 pre-developed conditions was inaccurately routed to DesMoines Creek. In reality, groundwater from significant portions of these basins flows to Walker Creek. Post-developed 2006 conditions did not route this groundwater to DesMoines.

For revised modeling, the predeveloped conditions for the DesMoines creek basin will include accurate routing for SDS-5,6 & 7.

QA REVIEW OF LOW FLOW MODELING BY HYDROCOMP

Following discovery of the 1/24th conversion error in HSPF, the Port submitted the entire low flow modeling package to Norm Crawford, of Hydrocomp, for an independent round of review. Dr. Crawford is one of the people who developed the HSPF model. Dr. Crawford prepared a memo documenting his review, including recommendations for revision.

Adjusted approaches listed above as numbers 3, 5 & 6 are consistent with Dr. Crawford's memo.

Additionally, Dr. Crawford made a recommendation that the "seepage to till" output component of embankment modeling be routed directly to the Creek, rather than to "AGWO".

The Port, with concurrence from Ecology and King County at today's meeting, decided not to adopt this recommendation. Approach to handling the "seepage to till" component of embankment modeling will not be changed. The rationale for this decision is that:

- There is no clear error or problem in the previous modeling that requires correction.
- Any approach has associated potential modeling uncertainty. The approach used by the Port team to date is conceptually sound and does not need to be changed.
- There is no clear reason to route groundwater directly to the stream.

MEETING CONCLUSIONS

- The revisions to the low streamflow analysis described in these meeting notes will be made to correct errors in the previous modeling.
- All revisions required by 401 permit conditions and these additional revisions will be included in the revised Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal, meeting the requirements defined by the 401 permit.
- Very clear documentation and rationale for all changes must be included in the revised deliverable to Ecology, with appropriate and thorough backup. The acceptability of revised

modeling will be based on Ecology review of the final Low Streamflow Analysis and Summer Low Flow Impact Offset Facility Proposal.

- Ecology is separately considering a request from the Port for extension of the schedule for submittal of this 401 permit deliverable.

AR 006128

From: Whiting, Kelly
Sent: Wednesday, October 31, 2001 11:46 AM
To: Paul Fendt (E-mail); Joe Brascher (E-mail)
Cc: Masters, David; Ann Kenny (E-mail); Keith Smith - POS (E-mail)
Subject: Correction/Resolution of County Review Comment
TO: Paul Fendt, Joe Brascher
CC: David Masters, Ann Kenny, Keith Smith

RE: Review Comment concerning size of Walker Creek Embankment

This e-mail is in response to a question raised yesterday concerning one of my review comments. The comment tried to compare the embankment footprint to the SMP grading and conveyance plans. The reason for the comparison was that only 8 acres of embankment was removed from the HSPF model but 16 acres of embankment was simulated in the embankment model. There is still an inconsistency in the handling of basin areas that remains unresolved. However, the comment's conclusion that the embankment footprint included cut areas was incorrect. When I did the review, I had used the scale indicated on the grading plans when actually the plan sheets had been reduced by 50%. It was a coincidence that along the 3rd runway, measured from the Walker/Miller basin divide, that the length of the embankment is 50% of the distance to the end of the runway. And it is coincidence that there is a 40' cut near the end of the runway that is located (proportional to the length of the runway) in the same location as a 40 foot fill area near the southern end of the embankment (proportional to the length of the embankment). It would be very helpful if the map showing the embankment footprint included surface and groundwater basin lines.

Comment Resolution:

1. The Walker Creek embankment area needs to be fully removed from the HSPF models. The amount not yet removed is equal to the difference between the acres modeled in the Hydrus/Slice and the acres removed from the HSPF Walker Creek surface water basin. If this area is located in the non-contiguous groundwater area, the corresponding acres need to be removed from the Walker creek model. If any portion of the simulated embankment is located within the Des Moines Creek groundwater basin, then those acres need to be removed from the Des Moines Creek model.

-- Kelly.

Kelly R. Whiting, P.E.
King County Department of Natural Resources
Water and Land Resources Division
Engineering Studies and Standards

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AR 006129

AR 006130

EXHIBIT D

AR 006131

Norm Crawford: Recommendations
to POS

Received:
10/30/01

Notes on HSPF Modeling of Miller, Walker and Des Moines Creeks:

Linkages between HSPF and Hydrus/Slice

The land surface surrounding the new runways and taxiways at Seatac is modeled as outwash grass, a type of pervious land segment (PERLAND). The active runoff flowpaths for outwash grass are surface runoff and groundwater; interflow is not modeled. Surface runoff is small and has previously been neglected. The only significant active flowpath is groundwater.

The impervious surfaces of the new runways and taxiways can be modeled as an HSPF impervious land segment (IMPLAND). Surface runoff from the runways and taxiways flows into swales where infiltration into the fill will occur. This infiltration can be added to the percolation below the root zone (AGWI) found by modeling the land surrounding the new runways and taxiways as outwash grass with a DEEPR parameter of zero. Any surface runoff from the pervious land should be accounted for and sent to the proper flowpath.

Percolation from the pervious land below the root zone and infiltration of surface runoff from the impervious land are input to Hydrus. This inflow to Hydrus accounts for actual evapotranspiration from the pervious land and actual evaporation from impervious surfaces. The Hydrus inflows move vertically and are attenuated and delayed by amounts approximately proportional to the depth of the fill before it reaches a cell in the Slice model.

The Slice model handles lateral flow toward the toe of the new fill in the drain layer and in the soils that overlie the Vashon till, and calculates flux through the Vashon till into underlying Vashon advance soils. The Slice model includes an assumption in each cell for the elevation of the water table relative to the Vashon till layer. The water table in a cell may be;

- (i) above the surface of the Vashon till.
- (ii) below the Vashon till
- (iii) within the Vashon till

If the water table is above the surface of the Vashon till, no seepage occurs through the till — there is no hydraulic gradient across the till. If the water surface is below the Vashon till, seepage through the till is proportional to the hydraulic gradient across the till, which will include any water depth in the soils or drain layer above the till. If the water surface is within the Vashon till seepage through the till calculated as in (ii) but is reduced by one-half.

The water table elevation in each Slice model cell is fixed, invariant in time.

AR 006132

The following are a summary of recommendations for additional runs of HSPF and Hydrus/Slice. Most of these recommendations have been discussed with the modelers who are doing the runs.

- 1) Calculate the runoff (SURO) from the impervious surfaces within the new fill areas with an HSPF IMPLAND segment. This will properly account for surface retention and actual evaporation from the runways/taxiways.
- 2) Calculate the infiltration (AGWI) into the pervious areas surrounding the new runways and taxiways with an HSPF PERLAND segment for outwash grass with a DEEPFR parameter of zero.
- 3) Use the combined impervious surface runoff (1) and pervious active groundwater inflow (2) to represent the percolation below the root zone. This is the input to Hydrus.
- 4) Account for any surface runoff (SURO) from the outwash grass PERLAND segment. This surface runoff may be small but its fate should be included for completeness.

(steps 5 and 6 are identical to prior model runs)

- 5) Hydrus moves water vertically into the Slice cells, delaying and attenuating the AGWI flux and infiltrating runoff from impervious surfaces.
- 6) Slice moves water laterally to the toe of the fill (or to the last active cell that is down gradient) as 'groundwater outflow' to a stream, and moves water across the Vashon till as 'till seepage' where the hydraulic gradient across the till allows.

(steps 7 and 8 differ from prior model runs)

- 7) Reduce the till seepage by 0.33 (multiply by 0.67) to account for inactive groundwater recharge (DEEPFR).
- 8) Sum the groundwater outflow and the reduced till seepage. Return this combined flow to the stream without additional routing (INFLOW IVOL).

In step 7), any losses to inactive groundwater must occur at depth in the Vashon advance formation. It is reasonable to believe that the fraction of inflow to the Vashon advance formation that is lost to inactive groundwater will be the same after construction of the fill as that found prior to construction of the fill.

In step 8), a choice must be made for handling flows that will return to stream channels. Till seepage in the Slice model is not delivered to the toe of the fill, but occurs along the cross-section. It can be argued that attenuation of till seepage will occur as water is moving toward the toe of the fill. A groundwater element for outwash grass with the calibrated recession constant was used in prior runs to attenuate till seepage.

There are two contrary arguments to this approach. First, if attenuation is occurring in the Vashon advance formation then the water table elevation in this formation would be time variable. The fixed water table elevations used in the Slice model to calculate till seepage

AR 006133

and groundwater outflow above the till would be incorrect. Second, the fill cross-section is man-made. Flowpaths in the fill are very different than the flowpaths calibrated in HSPF. There is no basis for assuming that a calibrated recession rate for active groundwater outflow from outwash grass is applicable to the groundwater flowpath within the Vashon advance formation.

Time delay and attenuation in the fill is calculated by Hydrus. When the Hydrus outflows are used in the Slice model, the presence of the drain layer limits the hydraulic gradient across the Vashon till and further attenuates the flow entering the Vashon advance formation. Adding still more attenuation through HSPF groundwater storage in the Vashon advance formation will not greatly change the timing of groundwater outflow from this formation to streams.

Given the Slice model assumption of a fixed water table in the Vashon advance formation, it is more reasonable to move water to the toe of the fill without further attenuation, i.e. return the till seepage direct to the stream.

Additional Issues

- 9) The pervious land areas given in the Miller/Walker Creek Master Area Table master tables do not correspond with the areas in the HSPF input files for the 1994 condition at Miller and Walker Creeks and for the future scenario at Walker Creek. There are no 1994 calibration values in this spreadsheet. These differences should be reconciled.
- 10) The Hydrus/Slice model calculates runoff from an area of 128 acres (Miller 111.67 acres, Walker 16.33 acres). An area of 124.27 acres was removed from HSPF (116.22 acres Miller, 8.05 acres Walker). Even if the distribution of the areas between Walker and Miller is different due to the different future and 1994 basin boundaries, the total area should be equal.
- 11) Future base flows from the SDW1A infiltration (Reach 47, 2nd outlet) and SDW1B flow splitter (Reach 47, 2nd outlet) are lost in the HSPF model. These flows should be re-infiltrated to a pervious land segment as active groundwater inflow and returned to the creek. The input file should be changed to include these flows.

All other HSPF setups have checked out. Tracey is currently checking the full water balance in Des Moines and expects to finish this task by Oct 3rd.

Norm Crawford

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POLLUTION CONTROL HEARINGS BOARD
FOR THE STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION,)	
)	No. 01-160
Appellant,)	
)	CERTIFICATE OF SERVICE
v.)	
)	
STATE OF WASHINGTON,)	(Section 401 Certification No.
DEPARTMENT OF ECOLOGY; and)	1996-4-02325 and CZMA concurrency
THE PORT OF SEATTLE,)	statement, issued August 10, 2001,
)	Reissued September 21, 2001, under No.
Respondents.)	1996-4-02325 (Amended-1))
_____)	

I, Andrea Grad, an employee of Helsell Fetterman LLP, attorneys for the Airport
Communities Coalition, certify that:

I am now, and at all times herein mentioned was, a citizen of the United States, a resident of
the State of Washington, and over the age of eighteen years.

On November 16, 2001, I caused to be sent via facsimile and via U.S. Mail, First Class, a
true and correct copy of ACC's Motion to Supplement the Record on Its Motion for Stay, and the
Declaration of Andrea Grad in Support of ACC's Motion to Supplement the Record on Its Motion
for Stay, with attachments, in the above-captioned case to:

CERTIFICATE OF SERVICE - 1

HELSELL FETTERMAN LLP
1500 Puget Sound Plaza
1325 Fourth Avenue
Seattle, WA 98101-2509

Rachael Paschal Osborn
Attorney at Law
2421 West Mission Avenue
Spokane, WA 99201

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Joan M. Marchioro
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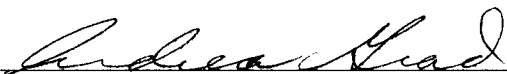
Linda J. Strout, General Counsel
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Gillis E. Reavis
Marten & Brown LLP
1191 Second Avenue, Suite 2200
Seattle, WA 98101

10 I certify under penalty of perjury under the laws of the State of Washington that the
11 foregoing is true and correct.

12 DATED this 16th day of November, 2001, at Seattle, Washington.

13
14 
15 _____
16 Andrea Grad

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g:\lu\acc\pchb\certserv-111601.doc

CERTIFICATE OF SERVICE - 2

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AR 006136