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POLLUTION CONTROL HEARINGS BOARD  
FOR THE STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION,	)	
	)	No. 01-160
Appellant,	)	
	)	DECLARATION OF MICHAEL P.
v.	)	WITEK IN SUPPORT OF
	)	APPELLANTS' MOTION IN LIMINE
STATE OF WASHINGTON,	)	
DEPARTMENT OF ECOLOGY; and	)	(Section 401 Certification No.
THE PORT OF SEATTLE,	)	1996-4-02325 and CZMA concurrency
	)	statement, Issued August 10, 2001,
Respondents.	)	Reissued September 21, 2001, under No.
_____	)	1996-4-02325 (Amended-1))

Michael P. Witek 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. Attached to my declaration as Exhibit A is a list of untimely plans and reports offered by the Port and Ecology that we have identified on a preliminary review of the Exhibit List, which was only finalized on March 11, 2002.
3. Attached to my declaration as Exhibit B are true and correct copies of pages 9-29 of the transcript from the October 15, 2001 pre-hearing conference.

DECLARATION OF MICHAEL P. WITEK IN  
SUPPORT OF APPELLANTS' MOTION IN  
LIMINE - 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 002552

1 4. Attached to my declaration as Exhibit C is an email from Port Counsel to ACC  
2 counsel, sent at 6:02 p.m. on February 15, 2002, and a copy of the attached report: "Third  
3 Runway and Embankment Fill Water Quality and Transport Analysis."

4 5. Attached to my declaration as Exhibit D are true and correct copies of transcript  
5 pages 19 and 20 from the February 12, 2002, deposition of Michael Riley.

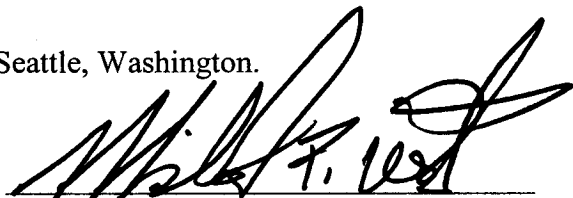
6 6. Attached to my declaration as Exhibit E is a true and correct copy of a January 21,  
7 2002 "Technical Memorandum" with supplemental information regarding wetlands prepared by  
8 James Kelly of Parametrix, submitted to the Army Corps of Engineers ("Corps") on January 25,  
9 2002.

10 7. On February 15, 2002, Andrea Grad of our office sent a Freedom of Information  
11 Act request to the Army Corps of Engineers requesting documents regarding the Port's proposed  
12 Third Runway Project. In response, on March 7, 2002, our office received, among other things,  
13 the Parametrix report that is attached to my declaration as exhibit E.

14 8. Attached as Exhibit F is a true and correct copy of the Port's November 15, 2001,  
15 letter to the PCHB re Plans and Reports Prepared Pursuant to §401 Certification.

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

18 DATED this 12<sup>th</sup> day of March, 2002, at Seattle, Washington.

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25  
  
Michael P. Witek

DECLARATION OF MICHAEL P. WITEK IN  
SUPPORT OF APPELLANTS' MOTION IN  
LIMINE - 2

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

**AR 002553**



**Exhibit A**  
**Preliminary List of Untimely Plans and Reports**

	<b>Exhibit Number</b>	<b>Description</b>	<b>Offering Party</b>
<b>1.</b>	<b>1026</b>	<b>Standard CSF and Soybean Hull Media have been Selected for Onsite Stormwater Treatment BMP testing at the Seattle-Tacoma International Airport. Paper to appear at conference proceedings at Watershed 2002 conference.</b>	<b>Port</b>
<b>2.</b>	<b>1300</b>	<b>Tobiason, S. and L. Logan Trickle Down Effect: Results of Whole Effluent Toxicity Testing and Source Tracing. Industrial Wastewater 2001 (Nov. 2001)</b>	<b>Port</b>
<b>3.</b>	<b>1303</b>	<b>Parametrix Memorandum on Des Moines Way Nursery Wetland Mitigation Restoration Plan (Nov. 2001)</b>	<b>Port</b>
<b>4.</b>	<b>1310</b>	<b>Hart Crowser Memorandum: Hydrologic Conditions and Wetland Hydrology (12/12/01)</b>	<b>Port</b>
<b>5.</b>	<b>1311</b>	<b>Hart Crowser Memorandum: Effect of Shear Modulus on Deformations and Reinforcing Stresses of MSE Walls, Third Runway Project (12/20/01)</b>	<b>Port</b>
<b>6.</b>	<b>1312</b>	<b>Hart Crowser Memorandum: Stability Review of RECo 30% Design, Sea-Tac Third Runway Embankment Project (1/09/02)</b>	<b>Port</b>
<b>7.</b>	<b>1314</b>	<b>Hart Crowser Memorandum: Geotechnical Input to MSE Wall Design, Third Runway Embankment (1/11/02)</b>	<b>Port</b>
<b>8.</b>	<b>1315</b>	<b>Port of Seattle Site Specific Assessment data at Seattle-Tacoma International Airport (1/18/02)</b>	<b>Port</b>
<b>9.</b>	<b>1319</b>	<b>Port of Seattle SSA[SASA?] Study Baseflow Sample Results, SSA Study Stormflow Sample Results and SSA QC</b>	<b>Port</b>



**EXHIBIT**

**AR 002557**

**EXHIBIT**

**AR 002557**

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BEFORE THE POLLUTION CONTROL HEARINGS BOARD

STATE OF WASHINGTON

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AIRPORT COMMUNITIES COALITION, )  
 )  
 Appellants, )  
 )  
 vs. ) PCHB No. 01-133  
 )  
 DEPARTMENT OF ECOLOGY and )  
 THE PORT OF SEATTLE, )  
 )  
 Respondents. )  
 )

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PREHEARING CONFERENCE

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October 15, 2001  
 Lacey, Washington

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Randi R. Hamilton, CCR  
 Certified Court Reporter  
 CCR No. HAMILRR470D6  
 GENE BARKER & ASSOCIATES, INC.  
 406 Security Building  
 Olympia, Washington 98501  
 (360) 943-2693

1 BE IT REMEMBERED that a prehearing conference was  
2 held in the above-entitled matter at the Environmental  
3 Hearings Office, 4224 Sixth Avenue Southeast, Building  
4 No. 2, Lacey, Washington, on October 15, 2001.

5 This matter came on before the State Pollution  
6 Control Hearings Board, Board Member KALEEN COTTINGHAM,  
7 Presiding.

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A P P E A R A N C E S

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14 For the Appellants:

KEVIN L. STOCK  
PETER J. EGLICK  
MICHAEL P. WITEK  
Attorneys at Law  
HELSELL FETTERMAN  
1500 Puget Sound Plaza  
1325 Fourth Avenue  
Seattle, Washington 98104

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20

RACHAEL PASCHAL OSBORN  
Attorney at Law  
2421 West Mission Avenue  
Spokane, Washington 99201

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22

23

24

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For the Respondent DOE:

THOMAS J. YOUNG  
JOAN MARCHIORO  
Assistant Attorneys General  
Department of Ecology  
P.O. Box 40117  
Olympia, Washington 98504

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A P P E A R A N C E S (Continued)

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For the Respondent Port  
of Seattle:

ROGER A. PEARCE  
STEVEN G. JONES  
Attorneys at Law  
FOSTER PEPPER & SHEFELMAN  
1111 3rd Avenue, Suite 3400  
Seattle, Washington 98101

GILLIS E. REAVIS  
Attorney at Law  
MARTEN BROWN  
1191 2nd Avenue, Suite 2200  
Seattle, Washington 98101

TRACI GOODWIN  
Senior Port Counsel  
Port of Seattle  
2711 Alaskan Way (Pier 69)  
Seattle, Washington 98111

1 are off by a week or two, and I think through  
2 discussion here we'll be able to agree upon those  
3 dates.

4 One critical issue that is important to us  
5 that I don't see in Mr. Reavis's proposed schedule  
6 is a deadline by which Ecology and the Port are  
7 required to submit any plans they are going to rely  
8 upon to argue reasonable assurance at the hearing,  
9 and ACC would propose a cutoff date of November 15  
10 for that purpose. So any plans that the Port is  
11 going to submit to try to establish reasonable  
12 assurance should be submitted by November 15.

13 The reason why that's important is our experts  
14 need time to review any additional material that  
15 Ecology seeks from the Port, and the 401 has  
16 already been issued, so we would ask that the  
17 scheduling order have a cutoff date for that  
18 purpose.

19 MS. COTTINGHAM: Just for the purpose  
20 of using them at the hearing, not for purposes of  
21 complying with their obligations or conditions  
22 under the 401?

23 MR. STOCK: Right. Anything after  
24 that cutoff date of November 15 cannot be relied  
25 upon at the March 18 hearing for purposes of trying

1 to establish reasonable assurance.

2 MS. COTTINGHAM: How does the Port or  
3 Ecology feel about that?

4 MR. PEARCE: Well, it doesn't make a  
5 lot of sense to have a cutoff date for one set of  
6 exhibits and not for other sets of exhibits. I  
7 mean, our experts are also going to have to respond  
8 to the expert reports prepared by ACC's experts. I  
9 think we should have the same date for everyone for  
10 a final witness list. And some of the submittals  
11 in the 401 are actually not required until after  
12 November the 15th, I believe. They're later in  
13 November.

14 So, I mean, that would be a hardship on us.  
15 There's no reason why it shouldn't be the same date  
16 for everyone. I don't think it needs to be as  
17 early as November the 15th for final exhibit lists.

18 MR. STOCK: This points out a very  
19 critical issue in this case. We're not talking  
20 about exhibits in the ordinary course, whether  
21 they're documents previously drafted and written  
22 and disclosed pursuant to a public disclosure  
23 request. What we're asking is that the Board set a  
24 deadline date by which all plans that the Port  
25 plans to submit to Ecology to try to get Ecology to

1 reasonable assurance be done by November 15.

2           Actually, all of those plans should have been  
3 submitted by August 10, when the original 401  
4 certification was issued. There was a rescission  
5 and a reissuance, so the next date was  
6 September 21. What we're asking is, for there to  
7 be a full and fair hearing on whether the 401  
8 certification is based upon reasonable assurance,  
9 that anything submitted after November 15 not be  
10 allowed to be relied upon at the March 18 hearing  
11 for purposes of trying to establish reasonable  
12 assurance.

13           MR. PEARCE: To me, it's an arbitrary  
14 deadline, Your Honor. There's no reason for that.  
15 There's also things completely beyond the Port's  
16 control. One condition, for example, in the 401  
17 says that if the Corps of Engineers requires you to  
18 change the Natural Resources mitigation plan, which  
19 is entirely possible, we have to change that  
20 Natural Resources mitigation plan and submit it to  
21 Ecology.

22           So there are a lot of things that are beyond  
23 our control and may go well past November 15th.

24           MR. REAVIS: And we have sort of a  
25 fundamental problem here, I think. The way the



1 issue is phrased is any documents that we intend to  
2 rely on to get Ecology to reasonable assurance.  
3 Obviously our position is that Ecology has  
4 reasonable assurance. There will be documents that  
5 are submitted in the future, but our position is  
6 that, you know, reasonable assurance has been  
7 reached.

8 For example, you have monitoring reports that  
9 go on periodically, and at the hearing we're going  
10 to want to offer the data perhaps and say, well,  
11 see, actually what Ecology believed to begin with  
12 is actually working after construction has begun;  
13 therefore that is reasonable assurance, the  
14 monitoring plan being part of that.

15 So I don't think there is an arbitrary or a  
16 way to decide what is or is not supportive of  
17 reasonable assurance, and I think it would be very  
18 difficult to try to establish a separate deadline  
19 for that apart from the exhibit deadline.

20 MR. STOCK: Not to perpetuate the  
21 issue, because I'm sure you understand it by now,  
22 but just by way of brief reply, what Mr. Reavis  
23 just says I think illustrates the point very well.  
24 He says that Ecology already has reasonable  
25 assurance. Well, if that is the case, then no

1 document submitted after September 21 should be  
2 used on March 18 for purposes of establishing that  
3 Ecology had reasonable assurance when it issued the  
4 401 certification, and neither the Port's lawyers  
5 nor Ecology's lawyers should have any difficulty  
6 with that position if they truly believe that  
7 Ecology had reasonable assurance on September 21,  
8 when that certification was issued.

9 MS. COTTINGHAM: Now, we're talking  
10 about documents that had due dates in the  
11 certification as part of conditions?

12 MR. PEARCE: I don't know what he's  
13 talking about. There are a lot of documents that  
14 have due dates.

15 MS. MARCHIORO: It's unclear what he's  
16 referring to.

17 MR. STOCK: I don't mean to be  
18 unclear. I want to make sure that on March 18,  
19 when we are confronted with plans, those plans,  
20 that either Ecology or the Port doesn't submit a  
21 plan to this Board dated after either September 21  
22 or November 15, and we can talk about the date, but  
23 doesn't submit a --

24 MS. COTTINGHAM: Let's define plan,  
25 because I heard monitoring reports, which are, I

1 think, different than a plan.

2 MR. REAVIS: Construction drawings,  
3 for example.

4 MR. STOCK: For example, any revision  
5 to the low flow mitigation analysis, the low flow  
6 plan, any revision or additions to the stormwater  
7 management plan or Natural Resources mitigation  
8 plan or any changes to the fill criteria.

9 MS. COTTINGHAM: So let me ask a  
10 question, then. Are there any plans under way to  
11 modify any of those unless, as you mentioned,  
12 required by the Army Corps of Engineers?

13 MS. MARCHIORO: I believe that the 401  
14 requires certain things to be submitted, and  
15 they're based on a time from a point in time going  
16 forward: Within 30 days of the issuance of the  
17 401, "X" will occur.

18 I can't tell you precisely what those -- it's  
19 the taking of the conditions and the clarification  
20 that Ecology asked for in the 401, having those  
21 then be folded into the final document.

22 But I don't know that November 15th becomes  
23 some magical date. It seems to me that if we  
24 followed along what the 401 says, that was what  
25 Ecology required of the Port, and that's what

1 should be followed, as far as when those designs  
2 are provided, as we've always done, we've turned  
3 them right over to the ACC.

4 MR. PEARCE: There are 30-day  
5 deadlines, 45-day deadlines, 60-day deadlines, and  
6 if Ecology asks for other comments, those plans  
7 might even change.

8 I would point out this is a de novo proceeding  
9 to the Board.

10 MS. COTTINGHAM: I'm just trying to  
11 get all this clear. So is your issue so that you  
12 can have the opportunity to have your depositions  
13 cover anything of merit, or is it preparing your  
14 witnesses for the case? If it's the preparation,  
15 there might be a different deadline than if it's  
16 the deposition aspect.

17 MR. STOCK: Well, it's both, but  
18 clearly the deposition aspect also has an impact  
19 upon the dates, because if there is going to  
20 continue to be a moving target all the way up to  
21 March 18, then I think that provides a clear signal  
22 and answer to the Board that there is no reasonable  
23 assurance. There certainly wasn't back on  
24 September 21.

25 ACC's preference is to drop the iron curtain

1 now and to say that nothing after September 21,  
2 when the 401 was issued, should be presented or  
3 considered by the Board for purposes of deciding  
4 whether there was reasonable assurance when the 401  
5 certification was issued.

6 I think that is a matter of common sense and a  
7 clear reading of the Clean Water Act. Ecology had  
8 to have reasonable assurance on September 21, when  
9 it issued that 401 certification. So any document  
10 submitted after that date, even those documents  
11 specified in the certification itself, can't be  
12 relied upon to come to the conclusion that there  
13 was reasonable assurance.

14 MR. EGLICK: I know I said I wouldn't  
15 say anything, but can I say something?

16 MS. COTTINGHAM: Yes.

17 MR. EGLICK: You know, I think the way  
18 the 401 works also is that they get a year, and  
19 then when the year is up, they have to reapply. I  
20 mean, I know that's the way it works, because  
21 that's why they didn't make it last year, they had  
22 to withdraw, because they weren't able to make  
23 their case for 401, so they withdrew it and  
24 reapplied.

25 And that's another reason that I think this

1 can't be the kind of iterative process, especially  
2 because it will make an appeal of the 401 really  
3 hard. I mean, then when do we know that we  
4 actually know what we're appealing?

5 MR. PEARCE: Your Honor, Mr. Eglick is  
6 incorrect. Ecology has a year from the date of the  
7 JARPA notice to make a decision on the 401. The  
8 401 lasts, it doesn't expire after a year.

9 MR. EGLICK: No, that's not my point.  
10 My point is that the application, what you said, is  
11 it's a year from when you apply.

12 MR. PEARCE: That they have to make a  
13 decision.

14 MR. EGLICK: Right.

15 MR. PEARCE: But they made a decision.

16 MR. EGLICK: And if they've made a  
17 decision, I guess what I'm saying, and I apologize  
18 because I've got ibuprofen and cold medication  
19 coursing through my veins, but I think if they've  
20 made a decision, it's not right then that they can  
21 keep on in effect making a decision up until the  
22 day we have an appeal.

23 MR. PEARCE: Well, ACC is arguing that  
24 you ought to change your procedural rules, Your  
25 Honor. This is a de novo proceeding before this

1 Board. New evidence can come in, new testimony can  
2 come in. The question is whether there is  
3 reasonable assurance. If there's any additional  
4 evidence about that that's relevant, the Board  
5 needs to hear it.

6 We're happy to work on an exhibit deadline  
7 that gives their witnesses and our expert witnesses  
8 enough time to get ready for the hearing so we  
9 don't waste your time and waste their time.

10 MS. COTTINGHAM: And what would you  
11 propose is reasonable?

12 MR. PEARCE: We have the 25th of  
13 January for a final exhibit schedule. We can move  
14 that back a few weeks or a couple weeks if the  
15 parties want.

16 MR. STOCK: What Mr. Pearce is arguing  
17 for is that the Board be allowed to consider any  
18 evidence created after September 10 to support a  
19 finding of reasonable assurance on September 10,  
20 and just as a matter of logic, that makes no sense.

21 MR. YOUNG: That's a legal argument.

22 MR. PEARCE: As a matter of  
23 controlling the law, it's not true.

24 MR. YOUNG: I mean, that's a legal  
25 issue that we can put on an issue list.

1 MS. COTTINGHAM: Whether or not the  
2 Board's de novo review is as of a date certain, I  
3 mean, that can be an issue, is what I'm saying.

4 MS. OSBORN: And then there's the  
5 practical question of, I mean, what we're talking  
6 about are the submittals that are listed on the  
7 exhibits. A huge number of plans and reports are  
8 expected to come in post issuance of the 401, and  
9 how do we deal with these in the context of a very  
10 short time frame in which we'll be exchanging  
11 discovery and deposing witnesses, witnesses that  
12 need to be able to review this information and  
13 prepare for it.

14 MR. YOUNG: I think we have an exhibit  
15 date that, you know, this is when our exhibits are  
16 due.

17 MS. OSBORN: Are we going to do  
18 depositions after January 25th; is that what you're  
19 proposing?

20 MS. MARCHIORO: We were talking about  
21 setting a different exhibit exchange date, so I  
22 don't think that's what was stated.

23 MS. OSBORN: What do you propose?

24 MS. MARCHIORO: I don't have a  
25 calendar, but early on in January.



1 MS. COTTINGHAM: So you exchange it  
2 before the cutoff date?

3 MS. MARCHIORO: And then give that  
4 opportunity for any discovery that needs to be done  
5 with respect to those documents to be completed  
6 within a two-week period or so.

7 MR. EGLICK: Well, that's short.

8 MS. OSBORN: We need to be able to  
9 start doing depositions in December.

10 MS. COTTINGHAM: What did you say?

11 MS. MARCHIORO: You can always, as you  
12 do in any case, continue the deposition pending any  
13 additional information.

14 MR. PEARCE: We're happy to do that.  
15 We can continue people's depositions if there's  
16 something else that's going to come in that they  
17 need to address.

18 MS. OSBORN: Given the number of  
19 witnesses, I don't know that that's really a  
20 practical approach. I think that we need to know  
21 what the information is before we start the  
22 depositions.

23 MR. STOCK: And in order to be  
24 reasonable, we proposed a November 15 cutoff date  
25 for that purpose so that any additional plans that

1 the Port is going to submit to Ecology, any  
2 revisions to the existing plans, be provided to  
3 Ecology and ACC by November 15. We've got a  
4 March 18 hearing date, and we've got to get busy  
5 on the discovery, so that is why we chose a  
6 November 15 date for that purpose.

7 MR. REAVIS: It seems to me the first  
8 thing that needs to happen is to have a little  
9 better definition of what plans we're talking  
10 about, because some of them may actually be  
11 completed pursuant to the 401 before that date.

12 But it would be, I think, a bad idea to move  
13 forward with a hard date like that, not knowing  
14 what has to be submitted and what doesn't have to  
15 be submitted; what is a plan, what is a plan that  
16 supports reasonable assurance. Our monitoring data  
17 in the future, our construction drawings, a number  
18 of the other things that are required on an ongoing  
19 basis, are going to be kept out of evidence because  
20 they weren't submitted by November 15th. That  
21 doesn't seem to make any sense.

22 Now, if it is specific documents, Natural  
23 Resources mitigation plan, the WERS, a number of  
24 those other documents that can be identified, then  
25 I think we'd be in a position to talk about when

1 that could be done. But kind of this vague  
2 description with a cutoff date that prevents the  
3 Board from considering relevant evidence at the  
4 time of trial, I don't think would be appropriate  
5 here.

6 MR. STOCK: May I take you up on your  
7 offer to have a brief caucus with Ms. Eglick and  
8 Ms. Osborn?

9 MS. COTTINGHAM: Go ahead.

10 (OFF THE RECORD.)

11 MS. COTTINGHAM: We're going to go  
12 back on the record here.

13 MR. STOCK: November 15 is a  
14 reasonable date for submitting any additional plans  
15 that the Port and Ecology are going to rely upon.

16 A suggestion that plans be submitted and then  
17 experts can be redeposed based upon those  
18 additional plans needlessly increases the cost of  
19 this hearing and also, I think, gives an unfair  
20 advantage to Ecology and the Port because ACC's  
21 experts will have to prepare twice then. That is  
22 why we are asking for a cutoff date of November 15.

23 Obviously, the schedule is dependent somewhat  
24 on what the Board's decision is with respect to the  
25 motion for stay. But right now, looking at it, we

1 think November 15, for purposes of submitting those  
2 additional plans, is reasonable.

3 MS. COTTINGHAM: Having heard all of  
4 the parties, what I'm going to do is set a  
5 tentative date of November 15th, and then I'm going  
6 to allow Ecology and the Port to go and look at the  
7 401 certification to see if there are any plans  
8 that are planned to be released at some point in  
9 time before the hearing date and to make a special  
10 case on those particular plans to have them be  
11 admitted and then to allow the appellants the  
12 opportunity to take further depositions related to  
13 those specific plans.

14 Is that an acceptable approach to having a  
15 tentative date, by having the ability outside of  
16 that, if there are things that are known to be  
17 coming in that you would like to have before the  
18 Board?

19 MR. REAVIS: I guess it depends on the  
20 definition of plan. As I understand what they're  
21 looking for, it's the major deliverables, the  
22 Natural Resources mitigation plan, the low flow  
23 report, there are a number of things that are  
24 specifically identified in the 401 as being due, as  
25 opposed to --

1 MS. COTTINGHAM: I would make a  
2 distinction between a monitoring report or a  
3 periodic report, a difference between that and a  
4 plan that would guide future behavior. Is that  
5 what you're looking at?

6 MR. STOCK: Yes.

7 MR. YOUNG: What about construction  
8 plans?

9 MR. PEARCE: Yeah, those are ongoing.

10 MR. EGLICK: Well, I mean, you know, a  
11 construction plan that's kind of ministerial would  
12 be one thing, but, for example, as we were talking  
13 about on the low flow, I mean, the issue, I mean,  
14 they haven't figured out -- well, that would be a  
15 different kind of plan.

16 MS. OSBORN: We haven't seen a design  
17 plan, for example.

18 MS. COTTINGHAM: So I think I'd like  
19 to pick a date and then to allow the Port and  
20 Ecology by that date, the 15th of November, to  
21 provide to all parties and to the Board a list of  
22 those specific plans that you think would come in,  
23 and I'm not going to say you by March 18th; I think  
24 we have to back it up to, you know, most likely the  
25 1st of February; so anything between November 15th

1 and February 1 that you plan to release and then to  
2 provide adequate time for you to take further  
3 depositions if you choose.

4 MR. PEARCE: We'd suggest another  
5 prehearing conference, and we'd also like to hear  
6 from ACC what plans they're concerned about. We  
7 don't want to have to guess.

8 MS. OSBORN: Look in the 401. I mean,  
9 if you can't determine --

10 MR. PEARCE: Rachael, please. If you  
11 can tell us, we can look to the 401 and tell you  
12 exactly when all of those are coming in.

13 MR. STOCK: I think the guiding  
14 principle should be any plan, report, document,  
15 analysis other than those that are kept in the  
16 normal course of business such as a monitoring  
17 reports that the Port or Ecology plan to rely upon  
18 at the March 18 hearing to try to convince this  
19 Board that there was reasonable assurance on  
20 September 21, and of course this is without  
21 prejudice to ACC's argument that de novo review is  
22 as of September 21.

23 MR. PEARCE: We'll identify all plans  
24 by November 15 and what's likely to come in after  
25 that's called for in the 401, but if Mr. Stock is

1 talking about every document now, that's just  
2 what's going to be subject as to the normal --

3 MS. COTTINGHAM: Discovery cutoff.

4 MR. PEARCE: -- discovery cutoff and  
5 exhibit deadline.

6 MR. YOUNG: For example, I mean, the  
7 fill certifications, for example, are ongoing.  
8 Those are required, you know, when the fill site is  
9 tested. You know, construction plans change, you  
10 know, as issues are identified during the  
11 construction, you know, and some of this project,  
12 as I understand it, is not going to be constructed  
13 for several years.

14 So, you know, it seems like what the ACC is  
15 really talking about is, you know, the stormwater  
16 plan, the low flow mitigation plan, the Natural  
17 Resources mitigation plan. Those things, certain  
18 revisions to those plans, were required by the 401,  
19 and, you know, I assume that that's what they're  
20 referring to.

21 MS. OSBORN: In our notice of appeal  
22 and in the exhibit that we used today, there's  
23 quite a list of different documents that are  
24 required to be submitted as part of the 401. I  
25 mean, we can sit here and go through that list. I

1 don't think that would really be productive.

2 MR. PEARCE: I suggest that we both go  
3 through the list and then talk to each other about  
4 it and see if we can agree on what's what.

5 MR. REAVIS: Then we can take it up on  
6 the 15th.

7 MR. PEARCE: And then we can take it  
8 up on the 15th.

9 MS. COTTINGHAM: Of November?

10 MR. PEARCE: Of November.

11 MS. COTTINGHAM: Here's what I've  
12 written down. And a definition of plans, I think I  
13 heard you then broaden it this last go-round, but I  
14 wrote down --

15 MR. STOCK: That wasn't my intent.

16 MS. COTTINGHAM: Well, you said  
17 reports.

18 MR. STOCK: Well, reports, plans, you  
19 know, low flow mitigation report or whatever it's  
20 called, but it's plans, reports, analyses that are  
21 being submitted to Ecology for purposes of trying  
22 to get to reasonable assurance.

23 MS. COTTINGHAM: But not the routine  
24 monitoring or other reports.

25 MR. STOCK: Correct.



1 MS. COTTINGHAM: Okay.

2 MS. MARCHIORO: And that's confusing,  
3 because if what Ms. Osborn is saying is what's  
4 required by the 401, then if what you're asking for  
5 is required by the 401, with the exception of  
6 monitoring reports, then I think it's a divine set  
7 of documents.

8 It appears that what Mr. Stock is saying is  
9 anything that would be used to create additional  
10 support for reasonable assurance, and that does go  
11 beyond what's required by the 401. There'll be  
12 expert reports and other documents created, and  
13 those should not be required to be provided any  
14 time in advance of the final exhibits as far as  
15 unless we're going to have an expert report  
16 identification date. But I think this is --

17 MS. COTTINGHAM: I would agree with  
18 that. You're looking at the plans and the reports  
19 that are required in the 401?

20 MR. STOCK: I am looking at that. I  
21 am also thinking about the BMG case where, on the  
22 eve of the hearing, the project proponent submitted  
23 additional plans, and ultimately the Board used  
24 that as evidence that there wasn't reasonable  
25 assurance at the time that the 401 was issued.

1 MS. COTTINGHAM: Well, I think if we  
2 do the February 1st, that gives you a  
3 month-and-a-half to do some additional follow-up.

4 MS. OSBORN: For the discovery cutoff  
5 date?

6 MS. COTTINGHAM: We haven't even  
7 gotten to all that; it can be linked up later. So  
8 any plans that Ecology or the Port identify before  
9 November 15th, that they intend to release or rely  
10 upon prior to February 1st, that that's then the  
11 ultimate cutoff point, and that they need to  
12 identify those on or before November 15th, and then  
13 allow you time to depose experts or whoever between  
14 then, and I will set the end for that discovery  
15 period of February 28th just on those newly  
16 identified.

17 So this whole discussion came as a jump-in on  
18 this one.

19 MR. STOCK: Precursor, right. But I  
20 think it's a good segue into discovery cutoff and  
21 when the discovery cutoff should be. Mr. Reavis  
22 had proposed in his proposed scheduling order here,  
23 I see a date of January 18 under paragraph 3A.  
24 When we sat down and talked about it, we thought an  
25 appropriate date would be February 1.

POLLUTION CONTROL HEARINGS BOARD  
FOR THE STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION,	)	
	)	PCHB No. 01-160
Appellant,	)	
	)	<b>ORDER GRANTING APPELLANTS'</b>
v.	)	<b>MOTION IN LIMINE TO EXCLUDE</b>
	)	<b>LATE-PRODUCED PLANS AND</b>
STATE OF WASHINGTON,	)	<b>REPORTS</b>
DEPARTMENT OF ECOLOGY; and	)	
THE PORT OF SEATTLE,	)	<b>(Proposed)</b>
	)	
Respondents.	)	

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Airport Communities Coalition and Citizens Against Sea-Tac Expansion (“Appellants”) having filed a motion to exclude evidence in this matter; the Board, having reviewed the memoranda filed in favor of and in opposition to the motion, and any reply thereto and being otherwise informed, IT IS HEREBY ORDERED:

1. Appellant’s Motion In Limine To Exclude Late Filed Plans and Reports is GRANTED.
2. Respondents proposed Exhibit No. 1320 (the Embankment Modeling Report) and proposed Exhibit No. 2055 (the Supplemental Wetlands Technical Memorandum) are excluded.
3. The additional untimely plans and reports identified by Appellants (Exhibit Nos. 1026, 1300, 1303, 1310, 1311, 1312, 1314, 1315, 1319, 1321, 1322, 1323, 2051, 2056, and 2128 are excluded.
4. Respondents may not rely on any of the excluded exhibits, or testify regarding them at the hearing.
5. Portions of pre-filed testimony relying upon these exhibits are stricken.

**AR 002582**

6. Within seven days of entry of this Order, Appellants will indicate to the Board the portions of pre-filed testimony that should be stricken.

SO ORDERED this \_\_\_\_\_ day of \_\_\_\_\_, 2002.

POLLUTION CONTROL HEARINGS BOARD

\_\_\_\_\_  
KALEEN COTTINGHAM, Presiding

\_\_\_\_\_  
ROBERT V. JENSEN, Member

\_\_\_\_\_  
WILLIAM LYNCH, Member

Presented by:

HELSELL FETTERMAN LLP

\_\_\_\_\_  
Peter J. Eglick, WSBA No. 8809  
Kevin L. Stock, WSBA No. 14541  
Michael P. Witek, WSBA No 26598

\_\_\_\_\_  
Rachael Paschal Osborn, WSBA No. 21618

Attorneys for Airport Communities Coalition

**AR 002583**

PCHB 01-160  
ORDER GRANTING APPELLANTS' MOTION IN LIMINE  
TO EXCLUDE LATE PLANS AND REPORTS - 2

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

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

Approved as to Form;  
Notice of Presentation Waived:

PORT OF SEATTLE

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Linda J. Strout, General Counsel, WSBA No. 9422  
Traci M. Goodwin, Senior Port Counsel, WSBA No. 14974

FOSTER PEPPER & SHEFELMAN PLLC

---

Roger A. Pearce, WSBA No. 21113  
Steven G. Jones, WSBA No. 19334

BROWN REAVIS & MANNING, LLP

---

Jay J. Manning, WSBA No. 13579  
Gillis E. Reavis, WSBA No. 21451

Attorneys for Port of Seattle

CHRISTINE O. GREGOIRE, Attorney General

---

Joan M. Marchioro, WSBA No. 19250  
Thomas J. Young, WSBA No. 17366  
Jeffrey B. Kray, WSBA No. 22174  
Assistant Attorneys General

Attorneys for Department of Ecology

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**AR 002584**

PCHB 01-160  
ORDER GRANTING APPELLANTS' MOTION IN LIMINE  
TO EXCLUDE LATE PLANS AND REPORTS - 3

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

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

**EXHIBIT C**

**AR 002585**

**Table C-2  
Summary of Site-Specific Metal  $K_d$ 's (L/kg)**

Metal	General Embankment Fill				Type 1 Fill <sup>a</sup>			
	Geometric Mean	Minimum	Maximum	n <sup>b</sup>	Geometric Mean	Minimum	Maximum	n <sup>b</sup>
Antimony	5,240	347	34,000	5	74,800	21,100	377,000	3
Arsenic	1,570	178	5,160	7	22,900	18,600	25,800	3
Beryllium	34,100	3,830	242,000	5	105,000	18,700	292,000	3
Cadmium	4,650	775	36,800	5	14,900	2,680	60,300	3
Chromium	5,630	1,280	12,800	7	31,200	25,300	40,700	3
Copper	7,130	3,060	25,800	7	48,100	31,100	74,500	3
Lead	6,610	3,390	23,500	7	16,700	13,700	21,200	3
Mercury	2,200	331	11,700	5	23,000	404	244,000	3
Nickel	10,400	4,680	26,800	7	62,300	44,200	115,000	3
Selenium	1,400	870	1,800	3	-- <sup>c</sup>	-- <sup>c</sup>	-- <sup>c</sup>	0
Silver	54,400	10,600	1,060,000	5	136,000	35,800	1,070,000	3
Thallium	43,500	8,000	514,000	5	121,000	43,000	264,000	3
Zinc	9,420	2,650	31,400	7	22,000	20,100	25,300	3

**Notes:**

- 1)  $K_d$  values for each metal were obtained by dividing the soil concentration (data in Table B-1) by the SPLP leachate concentration (data in Table C).
- 2) For a given metal, only data from samples with soil concentrations above the detection limit were used.
- 3) For samples with SPLP results below detection limits, a leachate concentration of one half the reporting limit was assumed.
- 4) Second round SPLP test results reported by North Creek Analytical were not used in developing  $K_d$  values, due to elevated detection limits associated with the the laboratory analyses.

- a) Includes drain layer, drain layer cover, and embankment face material
- b) Number of samples used to calculate mean value
- c) Not calculated (Not analyzed in SPLP tests and/or not detected in any soil samples)

Table C-1  
SPLP Metals Results for Fill Source Soil Samples (mg/L)

Source/Sample ID	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
First Round (February 2001)														
<b>Black River Quarry Pit</b>														
BRQ-S1	--	0.00672	0.0071	--	0.0005 U	0.00283	0.00310 B	0.00051	0.001 U	0.00171	0.0005 U	0.0005 U	--	0.0342
BRQ-S2	--	0.00080	0.0130	--	0.0005 U	0.0207	0.00427 B	0.0005 U	0.001 U	0.00137	0.00072	0.0005 U	--	0.01 U
BRQ-S3	--	0.00536	0.0077	--	0.0005 U	0.00484	0.00867 B	0.00068	0.001 U	0.00384	0.0005 U	0.0005 U	--	0.0102
<b>Kent Kangley Pit</b>														
KK-S1	--	0.0005 U	0.005 U	--	0.0005 U	0.00084	0.00083 B	0.0005 U	0.001 U	0.0005 U	0.0005 U	0.0005 U	--	0.01 U
KK-S2	--	0.0005 U	0.005 U	--	0.0005 U	0.00085	0.00066 B	0.0005 U	0.001 U	0.00053	0.0005 U	0.0005 U	--	0.01 U
KK-S3	--	0.0005 U	0.0052	--	0.0005 U	0.00071	0.00083 B	0.0005 U	0.001 U	0.00055	0.0005 U	0.0005 U	--	0.01 U
<b>Port Borrow Areas</b>														
BA1-S2	--	0.00239	0.0161	--	0.0005 U	0.00353	0.00372 B	0.00912	0.001 U	0.00334	0.0005 U	0.0005 U	--	0.0131
BA3-S1	--	0.00584	0.0140	--	0.0005 U	0.00384	0.00372 B	0.00259	0.001 U	0.00346	0.0005 U	0.0005 U	--	0.01 U
BA4-S1	--	0.00083	0.0211	--	0.0005 U	0.00398	0.00332 B	0.00104	0.001 U	0.00434	0.0005 U	0.00159	--	0.01 U
BA4-S2	--	0.00078	0.0241	--	0.0005 U	0.00736	0.00365 B	0.00056	0.001 U	0.00643	0.0005 U	0.0005 U	--	0.01 U
Second Round (November 2001)														
<b>Black River Quarry Pit</b>														
BRQ-SP-Comp1	--	--	--	--	--	--	0.05 U	--	--	--	--	--	--	--
BRQ-SP-Comp2	--	--	--	--	0.05 U	--	0.05 U	--	--	0.05 U	--	--	--	--
BRQ-SP-Comp3 <sup>2</sup>	0.000782	--	--	0.0000154	0.000278	--	0.05 U	--	0.00000791	0.05 U	--	0.0000198	0.0000056	--
BRQ-SP-Comp4	--	--	--	--	--	--	0.05 U	--	--	--	--	--	--	--
BRQ-SP-Comp5	--	--	--	--	--	--	0.05 U	--	--	--	--	--	--	--
BRQ-SP-Comp6 <sup>2</sup>	0.0000246	--	--	0.0000137	0.0000084	0.05 U	0.05 U	--	0.00000887	--	--	0.0000054	0.0000019	--
<b>CTI Pit #3</b>														
CTI Comp 6 <sup>2</sup>	0.0000172	--	--	0.0000215	0.0000145	--	0.05 U	--	0.00000521	--	--	0.0000044	0.0000007	--
<b>Kent Kangley Pit</b>														
TP1-Comp1 <sup>2</sup>	0.0000027 U	0.05 U	0.5 U	0.0000058 U	0.0000061 U	0.05 U	0.05 U	0.05 U	0.00000029	0.05 U	0.05 U	0.0000008 U	0.0000018	0.5 U
TP2-Comp2	0.05 U	0.05 U	0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.001 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U
TP3-Comp3	0.05 U	0.05 U	0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.001 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U
Westface Comp1	0.05 U	0.05 U	0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.001 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U
Midface Comp1	0.05 U	0.05 U	0.5 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.001 U	0.05 U	0.05 U	0.05 U	0.05 U	0.5 U
Eastface Comp1 <sup>2</sup>	0.000010	0.05 U	0.5 U	0.0000058 U	0.0000061 U	0.05 U	0.05 U	0.05 U	0.00000039	0.05 U	0.05 U	0.0000038	0.0000049	0.5 U
<b>Lakeland Hills Pit</b>														
LH Comp6 <sup>2</sup>	0.0000278	--	--	0.000160	0.0000671	--	--	--	0.0000688	--	--	0.0000109	0.0000112	--
<b>Lincoln-Summit Stockpile</b>														
BRQ-LS-Comp3 <sup>2</sup>	0.000463	--	--	0.0000058 U	0.0000061 U	--	--	--	0.00000284	0.05 U	--	0.0000006	0.0000285	--
<b>Marine View Pit (Type 2 Soil)</b>														
MVP-Comp3	--	--	--	0.05 U	--	--	--	--	--	--	--	--	--	--
MVP-Comp5	--	--	--	0.05 U	--	--	--	--	--	--	--	--	--	--
<b>Marine View Pit (Type 1B Soil)</b>														
MVP-1B-Comp1 <sup>2</sup>	0.0000179	--	--	0.0000295	0.0000194	--	--	--	0.0000272	--	--	0.0000052	0.0000007	--

Notes:

- 1) Unless otherwise noted, laboratory analyses for first and second rounds performed by North Creek Analytical, Bothell, WA.
  - 2) SPLP and laboratory analyses for antimony, beryllium, cadmium, mercury, silver and thallium for selected second round samples were performed by Frontier Geosciences, Seattle, WA.
- Not analyzed  
 U Not detected; value given is reporting limit  
 B Analyte was detected in laboratory blank; reported value biased high



mineral grains, such as feldspars and micas derived from erosion and weathering of rocks. Mineral grains such as these that are based on silicate chemical structure are very resistant to leaching and dissolution by water. This also effectively limits the leachability of the naturally occurring trace metals present in these grains. The low SPLP leachate concentrations observed for the fill soils (Table C-1) and resulting high site-specific  $K_d$  values are consistent with this hypothesis.

### **References Cited**

Alloway, B.J., 1990. *Heavy Metals in Soils*. Halsted, 339 pp.

USEPA, 1996. Soil Screening Guidance: Technical Background Document. U.S. Environmental Protection Agency, EPA/540/R95/128.

USEPA, 1999. Understanding variation in partition coefficient  $K_d$  values, Volume II: Review of geochemistry and available  $K_d$  values for cadmium, cesium, chromium, lead, plutonium, radon, strontium, thorium, tritium, and uranium. U.S. Environmental Protection Agency, EPA 401-R-99-004B.

## Development of Site-Specific Soil-Water Partition Coefficients for Metals

Soil-water partition coefficients ( $K_d$ ) for the metals antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc were determined for specific source areas being used for the embankment fill. For each metal,  $K_d$  values (L/kg) were determined according to

$$K_d = C_s/C_{SPLP}$$

where  $C_s$  is the metal concentration in a sample (mg/kg) and  $C_{SPLP}$  is the metal concentration in the SPLP leachate of the same sample (mg/L, as determined by EPA Method 1312). Soil metal concentrations are summarized in Table B-1, and SPLP test results are summarized in Table C-1.  $K_d$  values for each metal were computed using data from samples in which the metal was present at a concentration above the detection limit. Additionally, in cases where the leachate concentration was below the detection limit for the metal, a leachate concentration of one-half the detection limit was assumed for computation of the  $K_d$  value. Ranges and geometric mean values of  $K_d$  for the thirteen metals in general embankment and Type 1 fill materials are presented in Table C-2.

## Justification of Site-Specific Metals $K_d$ Values

The metal soil-water partition coefficients tabulated in Table C-2 are high in comparison to ranges of  $K_d$  for these metals in contaminated soils (USEPA, 1996; 1999). The explanation for the apparent disparity in metal  $K_d$  values between the present study and those published by USEPA lies in the nature and objectives of the studies.

The so-called 'default'  $K_d$  values adopted for purposes of evaluating health risks from soils at contaminated sites are largely based on the USEPA Soil Screening Guidance (USEPA, 1996). These values were developed based on (1) compilations of published  $K_d$  values in the scientific literature, and (2) values derived from chemical reaction computer models based on adsorption equilibrium. For the most part, the experimental procedures for determination of metal partitioning coefficients for these purposes generally involve bringing a sample of the soil in contact with an aqueous solution containing the metal of interest at a known concentration and measuring the amount removed from the solution after some time has been allowed for equilibration. Similarly,  $K_d$  values derived from modeling using equilibrium speciation codes such as MINTEQA2 generally assume that the metal is distributed between chemical species dissolved in water and species that are adsorbed on the surfaces of specific soil particles such as iron and aluminum hydroxides, clay minerals and organic matter.

Although this approach to determining  $K_d$  values may be conceptually valid for evaluating behavior and transport of metals in soils where the metals have been introduced as pollutants, it would be conceptually incorrect to adopt such a conceptual model for the case of the embankment fill materials. Metals occur naturally in soils at trace level concentrations similar to those observed in the fill soils (Alloway, 1990). Metals at these low concentrations are likely to bound as trace impurities in detrital

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## **Attachment C**

### **SPLP Testing and Development of Site-Specific Partitioning Coefficients**

d

Table B-4  
Adsorption Capacity of Soil Samples

Sample	Extractable Oxides <sup>a</sup>		Cation Exchange Capacity <sup>a</sup> mEq/kg	Clay Mineralogy <sup>b</sup>		Total Organic Carbon <sup>a</sup> wt %
	Iron mg/kg	Aluminum mg/kg		Major	Minor	
3RWS1,13,14,15, Composite	4,440	623	77	montmorillonite, kaolinite	montmorillonite, muscovite or illite	0.08
A4-TP1,2,3 Composite	9,990	1,680	216	kaolinite, montmorillonite	montmorillonite, muscovite or illite	0.11
BRQ-LS-Comp 3	6,560	1,270	152	kaolinite, montmorillonite		0.22
BRQ-SP-Comp 2	12,100	1,900	241	montmorillonite	celadonite/illite or kaolinite	0.19
CTI Comp 6	7,610	853	122	montmorillonite	kaolinite, illite or muscovite	ND
LH Comp 5	10,300	1,690	191	montmorillonite, kaolinite, illite		0.08
MVP-1B-Comp 1	9,510	1,210	190		montmorillonite, muscovite or illite	0.09
MVP-Comp 3	10,300	2,060	398	poor crystallinity	montmorillonite, illite	0.17
TP-2 Comp 1	6,080	2,710	93	montmorillonite, kaolinite		0.39

Notes:

- 1) Laboratory analyses performed by Columbia Analytical Services, Kelso, WA.
- 2) X-ray diffraction and electron microprobe analyses performed by Rosa Environmental and Geotechnical Laboratory, Seattle, WA.

ND Not detected

**Table B-3  
Maximum TPH Concentrations Detected in First Avenue  
Bridge and Black River Quarry Fills (mg/kg)**

<b>Location/Sample ID</b>	<b>Date Sampled</b>	<b>TPH-D</b>	<b>TPH-O</b>
<b>Black River Quarry</b>			
S-4	9/29/00	10 U	270
S-4	10/2/00	10 U	230
<b>First Avenue Bridge</b>			
001 WSDOT	10/01/99	29 U	99
002 WSDOT	10/01/99	27 U	73
004 WSDOT	10/01/99	26 U	85

**Notes:**

U Not detected

**Table B-2**  
**Soil Testing Results for Hamm Creek Fill Source ( $\mu\text{g}/\text{kg}$ )**

Compound	Station Number	
	C1	C2
Total DDT	14	11.3
4,4'-DDE	3.7	2.9
4,4'-DDD	6.7	5.3
4,4'-DDT	3.6	3.1
Lindane	0.52 U	0.55 U
Heptachlor	0.52 U	0.55 U
Aldrin	2.4	1.3
Dieldrin	6.1	6
Chlordane	4.4	1.5
Arochlor 1016	8.6 U	9.2 U
Arochlor 1221	34 U	37 U
Arochlor 1232	8.6 U	9.2 U
Arochlor 1242	8.6 U	9.2 U
Arochlor 1248	8.6 U	9.2 U
Arochlor 1254	160	76
Arochlor 1260	8.6 U	9.2 U
Total PCBs	160	76

**Notes:**

- 1) Samples C1 and C2 are from the US Corp of Engineers Hamm Creek Restoration Project.
- 2) C1 Collected 16-Jun-97, Lab Number 97-A008101
- 3) C2 Collected 16-Jun-97, Lab Number 97-A008102

U Not detected

**AR 002593**

Table B-1  
Metal Concentrations in Fill Source Soils (mg/kg)

Source/Sample ID	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
<b>Marine View Pit - Type 1B Soil</b>															
MVP-1B-Comp1 <sup>1</sup>	10/4/01	0.378	2.59	60.6	0.553	0.052	25.0	16.8	3.11	0.0110	29.1	0.4 U	0.186	0.185	39.0
MVP-1B-Comp2	10/4/01	0.5 U	2.94	74.6	0.5 U	0.5 U	21.2	16.0	2.36	0.2 U	24.6	0.5 U	0.5 U	0.5 U	31.8
MVP-1B-Comp3	10/4/01	0.4 U	2.88	55.1	0.4 U	0.4 U	28.9	12.5	2.19	0.2 U	31.8	0.4 U	0.4 U	0.4 U	33.7
MVP-1B-Comp4	10/4/01	0.4 U	1.36	59.6	0.4 U	0.748	25.1	13.4	2.20	0.2 U	27.9	0.4 U	0.4 U	0.4 U	34.9
MVP-1B-Comp5	10/4/01	0.4 U	2.30	47.7	0.4 U	0.783	26.0	13.2	2.04	0.2 U	27.2	0.4 U	0.4 U	0.4 U	33.7
MVP-1B-Comp6	10/4/01	0.3 U	2.48	57.5	0.340	0.818	23.5	19.1	5.00	0.2 U	27.5	0.3 U	0.3 U	0.3 U	40.0
<b>Marine View Pit - Type 2 Soil</b>															
MVP-Comp1	10/3/01	0.5 U	1.83	92.7	0.5 U	0.5 U	20.9	24.5	4.36	0.2 U	12.0	0.5 U	0.5 U	0.5 U	36.8
MVP-Comp2	10/3/01	0.4 U	1.73	128	0.583	0.4 U	21.7	25.2	5.52	0.2 U	12.8	0.4 U	0.4 U	0.4 U	38.8
MVP-Comp3	10/3/01	0.5 U	1.40	163	1.01	0.5 U	30.0	20.1	6.58	0.2 U	17.7	0.5 U	0.5 U	0.5 U	27.6
MVP-Comp4	10/3/01	0.5 U	1.82	89.5	0.5 U	0.5 U	21.5	25.8	4.46	0.2 U	13.0	0.5 U	0.5 U	0.5 U	36.2
MVP-Comp5	10/3/01	0.4 U	1.80	92.4	0.602	0.4 U	19.3	27.3	5.10	0.2 U	11.6	0.4 U	0.4 U	0.4 U	38.3
MVP-Comp6	10/3/01	0.3 U	1.87	96.8	0.572	0.3 U	22.7	24.7	4.98	0.2 U	12.2	0.3 U	0.3 U	0.3 U	35.9
<b>Port Borrow Areas</b>															
BA1-S2	2/2/01	--	10.1	88.0	--	0.585	27.3	17.8	19.8	0.18	26.5	0.4 U	0.109	--	75.1
BA3-S1	2/2/01	--	9.34	54.0	--	0.442	21.5	11.4	5.45	0.1 U	25.5	0.4 U	0.09 U	--	31.9
BA4-S1	2/2/01	--	3.40	99.4	--	0.343	29.7	15.0	6.95	0.1 U	31.5	0.3 U	0.08 U	--	37.5
BA4-S2	2/2/01	--	2.23	58.2	--	0.3 U	35.4	13.5	3.28	0.1 U	30.1	0.4 U	0.1 U	--	29.4
<b>Segale and Dupont</b>															
Composite 1	10/4/01	0.3 U	2.15	46.4	0.3 U	0.447	31.0	16.2	2.11	0.2 U	18.7	0.3 U	0.3 U	0.3 U	29.3
Composite 2	10/4/01	0.4 U	2.92	37.1	0.4 U	0.592	17.0	19.3	2.49	0.2 U	16.2	0.4 U	0.4 U	0.4 U	39.1
Composite 3	10/4/01	0.3 U	2.10	39.0	0.3 U	0.403	16.2	20.2	2.59	0.2 U	14.1	0.3 U	0.3 U	0.3 U	30.2
Composite 4	10/4/01	0.3 U	2.10	44.5	0.3 U	0.556	18.2	18.6	2.12	0.2 U	19.3	0.3 U	0.3 U	0.3 U	35.6
Composite 5	10/4/01	0.4 U	3.18	43.8	0.4 U	0.520	16.9	21.2	2.78	0.2 U	17.1	0.4 U	0.4 U	0.4 U	35.9
Composite 6	10/4/01	0.3 U	2.51	52.9	0.3 U	0.3 U	20.3	19.3	2.75	0.2 U	19.0	0.3 U	0.3 U	0.3 U	36.5

Notes:  
1) Unless otherwise noted, laboratory analyses were performed by North Creek Analytical, Bothell, WA.  
2) Laboratory analyses for antimony, beryllium, cadmium, mercury, silver and thallium performed by Frontier Geosciences, Seattle, WA.  
U Not detected; value given is reporting limit  
-- Not analyzed

Table B-1  
Metal Concentrations in Fill Source Soils (mg/kg)

Source/Sample ID	Date Sampled	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
<b>Black River Quarry</b>															
BRQ-SP-Comp1	10/3/01	0.4 U	1.47	28.2	0.4 U	0.4 U	36.7	97.5	2.35	0.2 U	41.8	0.580	0.4 U	0.4 U	58.8
BRQ-SP-Comp2	10/3/01	0.4 U	1.17	41.3	0.4 U	0.4 U	44.7	115.0	2.21	0.2 U	49.3	0.479	0.4 U	0.4 U	64.5
BRQ-SP-Comp3 <sup>2</sup>	10/3/01	0.271	5.20	25.2	0.477	0.063	32.7	107.0	2.82	0.0234	70.5	0.487	0.209	0.127	66.9
BRQ-SP-Comp4	10/3/01	0.5 U	0.866	27.8	0.5 U	0.5 U	42.0	131.0	1.84	0.2 U	42.5	0.555	0.5 U	0.5 U	67.3
BRQ-SP-Comp5	10/3/01	0.5 U	0.839	29.1	0.5 U	0.5 U	18.8	131.0	2.60	0.2 U	45.5	0.554	0.5 U	0.5 U	58.1
BRQ-SP-Comp6 <sup>2</sup>	10/3/01	0.267	0.927	27.2	0.609	0.061	46.3	111.0	1.85	0.0290	44.4	0.639	0.242	0.088	57.6
BRQ-S1	2/2/01	--	2.16	46.9	--	0.289	36.3	79.9	4.24	0.1 U	40.3	0.402	0.109	--	90.7
BRQ-S2	2/2/01	--	4.14	51.3	--	0.345	26.5	56.3	5.87	0.1 U	36.7	0.624	0.09 U	--	78.6
BRQ-S3	2/2/01	--	0.953	24.6	--	0.229	34.1	98.0	2.87	0.1 U	39.8	0.455	0.08 U	--	62.4
<b>CTI Pit #3</b>															
CTI Comp 1 <sup>2</sup>	6/29/01	0.585	4.37	36.2	0.777	0.067	23.8	24.0	2.82	0.00694	11.8	0.4 U	0.240	0.360	38.8
CTI Comp 2	6/29/01	0.5 U	3.10	31.7	0.5 U	0.3 U	15.1	21.2	2.47	0.2 U	12.3	0.3 U	0.3 U	0.5 U	36.4
CTI Comp 3	6/29/01	0.5 U	2.24	25.7	0.5 U	0.4 U	21.6	13.2	1.70	0.2 U	17.3	0.4 U	0.4 U	0.5 U	26.0
CTI Comp 4	6/29/01	0.5 U	3.09	31.6	0.5 U	0.4 U	22.1	15.9	1.85	0.2 U	15.4	0.4 U	0.4 U	0.5 U	33.6
CTI Comp 5	6/29/01	0.5 U	2.80	27.2	0.5 U	0.4 U	16.7	18.8	1.76	0.2 U	18.7	0.4 U	0.4 U	0.5 U	34.0
CTI Comp 6	6/29/01	0.5 U	2.95	48.1	0.5 U	0.4 U	17.0	36.5	3.20	0.2 U	12.0	0.415	0.4 U	0.5 U	43.9
<b>Kent Kangley Pit</b>															
TP-1 Comp 1 <sup>2</sup>	7/3/01	0.528	5.49	96.5	0.846	0.052	28.6	26.5	6.97	0.0706	29.4	0.409	0.320	0.282	65.7
TP-2 Comp 1	7/3/01	0.4 U	6.77	63.0	0.473	0.4 U	31.1	38.8	7.02	0.2 U	46.9	0.4 U	0.4 U	0.4 U	63.3
TP-3 Comp 1	7/3/01	0.5 U	6.36	64.3	0.538	0.4 U	25.2	30.0	6.32	0.2 U	42.1	0.4 U	0.4 U	0.5 U	58.0
Westface Comp 1	7/3/01	0.4 U	6.78	51.9	0.4 U	0.4 U	24.9	35.2	5.51	0.2 U	45.8	0.4 U	0.4 U	0.4 U	48.6
Midface Comp 1	7/3/01	0.4 U	6.51	76.5	0.4 U	0.4 U	31.1	30.2	5.56	0.2 U	33.8	0.458	0.4 U	0.4 U	50.8
Eastface Comp 1 <sup>2</sup>	7/3/01	0.525	5.71	54.0	0.614	0.187	30.5	38.6	7.98	0.0484	34.9	0.4 U	0.253	0.212	75.6
KK-S1	2/2/01	--	6.46	55.5	--	0.353	34.0	39.8	5.31	0.1 U	28.8	0.4 U	0.09 U	--	63.3
KK-S2	2/2/01	--	6.20	48.2	--	0.2 U	21.6	49.2	3.42	0.1 U	25.3	0.4 U	0.09 U	--	52.4
KK-S3	2/2/01	--	4.86	50.2	--	0.432	21.0	25.9	4.04	0.1 U	23.5	0.3 U	0.08 U	--	50.3
<b>Lakeland Hills Pit</b>															
LH Comp 1	6/29/01	0.5 U	3.80	65.1	0.5 U	0.4 U	22.3	22.9	3.18	0.2 U	21.7	0.4 U	0.4 U	0.5 U	40.6
LH Comp 2	6/29/01	0.5 U	3.86	75.2	0.5 U	0.4 U	19.4	18.6	3.07	0.2 U	20.1	0.4 U	0.4 U	0.5 U	38.8
LH Comp 3	6/29/01	0.4 U	3.93	59.9	0.4 U	0.3 U	19.7	22.3	2.67	0.2 U	22.0	0.448	0.3 U	0.4 U	38.9
LH Comp 4	6/29/01	0.5 U	3.33	54.1	0.5 U	0.4 U	22.0	20.6	2.67	0.2 U	17.5	0.4 U	0.4 U	0.5 U	34.3
LH Comp 5	6/29/01	0.4 U	4.52	50.3	0.4 U	0.4 U	22.7	20.0	2.96	0.2 U	17.9	0.411	0.4 U	0.4 U	35.4
LH Comp 6 <sup>2</sup>	6/29/01	0.608	3.91	63.3	0.613	0.052	22.0	22.7	2.73	0.0228	20.5	0.403	0.190	0.403	37.9
<b>Lincoln-Summit Stockpile</b>															
BRQ-LS-Comp1	10/4/01	0.4 U	2.73	74.5	0.4 U	0.605	36.8	26.4	3.12	0.2 U	41.8	0.4 U	0.4 U	0.4 U	42.7
BRQ-LS-Comp2	10/4/01	0.4 U	3.00	76.9	0.4 U	0.525	36.0	26.7	3.37	0.2 U	41.9	0.4 U	0.4 U	0.4 U	42.6
BRQ-LS-Comp3 <sup>2</sup>	10/4/01	0.653	3.22	85.1	0.702	0.114	40.3	22.9	4.12	0.0333	45.9	0.4 U	0.319	0.228	44.6
BRQ-LS-Comp4	10/4/01	0.4 U	2.23	63.5	0.4 U	0.451	30.4	17.3	5.29	0.2 U	38.7	0.4 U	0.4 U	0.4 U	34.6
BRQ-LS-Comp5	10/4/01	0.3 U	2.45	59.9	0.3 U	0.433	31.7	15.0	3.55	0.2 U	39.2	0.3 U	0.3 U	0.3 U	33.6
BRQ-LS-Comp6	10/4/01	0.4 U	2.47	64.5	0.4 U	0.4 U	32.4	17.6	4.16	0.2 U	37.4	0.4 U	0.4 U	0.4 U	37.5



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## **Attachment B**

### **Soil Sampling Results**

Table 2. Recommended acute and chronic effect thresholds for chemicals with potential to leach from fill soil.

Chemical	Acute/Chronic	Species	Duration (days)	Hardness (mg/L)	Endpoint	Conc. (µg/L)	Recommended Threshold (µg/L)	Reference
Antimony	Chronic	-	-	-	-	-	30 <sup>c</sup>	USEPA 1988
	Acute	-	-	-	-	-	87.5	USEPA 1988
Barium	Chronic	Daphnia magna (water flea)	2	45	EC50 (Immobilization)	14500	1450 <sup>b</sup>	Biesinger and Christiansen 1972
	Acute	Daphnia magna (water flea)	2	45	EC50 (Immobilization)	14500	7250 <sup>a</sup>	Biesinger and Christiansen 1972
Beryllium	Chronic	Daphnia magna (water flea)	21	100	Chronic Value (Reproduction)	51	51	Buikema 1986
	Acute	Caenorhabditis elegans (nematode)	4	-	LC50	140	70 <sup>a</sup>	Williams and Dusenbery 1990
Silver	Chronic	-	-	-	-	-	0.12 <sup>c</sup>	USEPA 1987
	Acute	-	-	50	-	-	1.0	WAC 173-201A
Thallium	Chronic	Gastrophryne carolinensis (toad)	7	-	LC50	110	55 <sup>a</sup>	Birge 1978
	Acute	Daphnia magna (water flea)	4	-	LC50	905	453 <sup>a</sup>	Kimball 1978

<sup>a</sup>LC50 divided by two to estimate low effect concentration.

<sup>b</sup>Acute EC50 divided by generic ACR of 10.

<sup>c</sup>Proposed USEPA water quality criterion.

LC50 = Median lethal concentration

EC50 = Median effect concentration

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exposure types, but chronic toxicity data should be based on static-renewal exposures, or ideally, flow-through exposure conditions.

### Chemical Analysis

Analytical verification of exposure concentrations in test solutions ensures that test organisms are actually exposed to nominal concentrations and also ensures that exposure levels are not fluctuating significantly over the course of the test. It is not essential that exposure concentrations be verified for acute data to be acceptable, although data from tests where chemical concentrations were verified may have been given preference over data derived from nominal concentrations. Given the relatively long duration of chronic toxicity tests, chemical concentrations should be analytically verified for data from these tests to be acceptable.

### Controls

Negative control organisms are reared in the same dilution water and conditions as test organisms, but are not exposed to stressors being evaluated. The negative control ensures test organisms are healthy and that observed responses in treated organisms are due to particular test conditions (e.g., test chemical). Negative control responses should meet acceptability guidelines published by. In AQUIRE, control responses are typically identified as "satisfactory," "unsatisfactory," or "indeterminate." For this evaluation, data were used only if controls were identified as "satisfactory" or "indeterminate."

### Dilution Water

The dilution water used in toxicity tests should not be of unusual origin or contain excessive organic carbon or suspended matter that may reduce bioavailability of chemicals to test organisms. In addition, dilution water should have a pH, temperature, salinity, and dissolved oxygen level relevant to the organisms being tested. Again, ASTM (1998) has published test protocols for acceptable dilution water conditions. These protocols were consulted to determine if toxicity test data were appropriate for use as effects thresholds.

### Endpoints

The endpoints considered for selection of acute data were primarily restricted to mortality, immobilization, and larval development. These endpoints are reported as either LC50 (median lethal concentration) or EC50 (median effect concentration) values in the AQUIRE database. For chronic test data, endpoints were based on mortality, reproduction, development, or growth. These results are typically expressed as the no observed effects concentration (NOEC)<sup>2</sup> and lowest observed effects concentration (LOEC)<sup>3</sup>, but may also be reported as LC50 or EC50 values.

### Species

Data for species from unusual environments (e.g., the Great Salt Lake) were not used to identify effects thresholds.

### REFERENCES

Biesinger, K.E. and G.M. Christensen. 1972. Effects of various metals on survival, growth, reproduction and metabolism of *Daphnia magna*. J. Fish. Res. Board Can. 29:1691-1700.

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<sup>2</sup> The NOEC is the highest tested concentration that did not result in statistically significant effects when compared to the control.

<sup>3</sup> The LOEC is the lowest tested concentration that resulted in statistically significant effects when compared to the control.

acute water quality criteria (WQC) (Stephan et al. 1985). For chemicals without proposed chronic criteria, chronic thresholds were determined by identifying the lowest chronic toxicity value for freshwater organisms, when available. For example, the chronic threshold of 51  $\mu\text{g/L}$  for beryllium was based on a life cycle study with the cladoceran *Daphnia magna*. For thallium, the lowest toxicity value identified was a 7-day LC50 of 110  $\mu\text{g/L}$  for survival of toad (*Gastrophryne carolinensis*) embryos. Although this study was not a complete early life stage test, it did encompass the earliest life stages of the toad and was the lowest appropriate value identified. Because the result was reported as an LC50 of 110  $\mu\text{g/L}$ , the recommended threshold of 55  $\mu\text{g/L}$  was determined by dividing the LC50 by two (see acute discussion above for basis). Finally, no appropriate chronic toxicity data were identified for barium for sensitive species. Consequently, the chronic effect threshold was estimated from the lowest acute LC50 for barium using a generic acute-chronic ratio (ACR) of 10. Use of an ACR is consistent with the USEPA methodology for deriving chronic WQC (Stephan et al. 1985). Furthermore, assuming a generic ACR of 10 in the absence of chemical-specific data is also consistent with USEPA guidance (USEPA 1991). Using this approach the recommended chronic effect threshold for barium was estimated to be 1450  $\mu\text{g/L}$ . A complete list of the proposed effects thresholds can be found in Table 2.

## TOXICITY DATA SEARCH METHODOLOGY

To select the best values to base the acute and chronic effects thresholds, it was necessary to determine which AQUIRE data were acceptable to identify these thresholds. The AQUIRE database contains a wide spectrum of toxicity data that vary in quality and types of information reported. The following outlines the guidelines used to review AQUIRE toxicity data for acceptability.

For toxicity data obtained from the AQUIRE database to be used to calculate an effect threshold, a minimum set of data quality requirements were established. These requirements were generally based on guidance established by the USEPA (Stephan et al. 1985). The AQUIRE database reports information that allows the user to evaluate the quality of the toxicity data provided. The following summarizes the key information categories reported by AQUIRE (termed fields) that were evaluated, and types of information in each field considered acceptable for the screening evaluation process.

### Exposure Duration

This field provides the period of time test organisms were exposed to a chemical or stressor. As such, exposure duration determines whether the toxicity test was acute (i.e., short-term) or chronic (i.e., long-term). Only data derived from tests that used exposure durations appropriate to the test species and type of toxicity test were used. For example, acute toxicity tests for most species are typically 96 hours in duration; however, 48 hours is considered sufficient for some species and types of tests (e.g. waterflea survival tests). Tests conducted over other short-term exposure durations (e.g., 24 hours) were used only if data from standard acute test durations (i.e., 48-96 hours) were not available. Ideally, chronic toxicity tests should encompass the life cycle of an organism through reproduction. This may be difficult to test in the laboratory for many organisms (particularly certain fish species, especially anadromous fish), so partial life cycle (e.g., juveniles through reproduction) or early life stage tests (embryo-larval life stages) were also considered acceptable.

### Exposure Type

The effects thresholds identified through this process are generally only appropriate to evaluate direct water column exposure to water column chemicals. Toxicity tests based on non-relevant exposure routes, such as injection, were not considered in this evaluation. Laboratory toxicity test exposure scenarios may be static, static-renewal, or flow-through. In static exposures, the exposure media (and associated chemical concentrations) is not renewed during the course of the test. In static-renewal exposures, the exposure media (and associated chemical concentrations) are renewed at regular intervals over the duration of the test. In flow-through tests, chemical concentrations are continuously renewed. Preference was given to data derived from flow-through tests because organisms are likely exposed to a relatively constant chemical concentration. Acceptable acute tests could be based on any of these

**TECHNICAL MEMORANDUM**

Date: February 6, 2002  
To: Tanya Barnett, Merret and Brown.  
From: Charlie Wisdom, Parametrix  
Subject: Effects Thresholds for Port of Seattle  
cc: Mike Riley, S.S. Papadopoulos & Associates  
Project Number: 556-2625-002  
Project Name: Port of Seattle Permit Appeal

This memo outlines the steps taken to determine appropriate effect thresholds for antimony, barium, beryllium, silver and thallium.

**EFFECT THRESHOLD DEVELOPMENT**

In each case, criteria proposed by either Washington State Department of Ecology (WDOE) or the United States Environmental Protection Agency (USEPA) were set as thresholds for evaluating water quality of environments potentially receiving fill leachate. When neither agency had proposed a criterion, acute and chronic effects thresholds were based on a search of the AQUIRE database maintained by USEPA. The AQUIRE database was established by USEPA in 1981, and contains information (e.g., toxicity data) on lethal and sublethal effect concentrations for aquatic organisms. The majority of the toxicity data reported in AQUIRE were published primarily between 1970 and the present. Table 1 identifies the database source of the effect threshold identified for each metal.

**Table 1. Database source used to develop acute and chronic effects thresholds for each metal**

<b>Metal</b>	<b>Database Source</b>
Antimony	USEPA Proposed Criterion Document
Barium	AQUIRE database
Beryllium	AQUIRE database
Silver	Acute - Washington Administrative Code Chronic - USEPA Proposed Criterion Document
Thallium	AQUIRE database

For chemicals without proposed acute criteria, appropriate acute thresholds were determined by dividing the lowest freshwater LC50<sup>1</sup> by two to estimate a low effect level. This is consistent with the USEPA's approach for deriving

<sup>1</sup> The LC50 is the chemical concentration that resulted in mortality of 50% of the organisms tested.

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## **Attachment A**

### **Recommended Thresholds for Chemicals with Potential to Leach from Fill Soils**

**Table 8**  
**Model Results for the Transport of Organics from Hamm Creek and First Avenue Bridge/Black River Quarry Fills**

	Maximum Discharge Concentration <sup>1</sup> (µg/L)	Ambient Water Quality Criteria <sup>2</sup> (µg/L)	Comments
<b>Hamm Creek Fill</b>			
DDD	0.0000	0.001	AWQC for sum of DDD, DDE and DDT
DDE	--		Not simulated as less mobile and at lower concentration than DDD
DDT	--		Not simulated as less mobile and at lower concentration than DDD
PCB (Arochlor 1254)	0.0000	0.014	AWQC for total PCBs
<b>First Avenue Bridge/Black River Quarry Fill</b>			
TPH Aromatic EC 10-12	15.3	320	CLARC II for Naphthalene. Maximum occurs after 325 years.
TPH Aromatic EC 12-16	10.9	1610	CLARC II for Acenaphthene. Maximum occurs after 610 years.
TPH Aromatic EC 16-21	4.9	225	CLARC II for Fluoranthene. Maximum at end of simulation (1000 years)
TPH Aromatic EC 21-34	--		Not simulated as less mobile and at lower concentration than EC 16-21

1) Maximum concentration in discharge from the drainage layer over a 1000-yr simulation.

2) Ambient water quality criteria (AWQC) from lower of WAC 173-201A or WAC 173-340, CLARC II database.

Ambient water quality criteria for TPH ranges is taken from representative compound within range (see comments).



**Table 7**  
**Model Results for the Transport of Metals from General Embankment Fill**

<b>Metal</b>	<b>Maximum Discharge Concentration<sup>1</sup> (µg/L)</b>	<b>Threshold<sup>2</sup> (µg/L)</b>	<b>Comments</b>
Antimony	0.0063	30	
Arsenic	0.25	190	
Beryllium	0.0063	51	
Cadmium	0.0056	1.03	
Chromium	0.80	178	
Copper	0.77	11.4	
Lead	0.25	2.5	
Mercury	0.0015	0.012	
Nickel	0.41	157	
Selenium	0.25	5.0	
Silver	0.0018	0.12	
Thallium	0.0018	55	
Zinc	2.5	104	
<b>Sensitivity Analysis Results</b>			
Arsenic	0.25	190	Lowest $K_d$ and General Fill Soil Concentration of 100 mg/kg (5x Fill Criteria)
Arsenic	0.25	190	Lowest $K_d$ and General Fill Soil Concentration of 200 mg/kg (10x Fill Criteria)

- 1) Maximum concentration in discharge from the drainage layer over a 1000-yr simulation.
- 2) Ambient water quality criteria (AWQC) or recommended threshold from Table 1.

**Table 6**  
**Initial Conditions for Soil and Groundwater, Fill Criteria and Partitioning Coefficients used in**  
**the First Avenue Bridge/Black River Quarry Simulations**

	Soil Concentration <sup>1</sup> (mg/kg)	K <sub>oc</sub> <sup>2</sup> (L/kg <sub>oc</sub> )	foc <sup>3</sup>	K <sub>d</sub> <sup>4</sup> (L/kg)	Initial Concentration <sup>5</sup> (µg/L)
<b>First Avenue Bridge/Black River Quarry Fill<sup>6</sup></b>					
Aromatic EC 10-12	1.54	2510	0.0017	4.3	361
Aromatic EC 12-16	2.24	5010	0.0017	8.5	263
Aromatic EC 16-21	12.10	15800	0.0017	26.9	450
Aromatic EC 21-34	56.78	126000	0.0017	214.2	265
<b>General Embankment Fill</b>					
Aromatic EC 10-12	0.0	2510	0.0017	4.3	0.0
Aromatic EC 12-16	0.0	5010	0.0017	8.5	0.0
Aromatic EC 16-21	0.0	15800	0.0017	26.9	0.0
Aromatic EC 21-34	0.0	126000	0.0017	214.2	0.0
<b>Drainage Layer, Drainage Layer Cover and Embankment Face Material</b>					
Aromatic EC 10-12	0.0	2510	0.0039	9.8	0.0
Aromatic EC 12-16	0.0	5010	0.0039	19.5	0.0
Aromatic EC 16-21	0.0	15800	0.0039	61.6	0.0
Aromatic EC 21-34	0.0	126000	0.0039	491	0.0

- 1) Soil concentrations computed from percent composition of Heavy Oil in TPH (San Juan and Parks).
- 2) Soil organic carbon-water partitioning coefficient (from WAC 173-340, Table 747-4).
- 3) Fraction organic carbon (from soil testing of embankment fill source areas).
- 4) Soil-water partitioning coefficient (= K<sub>oc</sub> x foc).
- 5) Initial concentration in the model (= soil concentration / K<sub>d</sub> x 1000).
- 6) Soil concentrations are highest detected concentration in soil sampling of First Avenue Bridge and Black River Quarry fill material. Only TPH-O was detected and highest concentration was 270 mg/kg.

**Table 5**  
**Initial Conditions for Soil and Groundwater, Fill Criteria and Partitioning Coefficients used in**  
**the Hamm Creek Simulations**

	Soil Concentration (µg/kg)	$K_{oc}^1$ (L/kg <sub>oc</sub> )	$foc^2$	$K_d^3$ (L/kg)	Initial Concentration <sup>4</sup> (µg/L)
<b>Hamm Creek Fill<sup>5</sup></b>					
DDD	6.7	45800	0.0017	77.9	0.086
DDE	3.7	86405	0.0017	146.9	0.025
DDT	3.6	677934	0.0017	1152	0.003
PCB <sup>6</sup>	160	534291	0.0017	908.3	0.176
<b>General Embankment Fill</b>					
DDD	0.0	45800	0.0017	77.9	0.0
DDE	0.0	86405	0.0017	146.9	0.0
DDT	0.0	677934	0.0017	1152	0.0
PCB	0.0	534291	0.0017	908.3	0.0
<b>Embankment Face Material</b>					
DDD	0.0	45800	0.0039	178.6	0.0
DDE	0.0	86405	0.0039	337.0	0.0
DDT	0.0	677934	0.0039	2644	0.0
PCB	0.0	534291	0.0039	2084	0.0

- 1) Soil organic carbon-water partitioning coefficient (from WAC 173-340, Table 747-1 for DDT compounds and geometric mean from literature values for PCB Arochlor 1254 [Mackay et al., 1992]).
- 2) Fraction organic carbon (from soil testing of embankment fill source areas).
- 3) Soil-water partitioning coefficient (=  $K_{oc} \times foc$ ).
- 4) Initial concentration in the model (= soil concentration /  $K_d$ ).
- 5) Soil concentrations are highest levels detected in soil sampling of Hamm Creek fill material.
- 6) Only Arochlor 1254 detected in soil samples.

**Table 4**  
**Initial Conditions for Soil and Groundwater, Fill Criteria and Partitioning**  
**Coefficients used in the General Embankment Fill Simulations**

	Soil Concentration <sup>1</sup> (mg/kg)	K <sub>d</sub> <sup>2</sup> (L/kg)	Initial Concentration <sup>3</sup> (µg/L)
<b>General Embankment Fill</b>			
Antimony	16	5,240	3.1
Arsenic	20	1,570	12.7
Beryllium	0.6	34,100	0.02
Cadmium	2	4,650	0.4
Chromium	2,000	5,630	355
Copper	36	7,130	5.0
Lead	250	6,610	37.8
Mercury	2	2,200	0.9
Nickel	110	10,400	10.6
Selenium	5	1,400	3.6
Silver	5	54,400	0.09
Thallium	2	43,500	0.05
Zinc	85	9,420	9.0
<b>Type 1 Fill</b>			
Antimony		74,800	0.0063
Arsenic		22,900	0.25
Beryllium		105,000	0.0063
Cadmium		14,900	0.0056
Chromium		31,200	0.80
Copper		48,100	0.77
Lead		16,700	0.25
Mercury		23,000	0.0015
Nickel		62,300	0.41
Selenium		1,400	0.25
Silver		136,000	0.0018
Thallium		121,000	0.0018
Zinc		22,000	2.5
<b>Sensitivity Analysis - Arsenic</b>			
<b>Low K<sub>d</sub> and General Fill Soil Concentration at 5x Fill Criteria</b>			
General Fill	100	178 <sup>4</sup>	56
Type I Fill		18600 <sup>4</sup>	0.25
<b>Low K<sub>d</sub> and General Fill Soil Concentration at 10x Fill Criteria</b>			
General Fill	200	178 <sup>4</sup>	112
Type I Fill		18600 <sup>4</sup>	0.25

- 1) Soil concentrations for general fill set at the 401 Soil Fill Criteria as given in Table 1 unless otherwise noted
- 2) Soil-water partitioning coefficient (geometric mean values from Attachment B)
- 3) For general fill, calculated from soil concentration and K<sub>d</sub>; for Type 1 fill, taken as the mean value of SPLP leachate concentrations for Kent-Kangley samples
- 4) Lowest K<sub>d</sub> value calculated from soil and SPLP leachate concentrations

**Table 3**  
**Parameters used in the Transport Analysis**

Parameter	Units	General Embankment Fill	Type 1 Fill <sup>1</sup>
<b>Bulk Density (<math>\rho_b</math>)</b>	kg/L	2.0	1.6
<b>Dispersion</b>			
Longitudinal ( $\alpha_L$ )	ft	25	25
Transverse ( $\alpha_T$ )	ft	2.5	2.5
<b>Fraction Organic Carbon</b>		0.0017	0.0039
<b>Partitioning Coefficient (<math>K_d</math>)<sup>2</sup></b>	L/kg		
Antimony		5,240	74,800
Arsenic		1,570	22,900
Beryllium		34,100	105,000
Cadmium		4,650	14,900
Chromium		5,630	31,200
Copper		7,130	48,100
Lead		6,610	16,700
Mercury		2,200	23,000
Nickel		10,400	62,300
Selenium		1,400	1,400
Silver		54,400	136,000
Thallium		43,500	121,000
Zinc		9,420	22,000
DDD		77.9	178.6
DDE		146.9	337.0
DDT		1,152	2,644
PCB (Arochlor 1254)		908.3	2,084
TPH Aromatic EC 10-12		4.3	9.8
TPH Aromatic EC 12-16		8.5	19.5
TPH Aromatic EC 16-21		26.9	61.6
TPH Aromatic EC 21-34		214.2	491.4

1) Includes drain layer, drain layer cover, and embankment face material

2)  $K_d$ 's for metals developed from sampling of source area material.

$K_d$ 's for organics based on WAC 173-340 using organic carbon partitioning coefficient and fraction organic carbon.

**Table 2**  
**Hydraulic and Physical Parameters of Embankment Material**

<b>Parameter</b>	<b>Units</b>	<b>General Embankment Fill</b>	<b>Type 1 Fill<sup>1</sup></b>
Hydraulic Conductivity	ft/day	3.8	25
$\alpha$ (van Genuchten parameter)	1/ft	2.7	2.3
$\beta$ (van Genuchten parameter)	-	1.35	9.0
Porosity	-	0.25	0.40
Specific Storage	-	0.00	0.00
Residual Moisture Content	-	0.02	0.05

1) Includes drain layer, drain layer cover, and embankment face material

**AR 002609**

**Table 1  
Comparison of Water Quality and Fill Criteria**

Constituent	Ambient Water Quality Criteria <sup>1</sup> (µg/L)	Recommended Thresholds <sup>2</sup> (µg/L)	Soil Fill Criteria <sup>3</sup>	
			Type 1 Fill <sup>4</sup> (mg/kg)	General Embankment Fill <sup>5</sup> (mg/kg)
Antimony	NA	30	16	16
Arsenic	190		7	20
Barium	NA	1450	12000	NS
Beryllium	NA	51	0.6	0.6
Cadmium	1.03		1	2
Chromium	178		42	2000
Chromium(+6)	10		19	19
Copper	11.4		36	36
Lead	2.5		24	250
Mercury	0.012		0.07	2
Nickel	157		48	110
Selenium	5		5	5
Silver	NA	0.12	5	5
Thallium	NA	55	2	2
Zinc	104		85	85

NA: Ambient Water Quality Criteria not available in WAC 173-201A.

NS: Not specified.

1) WAC 173-201A, using hardness of 100 mg/L.

2) See Attachment A

3) From 401 Water Quality Certification, Attachment E.

4) Includes drainage layer, drainage layer cover and embankment face material.

5) The U.S. Fish and Wildlife Service ecological criteria for the top three feet of the embankment are not included in this modeling effort. The ecological criteria applied to the top three feet of the embankment are lower than the general embankment fill criteria and therefore will leach at lower concentrations than the remainder of the fill.

AR 002610

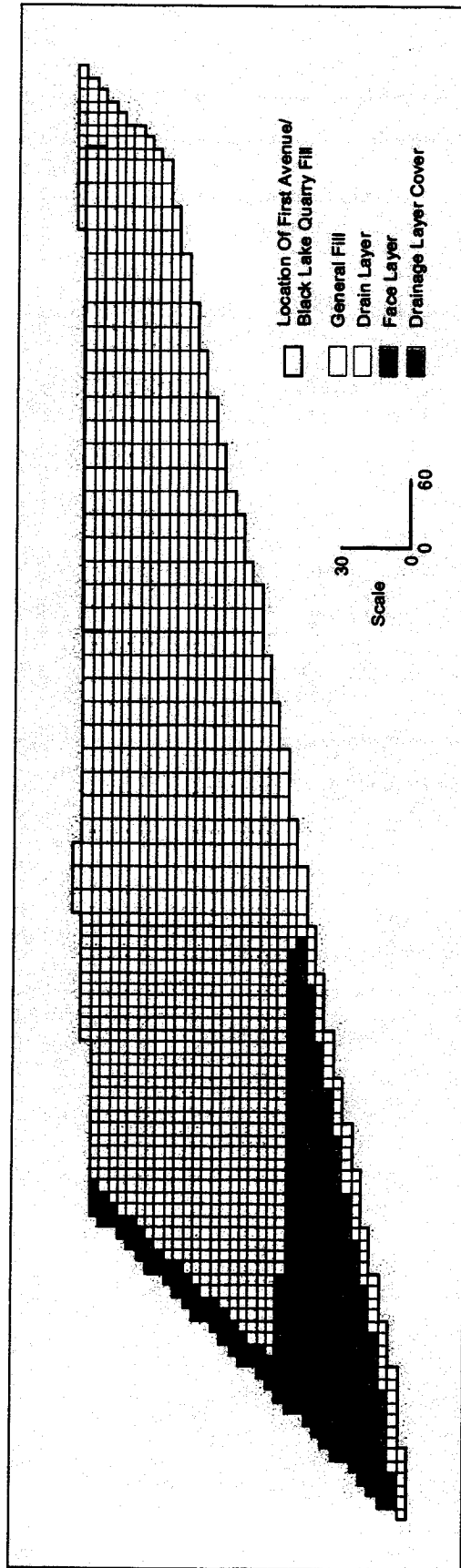


Figure 5 Model Cross-Section for First Avenue / Black Lake Quarry Fill Simulations



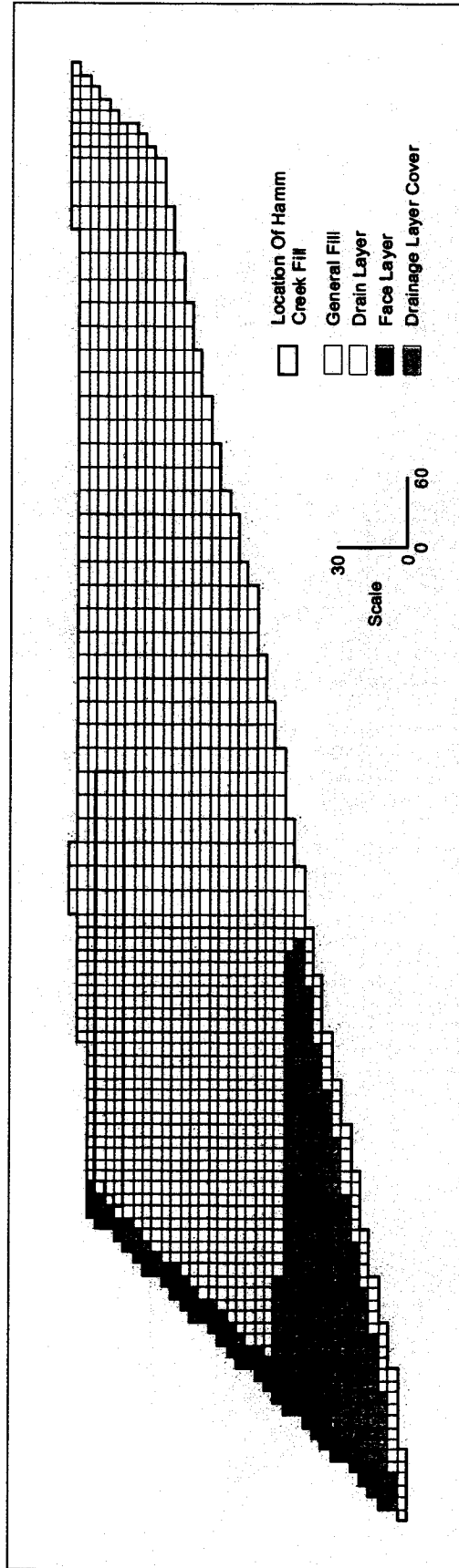


Figure 4 Model Cross-Section for Hamm Creek Fill Simulations

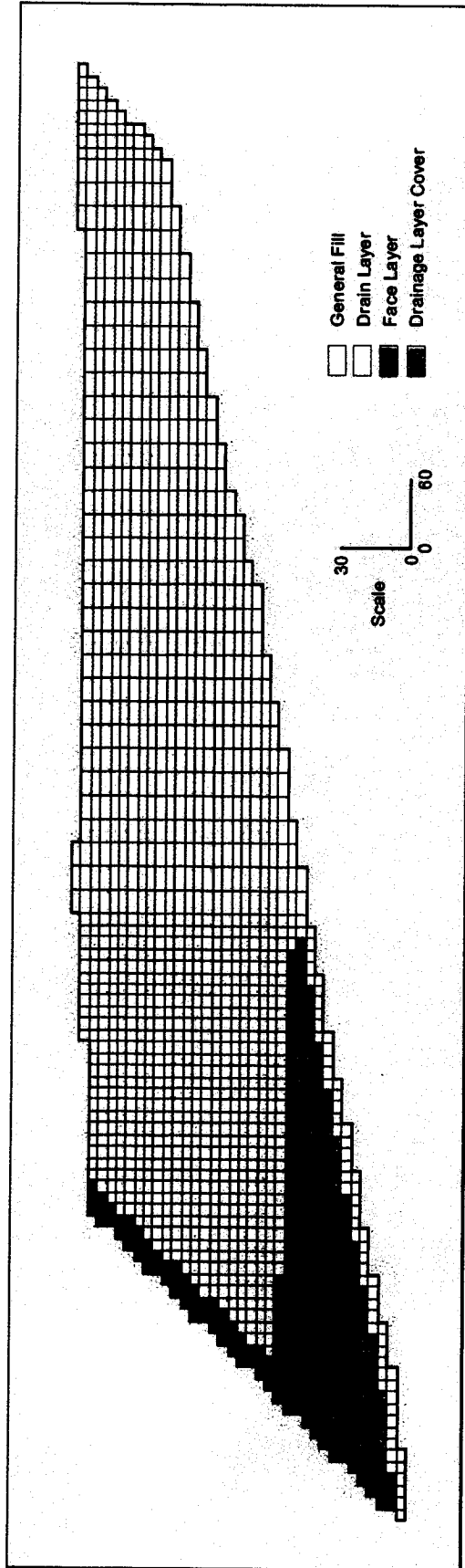


Figure 3 Model Cross-Section for General Embankment Fill Simulations

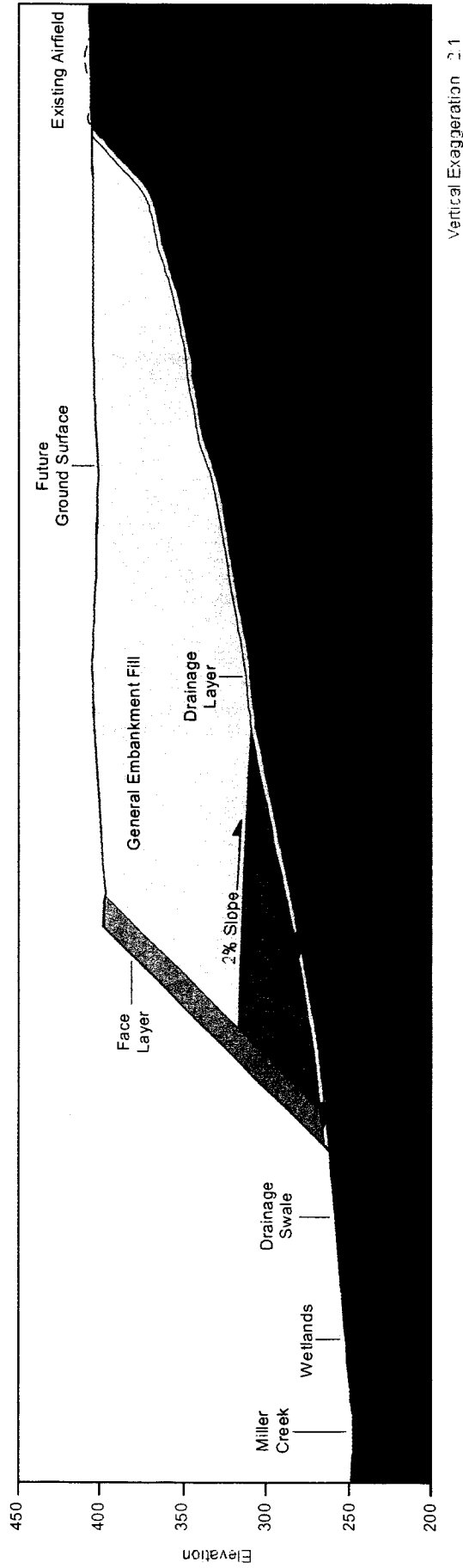
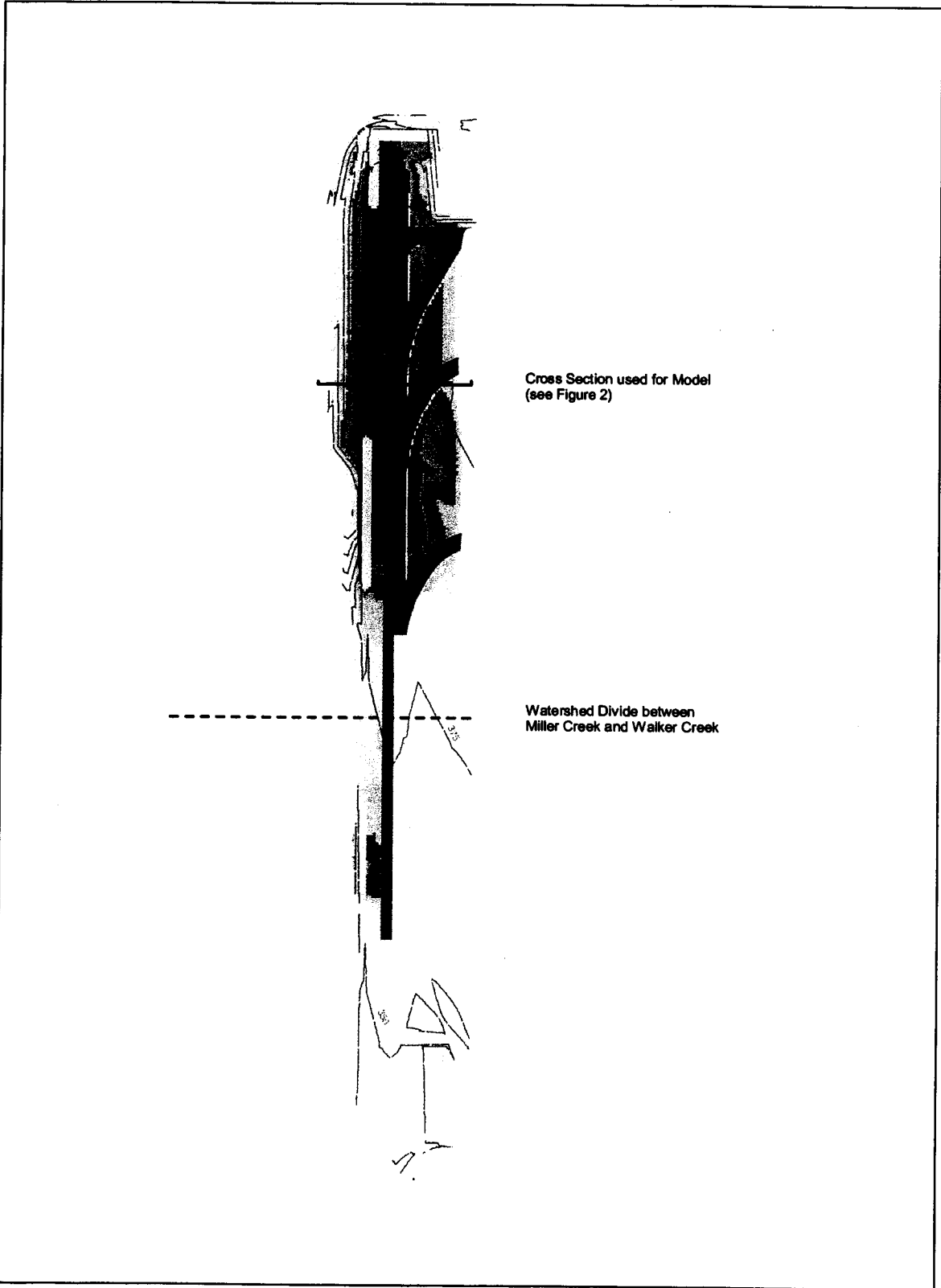


Figure 2 Typical Cross-Section Through the Embankment Fill



Cross Section used for Model  
(see Figure 2)

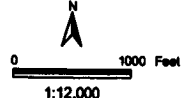
Watershed Divide between  
Miller Creek and Walker Creek

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**Depth of Fill (feet)**

- 0 - 20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100
- 101 - 120
- 121 - 140
- 141 - 160

- Impervious Area
- "Bult" Elevation Contours (25 ft interval)



**Figure 1**  
Embankment Fill Layout

Figure provided by Pacific  
Groundwater Group, Inc.

## Section 6.0

### References

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above applicable water-quality criteria. If chemical or microbiological decay is considered, and given the long time frame for discharge to occur, it is highly unlikely that petroleum hydrocarbons from the historic fill sources will be found in discharge from the embankment fill.

## **Section 5.0**

### **Conclusions**

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The modeling effort discussed in this report was used to simulate metals and organic compounds potentially found in the embankment fill material. In the case of metals, the entire embankment fill was modeled at the fill criteria. Arsenic was also modeled at concentrations well above the fill criteria to test the sensitivity of the model. In the case of organic compounds, historic fill areas that may have detectable levels of organic compounds were included based on fill locations provided by the construction contractors.

In all cases simulated, the discharge from the embankment fill is less than applicable surface water criteria. These simulations are conservative as they do not account for further attenuation and dilution between the embankment fill and surface water bodies by mixing and attenuation in the perched aquifer, attenuation during seepage through the till, mixing and attenuation in the underlying regional aquifer, attenuation in peat and other soils with relatively high organic carbon content, or mixing, sorption and settling in stormwater systems.

#### **5.1 Drainage Layer**

The transport simulations indicate that dissolved metals concentrations in seepage from the drainage layer will be very low, derived almost exclusively from the leachable metals content of the drainage layer material. Any metals leached from fill by infiltrating groundwater will be strongly attenuated both within the fill and within the drainage layer, and will not impact concentrations observed at the seepage face.

#### **5.2 Fill Criteria and Seepage Quality**

Metals occurring in the fill at concentrations equal to or below the fill criteria will not result in concentrations in the seepage from the embankment in excess of the applicable water-quality criteria. This conclusion holds even if the entire fill is modeled for the most mobile metal (arsenic) at concentrations of ten times higher than the fill criteria, and indicates that the fill criteria are indeed protective with respect to potential impacts from metals.

#### **5.3 Impacts from Historic Fill Sources**

Historic fill material that may contain detectable concentrations of some organic compounds do not pose a threat to water quality. Heavier organic compounds, such as DDD and PCBs, were found in low concentrations in some samples collected at the Hamm Creek fill source, but these compounds have a low potential for mobility. Consequently, even modeling the entire Hamm Creek fill at the highest detected concentrations of DDD and PCB did not show any transport of these compounds through the fill and discharging from the embankment.

Lighter organic compounds, associated with the lighter ranges of petroleum hydrocarbons, have a greater potential to migrate through the fill. However, even in the absence of chemical or microbiological decay, these compounds are not expected to occur in discharge

compounds in groundwater is below applicable water quality criteria. Based on the predicted time frame for the discharge to occur, even very low decay rates would result in elimination of the TPH compounds prior to discharging from the embankment fill.



## **4.5 Modeling Results**

### **4.5.1 Transport of Metals**

For each of the simulations performed, the maximum metal concentrations at the drainage layer seepage face over the entire simulation are summarized on Table 7. In all cases, the contribution of metals leached from the fill to seepage along the drainage layer is negligible. The reason for this is the high adsorption capacity of both fill and drainage layer material, which effectively limits transport of metals in groundwater over any reasonable time scale. The metal concentrations in seepage reflect metals derived from within the drainage layer material and are below ambient water-quality criteria.

Simulation results are also presented in Table 7 for the sensitivity analysis for arsenic, the most mobile of the metals considered, where the minimum (rather than mean) calculated soil-water partitioning coefficient values were used. The sensitivity analysis shows that model results are unaffected by substantial changes in the partitioning coefficients or the fill criteria. These results indicate that the fill criteria are very conservative and that model results would not change with any reasonable changes made to model parameters.

### **4.5.2 Transport from the Hamm Creek Fill**

Results for the Hamm Creek fill are presented in Table 8. Simulations were conducted for DDD and PCB (Aroclor 1254). Model results show that the attenuation capacity of the embankment fill is large compared to the volume of Hamm Creek soil and the high  $K_d$  values for these compounds. Consequently, neither compound is expected to discharge from the embankment fill.

Simulations were not conducted for DDE or DDT. These compounds were detected at lower concentrations than DDD and are less mobile (higher  $K_{oc}$  value). Therefore, they are less likely than DDD to be in water discharging from the embankment fill. Consequently, there is no need to simulate these compounds in order to predict their concentration in the embankment discharge.

### **4.5.3 Transport from the First Avenue Bridge/Black River Quarry Fill**

Results for the First Avenue Bridge/Black River Quarry fill are presented in Table 8. Simulations were conducted for the lightest range of aromatic compounds associated with heavy oil TPH (TPH-O). The aromatic compounds are more mobile than the aliphatic compounds due to the high  $K_{oc}$  values for aliphatics. The lower  $K_{oc}$  for aromatic compounds also means that the computed initial concentration for aromatics is higher than for aliphatics. Therefore, simulation of the aromatic compounds is conservative as they are both more mobile and have a higher initial concentration.

The TPH compounds are subject to decay through chemical and microbiological processes. This is particularly the case for the lighter aromatic ranges. To be conservative, the simulations were conducted without including decay process.

Based on the simulations, bw concentrations are predicted in the discharge from the embankment fill in several hundred years. The predicted concentration of representative TPH

#### 4.4.3 First Avenue Bridge Fill and Black River Quarry Fill

Concerns have been raised regarding the presence of total petroleum hydrocarbons (TPH) in fill from the First Avenue Bridge and Black River Quarry fill sources. The data from these sites are provided in Attachment B and are summarized below:

- At the First Avenue Bridge fill source, a maximum concentration of 810 mg/kg TPH in the heavy oil range was detected at the fill source. The TPH-impacted area of this source was isolated, and soils from this location were not imported to the Third Runway. The maximum concentration detected in soil imported to the Third Runway was 99 mg/kg TPH in the heavy oil range.
- Some of the early material placed at the Third Runway from the Black River Quarry contained incidental asphaltic material. Samples collected of this material contained a maximum of 270 mg/kg TPH in the heavy oil range.

The First Avenue Bridge and early Black River Quarry fill were placed near the upper east end of the fill (see Figure 1). The model setup and the location of the First Avenue Bridge/Black River Quarry fill are shown in Figure 5.

The transport simulation for the First Avenue Bridge/Black River Quarry fill material was based on the conservative assumption that the entire First Avenue Bridge and Black River Quarry fill material with detected TPH concentration contained a heavy oil concentration in soil of 270 mg/kg, the highest of all detected concentrations. The initial dissolved concentration was computed using WAC 173-340-747 and information on the composition of the heavy oil range in TPH analysis (San Juan and Park, unpublished data). The parameters used in the computations and initial dissolved concentration are shown in Table 6.

#### 4.4.4 Sensitivity Analysis

A sensitivity analysis was conducted to see how model results change, if different input parameters are used. The sensitivity of model results to input parameters was tested by varying two of the most critical transport parameters: soil-water partitioning coefficient and the concentration of a compound in fill soil. A low partitioning coefficient indicates that the compound is more readily transported. It also results in a higher initial dissolved concentration in groundwater. As the soil concentration increases and the partitioning coefficient decreases, the compound is both more mobile and is simulated with a higher initial dissolved concentration in the model.

For the sensitivity simulation, the most mobile metal (lowest partitioning coefficient) was selected. To make the analysis conservative, the lowest partitioning coefficient from the source area data was selected. Consequently, arsenic was the metal selected for the analysis with a partitioning coefficient ( $K_d$ ) of 178 L/kg. The soil concentration of arsenic was set at 5 times and 10 times the fill criteria of 20 mg/kg, or 100 and 200 mg/kg, respectively.

The model setup was the same as the general embankment fill setup, but with transport parameters corresponding to the low  $K_d$  and high arsenic concentration in the fill (see Table 4).

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The concentration of organic compounds included in this study was taken from the results of source area soil testing of fill material that may have been deposited in the embankment. To be conservative, the highest concentration observed in the data from these historic fill sources was assigned to the entire fill volume from these sources.

#### **4.4 Simulations**

The VS2D model was applied to three simulations. The first series of simulations were designed to determine if the fill criteria were protective of water quality. These simulations were applied with the metals concentration in the fill set at the 401 Certification fill criteria. The most mobile metal was also tested at concentrations above the fill criteria to test the sensitivity of the model to the fill concentration.

Two simulation scenarios were designed to test whether some of the existing fill could adversely affect water quality in Miller Creek. These scenarios consist of the DOT First Avenue Bridge/Black River Quarry fill and the Hamm Creek fill. These borrow sources have been scrutinized for possibly containing low levels of regulated organic compounds in soils. Each of the model simulations is described in the following sections.

##### **4.4.1 General Embankment Fill**

The simulations were conducted for all the metals listed in the 401 Certification fill criteria (see Table 1). The simulations were allowed to run for a simulation time of 1000 years. The concentration of metals in groundwater in the drainage layer and at the end of the drainage layer was monitored to determine the maximum concentration computed over the length of the model run, i.e., at yearly intervals over a period of 1000 years.

##### **4.4.2 Hamm Creek Fill**

Samples collected by the U.S. Army Corps of Engineers (USCOE) at the Hamm Creek fill source detected low levels of PCBs and DDTs at maximum concentrations of 0.16 mg/kg and 0.014 mg/kg, respectively. Samples collected by The Boeing Company at this site did not detect these constituents. Hamm Creek data are presented in Attachment B.

Organic carbon partitioning coefficients ( $K_{oc}$ ) for DDT compounds were taken from WAC 173-340-747, Table 747-1. Among the PCB compounds, only Aroclor 1254 was detected and the  $K_{oc}$  value for Aroclor 1254 was taken from literature values (Mackay et al., 1992). The partitioning coefficients and the chemical concentration in soil were used to compute the initial dissolved phase concentration in the Hamm Creek fill. The concentration of chemicals in the fill, the partitioning coefficients, and the initial dissolved concentrations are shown in Table 5.

The Hamm Creek fill is located in the north safety area and extends to the outer edge of the general embankment fill, but is separated from the face of the embankment by the drainage layer on the face of the embankment (see Figure 1). This older fill area does not have drainage layer or drainage layer cover fills. The model setup and location of the Hamm Creek fill is shown in Figure 4.

### **4.3 Initial and Input Values**

Initial values are the conditions established to describe the soil moisture and the concentration of a substance at the start of a simulation. Input values define the inflow and outflow of water and dissolved substances over time.

#### **4.3.1 Flow Values**

The primary initial condition for flow is the soil moisture content, and the primary input is infiltration at the land surface (recharge). There are no injection or extraction wells in the embankment fill; therefore, recharge is the only input to the model that varies with time.

Groundwater recharge is applied to the upper surface of the model section. No recharge is applied to the sloping outer face of the model where most of the precipitation is expected to run off. The recharge rate is taken from the average infiltration computed in the HSPF model developed for Miller and Walker Creeks (Pacific Groundwater Group, 2001). The average annual recharge is applied continuously throughout each model run. This is a reasonable application of recharge since transport of metals and other dissolved substances in the fill is a slow process that occurs over a period of years. Consequently, the use of daily recharge rates would add needless complexity to the modeling process without affecting the model results. Based on the HSPF results, a recharge rate of 17 inches per year was applied.

The initial moisture content defines the distribution of soil moisture in the fill at the beginning of a simulation. If the moisture content is high, then water will discharge from the fill sooner than if the moisture content is low. In either case, water eventually discharges from the fill and flows out through the drainage layer. Consequently, the initial moisture content is not a critical parameter for long-term simulations (simulation periods of 1000 years in the present study). A uniform moisture content of half the fully saturated moisture content was selected as a reasonable starting point.

#### **4.3.2 Transport Values**

The initial condition for transport is used to set the concentration of dissolved metals and other compounds in the fill. The simulation then predicts how these dissolved compounds move through the fill and the concentration of compounds at the end of the drainage layer.

The concentration of metals in embankment fill soils was defined as equal to the fill criteria specified in the 401 Certification (see Table 1). However, the required input to the model is the initial concentration of a substance in groundwater rather than the concentration in soil. Therefore, the fill criteria are divided by the soil-water partitioning coefficients to compute the initial dissolved concentration conditions in the model. The initial condition for a specific metal in the general embankment fill was computed using the partitioning coefficients computed for that metal (see Table 3). The initial condition for the drainage layer used only the partitioning coefficients and soil concentrations for the Kent-Kangley material since the bulk of the drainage layer material has come from this source area. The initial conditions, fill criteria, and partitioning coefficients for each metal are shown in Table 4.

#### 4.2.2 Transport Parameters

Transport parameters include parameters related to how fast dissolved substances move through the soil, and parameters that describe the loss of the substances by decay or breakdown processes.

Metals do not decay or breakdown and, therefore, no decay processes were considered for metals. Some organic compounds of interest in this study do decay with time, and the decay process of these compounds was considered. However, to be conservative, the transport analysis of organic compounds was conducted without incorporating decay processes.

Metals form complex interactions with soil particles and consequently may adsorb or desorb from soil particles in contact with groundwater. The primary parameter describing the relationship between the concentration of a substance in soils and the concentration of the same substance in water is the soil-water partitioning coefficient ( $K_d$ ).

Similarly, organic compounds adsorb to organic carbon in the soil. The partitioning coefficient for organic compounds is affected by both the organic carbon partitioning coefficient ( $K_{oc}$ ) and the fraction of organic carbon in the embankment fill material.

The site-specific soil-water partitioning coefficients for metals in this study were computed from the results of the analysis of metals in soils and the SPLP testing. The analysis of metals in soils determines the concentration of the specified metals in the soil. The SPLP test on the same soil samples determines the concentration of those metals in water that is in contact with the soil. Therefore, the ratio between the soil concentration and the SPLP concentration is the soil-water partitioning coefficient. Site-specific soil-water partitioning coefficients were developed for soils from the principal source areas for the general embankment fill and the drainage layer (see Attachment C). The results of these computations are shown in Table 3.

The soil-water partitioning coefficients for organic compounds were computed from  $K_{oc}$  values found in WAC 173-340, Tables 747-1 and 747-4. These are based on literature values of  $K_{oc}$  and are used if site-specific data are not available. The organic carbon content of source area soils was measured through laboratory analysis. The average organic carbon content was measured at 0.17 and 0.39 percent for the general embankment fill and the drainage layer material, respectively. The corresponding  $K_d$  values for organic compounds are listed in Table 3.

The partitioning of metals between soil and water using  $K_d$  also requires determination of the bulk density of the soil. Bulk density is computed as the product of the mass density of the solids making up the soil (normally  $2.65 \text{ g/cm}^3$  for sandy soils; Domenico and Schwartz, 1990) and the solid volume fraction of the soil ( $1 - n$ , where  $n$  is porosity). The bulk densities of general embankment fill and drainage layer material were derived from laboratory measurement from the source areas and are given in Table 3.

In addition to soil-water partitioning, the transport analysis also uses parameters that describe how the dissolved substances spread due to flow around particles and the irregular shape and size of pore spaces. These parameters are the dispersion/diffusion coefficients and include longitudinal and transverse dispersion coefficients and molecular diffusion coefficients. The dispersion coefficients are typically much larger than the molecular diffusion coefficient and, therefore, dominate the spreading process making the diffusion rate insignificant. The dispersion coefficients are taken from literature values and are provided in Table 3.

## 4.2 Model Parameters

Model parameters fall into two broad categories: parameters related to groundwater flow, and parameters related to the transport of dissolved substances in groundwater.

### 4.2.1 Flow Parameters

The primary flow parameter in groundwater modeling is the saturated hydraulic conductivity. Hydraulic conductivity is a measure of the resistance to groundwater flow by the soil matrix. Finer-grain material is more resistant to flow than is coarse material and, therefore, has a lower hydraulic conductivity. In the present model, the drainage layer and the material along the outer face of the fill are relatively coarse, and the general embankment fill material is relatively fine. Because the general embankment fill is deposited in layers, preferential pathways may form between layers. Consequently, it is assumed that there will be greater resistance to flow in the vertical direction than in the horizontal direction. This results in a lower vertical hydraulic conductivity than horizontal hydraulic conductivity. Because the drainage layer is relatively coarse and is only 3 feet thick, the vertical hydraulic conductivity was not adjusted for this layer. Values of hydraulic conductivity were estimated from the grain-size specifications for the fill material and the drainage layer, and from grain-size analysis of soils from the source areas. Values selected for the simulations are shown in Table 2.

The hydraulic conductivity is used to compute the overall speed of groundwater flow in the soil. The speed of groundwater flow through the pore spaces between soil particles also requires a measure of the amount of pore spaces. This parameter is the total porosity of the soil. Porosity values were taken from the work by Pacific Groundwater Group (2001) and are shown in Table 2.

In addition to hydraulic conductivity, there are parameters associated with unsaturated flow. The VS2DT code uses the widely accepted van Genuchten method for quantifying the effect of variable saturation conditions on groundwater flow (van Genuchten, 1980). This introduces two parameters for each material type, and these are denoted simply as  $\alpha$  and  $\beta$ . The van Genuchten parameters for the general embankment fill were taken from previous work by Pacific Groundwater Group (2001). The van Genuchten parameters for the drainage layer were taken from values provided in the VS2DT documentation for an unconsolidated sand (Lappala *et al.*, 1987). Although the drainage layer is not entirely sand, the sand and finer particles are assumed to dominate the flow characteristics of the drainage layer. This assumption is consistent with well established principles of groundwater flow (Fetter, 1994). The van Genuchten parameters for the drainage layer and general embankment fill material are shown in Table 2.

Finally, there are two parameters that relate to the ability of the soil to hold moisture. These parameters are the specific storage and the residual moisture content. The residual moisture content is the small amount of moisture trapped between soil particles after the water has been drained from the soil. Specific storage is the change in water stored in pore spaces due to the compression or expansion of the aquifer. It is a significant parameter only in thick, saturated aquifers. Since the fill is largely unsaturated and specific storage is not important in this case, the specific storage was set to zero. Residual moisture values were taken from the work by Pacific Groundwater Group (2001) and are provided in Table 2.

## Section 4.0

### Numerical Modeling Analysis

---

The movement of water in the embankment occurs generally at partially saturated conditions as rainwater infiltrates from the ground surface to the groundwater table under the fill. Water under unsaturated conditions moves slowly downward. As it flows through the soil, it picks up some compounds adsorbed to the surfaces of soil particles. These compounds become dissolved in the infiltrating water, but move even more slowly than the water as the compounds may adsorb back onto soil particles.

Simulating the process of infiltration and transport of compounds in the infiltrating water can be performed using a number of computer codes. In this study, the U.S. Geological Survey (USGS) code VS2DT was selected (Lappala *et al.*, 1987; Healy, 1990; Hsieh *et al.*, 2000). The VS2DT code is a well-established, public-domain code supported by the USGS. The VS2DT code uses state-of-the-science methods for the simulation of flow and transport of dissolved compounds in variably saturated soils and is designed for the type of analysis conducted here.

The VS2DT code is applied to a specific problem by configuring the model to the physical setting and by choosing model parameters to represent the soil- and water-quality properties within the physical setting. The configuration of the model and the selection of model parameters are described in the following sections.

#### 4.1 Model Configuration

The VS2DT code supports simulation of flow and transport within a vertical cross-section. Flow and transport are modeled in both the vertical and horizontal direction within the cross-section. The model cross-section is based on the cross-sections shown in Figure 2. The fill material is divided into four types of fill: an 'ultra clean' wedge (drainage layer cover), general embankment fill material above the wedge, a free drainage layer on the face of the embankment, and the drainage layer under the fill. The model section is shown in Figure 3.

The drainage layer is set at the bottom of the model. The assumption is made that all recharge eventually discharges through the drainage layer. In actuality, most of the water infiltrating through the fill leaks through the drainage layer and into the underlying groundwater (Pacific Groundwater Group, 2001). Therefore, the assumption made here is conservative as it results in a faster travel time for the transport of metals, does not account for any loss of flow to groundwater, and does not include dilution by groundwater within the drainage layer or dilution between the embankment and the creeks.

which bulk metals data were determined were chosen for the adsorption analyses. When multiple samples from the same source area showed a significant range in total metals concentrations, preference was given to samples that had the higher metals concentrations, which have the highest potential to leach to groundwater. The analytical results are presented in Attachment B.

The soils show a substantial cation exchange capacity due to the presence of montmorillonite. In addition, iron oxides are present in important quantities as well. Organic carbon is also present at concentrations that could be important in limiting the transport of organic constituent as well. Overall, these results indicate that the soils possess a significant capacity to adsorb metals and organic compounds and that adsorption is likely to be a dominant process in attenuating transport of dissolved compounds through the fill

### **3.2 Synthetic Precipitation Leaching Procedure**

Selected soil samples were also analyzed in a leaching test using the Synthetic Precipitation Leaching Procedure (SPLP). The SPLP test is designed to mimic the leaching of metals from soil to groundwater in contact with the soil. As in the attenuation capacity analyses, samples were selected to include the range of sources under consideration for the embankment fill. When multiple samples from the same source area showed a significant range in concentrations of total metals, preference was given to samples that had the higher metals concentrations, which have the highest potential to leach to groundwater. The results from this analysis are used to develop soil-water partitioning coefficients ( $K_d$ ) for use in the numerical modeling. Results from the SPLP testing are presented in Attachment C.



## **Section 3.0**

### **Data Analysis**

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#### **3.1 Soil Testing**

Soil samples were collected at six of the major fill sources to the Third Runway embankment. These sources represent over 60 percent of the material placed to-date within the embankment and are expected to be significant sources in the future. These sources, which are generally representative of commercial fill sources within the Puget Sound area, include :

- Black River Quarry (Renton)
- Marine View Pit (Tacoma)
- Lincoln and Summit (Bellevue/Renton)
- Lakeland Pit (Sumner)
- CTI Pit No. 3 (Sumner)
- Stoneway/Kent Kangley Pit (Ravensdale)

Over 90 percent of the existing drainage layer that underlies the embankment is comprised of soil from the Stoneway/Kent Kangley Pit. Samples from the six fill sources were analyzed for the constituents listed in the 401 Certification fill criteria as well as a number of other physical and chemical properties. The sampling and analysis were used to provide data in support of parameter estimation for the numerical modeling analysis described later in this report.

In addition to data collected from the six fill sources, historical fill source data were used from the following sources:

- WSDOT First Avenue
- USCOE Hamm Creek
- Black River Quarry

These data were used to evaluate migration of specific constituents from these fill sources.

##### **3.1.1 Chemical Analysis of Soils**

Soil chemical analyses were conducted to determine the concentration of metals and petroleum hydrocarbons in the different fill source areas. The results of these analyses are presented in Attachment B.

##### **3.1.2 Adsorption Capacity**

Selected soil samples were analyzed for iron and aluminum oxide content, clay mineralogy, and total organic carbon content. These analyses are used to estimate the sorption capacity of soils and consequently the ability of soils to attenuate the transport of metals and organics in groundwater. Samples were selected to include the range of sources under consideration for the embankment fill. From each of the source areas, one or more samples for

## **Section 2.0**

### **Embankment Fill Criteria**

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#### **2.1 Soil Criteria**

The applicable fill soil criteria incorporated in the 401 Water Quality Certification are presented in Table 1. The applicable numerical criteria vary from the drainage layer cover and the general embankment fill due to special criteria imposed by Ecology and the U.S. Fish and Wildlife Service on drainage layer cover material. The special criteria are presented in Attachment E of the 401 Water Quality Certification.

#### **2.2 Water-Quality Criteria**

The Washington State Surface Water Standards (WAC 173-201A) are the water-quality criteria used to determine whether groundwater discharge from the embankment to surface water are protective of aquatic resources for the constituents studied in this report. However, WAC 173-201A does not include antimony, barium, beryllium, silver (chronic), or thallium. Recommended thresholds for these metals were derived from the USEPA AQUIRE database (Attachment A). The selected water quality criteria for metals are shown in Table 1. Since WAC 173-201A does not include a standard for petroleum hydrocarbons, the Ecology CLARC II database was used to select water quality criteria for the petroleum hydrocarbons studied in this report. Water quality criteria for organic compounds studied in this report are shown in Table 8.

which compounds may leach from the fill material and be transported to Miller and Walker Creeks. The steps involved in this analysis are:

- presentation of the fill and water-quality criteria to provide a comparison between the results of the analysis and applicable water-quality criteria;
- analysis of data collected from soils and from leaching tests on those soils to develop parameters for the transport analysis; and
- simulation of leaching and groundwater transport within the embankment fill.

The groundwater flow and transport analysis was used for the following:

- prediction of the concentration of metals in water discharging from the embankment, assuming all fill was at the 401 Certification levels;
- prediction of the concentration of chemicals in water discharging from the embankment fill, assuming maximum concentrations from historic fill sources; and
- sensitivity analysis for the most mobile metal, assuming that all the fill was at 5 and 10 times the 401 Certification level.

## **Section 1.0**

### **Introduction**

---

#### **1.1 Background**

The Port of Seattle has proposed construction of a third runway at Seattle-Tacoma International Airport (STIA). The third runway is to be built on fill and is to extend westward from the west side of the existing airport. Precipitation that infiltrates into the third runway fill will drain into the drainage basins of Miller and Walker Creeks. Concerns regarding adverse water-quality impacts resulted in proposed criteria for fill soil. These criteria are designed to prevent water-quality in the creeks from being adversely affected by metals and other compounds that may be in the fill material in quantities that could be transported to the creeks by infiltrating rain water. The criteria have been incorporated into the 401 Water Quality Certification for the third runway project.

The third runway fill extends along 8000 feet of the third runway project area (Figure 1). The main features of the fill design that relate to water quality are a drainage layer of relatively coarse material under the fill and a wedge of 'ultra clean' material sloping back from the embankment face into the fill (also referred to as the drainage layer cover). A typical section through the fill is shown in Figure 2.

#### **1.2 Objective**

A groundwater flow and transport model was developed to determine if fill placed within the Third Runway embankment will be protective of water quality in Miller and Walker Creeks. This model evaluated both:

- Soil already placed within the embankment in accordance with the 1998 and 1999 Ecology fill acceptance criteria; and
- Soil that will be placed within the embankment under the Ecology 401 Certification fill criteria.

Information used in developing this model includes published data, historic fill source sampling data, and more recent test data collected at several fill sources in compliance with the 401 Certification. The recent test data include results for total metals, petroleum hydrocarbons, and several other physical and chemical test parameters. Selected soil samples were analyzed using the Synthetic Precipitation Leaching Procedure (SPLP) in order to determine the fraction of chemicals that may be leached from soils in contact with water. The results of these soil analyses, in combination with historical test data, are used in a numerical model of the third runway embankment fill to predict the concentration of selected chemicals in water discharging from the embankment fill.

#### **1.3 Approach**

The approach implemented for the analysis of the potential transport of metals and other compounds from the embankment fill involves a number of steps to analyze the pathways by

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**Attachment A: Recommended Thresholds for Chemicals with Potential to Leach from Fill Soils**

**Attachment B: Soil Sampling Results**

**Attachment C: SPLP Testing and Development of Site-Specific Partitioning Coefficients**

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**Seattle-Tacoma International Airport  
Third Runway Embankment Fill  
Water-Quality and Transport  
Analysis**

**FINAL**

*Prepared For:*



*Prepared by:*



**S.S. Papadopoulos and Associates, Inc.**  
101 N. Capital Way, Suite 107, Olympia, WA 98501  
Telephone: 360/ 709-9540

**February 15, 2002**

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**AR 002635**



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**Seattle-Tacoma International Airport  
Third Runway Embankment Fill  
Water Quality and Transport Analysis**

**FINAL**



**S.S. PAPADOPULOS & ASSOCIATES, INC.**

**February 15, 2002**

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**AR 002636**

**Witek, Michael P.**

---

**From:** Jason Kelley [jkelley@martenbrown.com]  
**Sent:** Friday, February 15, 2002 6:02 PM  
**To:** Witek, Michael P.  
**Cc:** Tanya Barnett; Josh Lipsky  
**Subject:** FW: Third Runway Modeling Report



Final complete  
report.zip

Hi Mike. Per request of Tanya Barnett, attached please find Mike Riley's report on the fill criteria modeling he conducted.

If you have any questions, please contact our office.

Jason Kelley

**AR 002637**

**EXHIBIT**

**AR 002638**

1 now currently in place? The current one is by the end  
2 of this week.

3 Q. What was the first deadline?

4 A. Oh, probably about two weeks ago.

5 Q. What topics will your report address?

6 A. We will be addressing the site specific data,  
7 interpretation of the site specific data in terms of  
8 the soil, concentration of metals in soils, the results  
9 of leach tests, the partitioning between soils and  
10 groundwater for the metals and then the transport of  
11 the metals by groundwater from the embankment.

12 MR. WITEK: Could you read back for me the  
13 last response.

14 (Reporter read back as requested.)

15 Q. (BY MR. WITEK) How did you evaluate the  
16 transport of metals by groundwater from the embankment?

17 A. We applied a USGS model called VS2D.

18 MR. WITEK: Off the record.

19 (Discussion off the record.)

20 (Recess taken.)

21 Q. (BY MR. WITEK) Mr. Riley, I've got some  
22 documents that we received today, obviously we haven't  
23 had time to review them in detail, but I'd like to ask  
24 you about them.

25 (Deposition Exhibit No. 323 was marked for

1 soil moisture and that sort of thing that are built  
2 into the specs.

3 Q. So what did Mr. Agid do?

4 A. Mr. Agid is again the Port's contact person  
5 on this matter for us.

6 Q. Was Mr. Agid the one who asked you to do the  
7 work that we've described as your evaluation of the  
8 protectiveness of the fill criteria?

9 A. Actually, I think people at Marten Brown  
10 asked us to do that.

11 Q. Do you remember when it was you were asked to  
12 do this work?

13 A. I think it was after the first of the year,  
14 somewhere right around there.

15 Q. Were you asked to prepare a report  
16 summarizing your work?

17 A. Which?

18 Q. In evaluating the protectiveness of the fill  
19 criteria, and you can break that down into subtopics as  
20 you deem appropriate.

21 A. We've been asked to prepare a report on that  
22 work.

23 Q. Were you given a deadline for finalizing this  
24 report?

25 A. Well, the first deadline or the one that's

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FOR THE AIRPORT COMMUNITIES COALITION:

MICHAEL P. WITEK  
Attorney at Law  
Helsell Fetterman  
1325 Fourth Avenue, Suite 1500  
Seattle, Washington 98111-3846

FOR THE DEPARTMENT OF ECOLOGY:

JEFF B. KRAY  
Attorney at Law  
Assistant Attorney General  
2425 Bristol Court SW, 2nd Floor  
P.O. Box 40117  
Olympia, Washington 98504-0117

FOR THE PORT OF SEATTLE:

TANYA BARNETT  
Marten Brown  
421 South Capitol Way, Suite 303  
Olympia, Washington 98501

ALSO PRESENT: ROD THOMPSON

POLLUTION CONTROL HEARINGS BOARD  
FOR THE STATE OF WASHINGTON

1  
2  
3  
4 AIRPORT COMMUNITIES COALITION, )  
5 Appellant, )  
6 vs. ) PCHB No. 01-160  
7 STATE OF WASHINGTON, )  
8 DEPARTMENT OF ECOLOGY; and )  
9 THE PORT OF SEATTLE, )  
10 Respondents. )

11  
12 DEPOSITION UPON ORAL EXAMINATION  
13 OF  
14 MICHAEL J. RILEY, Ph.D.

15  
16 1:16 P.M.  
17 FEBRUARY 12, 2002  
18 1325 FOURTH AVENUE, SUITE 1500  
19 SEATTLE, WASHINGTON  
20  
21  
22

23  
24 CARLA R. WALLAT, CRR, RPR, CCR #WALLACR346BE  
25

**EXHIBIT**

**AR 002643**





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USACE  
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**TRANSMITTAL FORM**

To: Muffy Walker

Date: January 25, 2002

U.S. Army Corps of Engineers

Project Number: 556-2912-001 01 03

Seattle District

Project Name: Port of Seattle

P.O. Box 3755

Seattle, WA 98124

We are transmitting the following materials: 1 copy of Supplemental Information Regarding Wetlands.

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**Comments:**

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Sincerely,

*Jim Kelley*

Jim Kelley

cc: Project File

**AR 002644**



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RECEIVED  
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**TECHNICAL MEMORANDUM**

Date: January 21, 2002  
To: Muffy Walker  
US Army Corps of Engineers-Regulatory Branch  
P.O. Box 3755  
4735 Marginal Way  
Seattle, Washington 98124-2255  
From: Jim Kelley, Ph.D.  
Subject: Port of Seattle- (1996-4-02325) - *Supplemental Information Regarding Wetlands*  
cc: Elizabeth Leavitt

This memorandum provides additional information relating to several wetland issues associated with the Seattle-Tacoma International Airport Master Plan Update projects.

**1. Evaluation of impacts to hydrologically connected wetlands**

The percent loss of hydrologically connected wetlands in the upper watersheds resulting from the implementation of the Seattle-Tacoma International Airport Master Plan Update projects is addressed in this section. The findings of this evaluation are summarized in Table 1.

The data summarized in Table 1 was derived from assessments of wetlands in the project area, as presented in Port of Seattle submittals (including the *Wetland Functional Assessment and Impact Analysis* report, the *Wetland Delineation Report*, and the *Cumulative Impact to Wetlands and Streams* report) and no-going review to address agency and public concerns. Wetlands included in this analysis are listed in Attachment A. Wetlands identified as occurring in the "North End/Headwaters" section occur on Port property (Attachment B, Figures B1 and B2) north of SR 528 or on private property (near Miller Creek and South 144<sup>th</sup> Street in the City of Burien<sup>1</sup>).

<sup>1</sup> The Corps of Engineers brought this wetland to the attention of the Port in September 2001.

**Table 1. Summary of impacts to wetlands and waters of the U.S. located in the upper watersheds<sup>a</sup> of Miller, Walker, and Des Moines Creeks.**

<b>Watershed<sup>b</sup></b>	<b>Total</b>	<b>Impact</b>	<b>Percent Change</b>
Miller Creek	79.1/ 112.8	10.48	-9.3/ -13.2%
with mitigation		7.18	-6.4/ -9.1% <sup>c</sup>
Walker Creek	36.5	0.26	- 0.7%
Des Moines Creek	59.5	1.29	- 2.2%

Notes:

<sup>a</sup>The upper watersheds are as follows: upstream of SR 509 for Miller Creek, upstream of Des Moines Memorial Drive for Walker Creek, and upstream of Borrow Area 1 for Des Moines Creek.

<sup>b</sup>The range for the Miller Creek watershed results from including 33.7 acres of Arbor Lake and Burien Lake. These lacustrine (lake) ecosystems provide many of the physical and ecological functions of wetlands and are also Waters of the State and US. Lake Reba, Tub Lake, and Northwest Ponds are open water (aquatic bed, and unconsolidated bottom) palustrine wetlands that are integrated into much larger wetland ecosystems and are also included in the relevant calculations.

<sup>c</sup>The calculation represents a net impact that accounts for wetland restoration at the Des Moines Way Nursery, Lora Lake, and Wetland A17 sites (3.30 acres). The restoration of 6.6 acres of prior converted cropland to jurisdictional wetland at the Vacca Farm site is not included.

The analysis presented in this summary contradicts analysis prepared by Amanda Azous (see letter of July 6, 2001, page 13) where it is reported that 21 percent of the wetlands connected to or adjacent to Miller Creek would be eliminated by the Master Plan Projects. The discrepancy is in part a result of Ms. Azous' exclusion of the 19 acres of wetland surrounding Tub Lake (this wetland is described on page 1-19 of the *Wetland Functional Assessment and Impact Analysis Report* (Parametrix 2001)). The discrepancy also results from the fact the recently requested additional mitigation restores 3.3 acres of previously filled wetlands that are hydrologically connected to the creek.

Where Ms. Azous and ACC expresses concern over impacts to the Miller Creek estuary and nearby Puget Sound, the wetland impacts to both Miller and Walker Creek watersheds must be combined as the two creeks confluence upstream of the estuary and Puget Sound. For this analysis wetlands and waters of the US total 149.5 acres<sup>2</sup> and a net loss of 7.44 acres (about 5%) of wetlands connected to the creek systems occurs.

**2. Adequacy of Wetland Mitigation provided by the Port of Seattle Master Plan Update**

Various reviewers have stated that mitigation for the Port of Seattle's Master Plan Update Improvements are inconsistent with Federal Guidelines and are below local/regional guidelines and practice. Additional information regarding the Port's mitigation projects that are provided in this section will help you address these issues.

<sup>2</sup> This value underestimates the actual value as it includes only wetlands in the upper watershed and not those downstream of SR 509 and Des Moines Memorial Drive.

First, the table in Attachment C compares the Port's mitigation plan to the Army Corps of Engineers guidelines for Section 404 permits that were recently summarized in RGL 01-1. This comparison shows that the relevant guidelines regarding development mitigation projects and plans for Section 404 permits have been followed.

Second, an analysis of required mitigation for 38 projects in western Washington (Table 2) shows that the Port's mitigation projects provide more total mitigation acres than the average project permitted through the Section 401/404 process (Ecology in Publication 00-06-016, *Washington State Wetland Mitigation Evaluation Study. Phase I Compliance*, see Attachment C).

**Table 2. Comparison of mitigation as proposed in the NRMP to average mitigation required by Ecology in 38 recent 401 Certifications (as reported in Ecology Publication 00-06-016).**

Type	DOE Evaluation (Total)		NRMP (Total)		NRMP (On-site)	
	Acres	Ratio	Acres	Ratio	Acres	Ratio
(Wetland Impacts)	94.19	-	20.42	-	20.30	-
Total Mitigation	561.16	1:6	178.13	1:8.7	112.75	1:5.5
Creation	41.05	1:0.4	29.98	1:1.5	0	0
Restoration	29.1	1:0.3	11.95	1:0.6	11.95	1:0.6
Enhancement	196.9	1:2.1	41.82	1:2.0	22.32	1:1.1
Preservation	253.03	1:2.7	2.35	1:0.1	2.35	1:0.1
Buffer/Upland	41.08	1:0.4	92.03	1:4.5	76.13	1:3.8

The Port's mitigation ratio (expressed as acres of impact to acres of mitigation) is 1:8.7. It includes creation, restoration (restoration-re-establishment and restoration rehabilitation per RGL 01-1 definitions), enhancement, preservation, and buffers. These mitigation elements are commonly required of applicants to mitigate for wetland impacts. According to the data, the Port's mitigation plan provides more wetland creation, more wetland restoration, and more wetland buffers than the overall average of all mitigation projects. The Port's commitment provides about the same amount of wetland enhancement but less wetland preservation than the typical project. Overall, the amount of mitigation provided by the Port is over 55 acres (45 percent) more than the typical project has provided.

Finally, while reviewers have been critical of the Port's incorporation of wetland preservation and wetland/stream buffers into an ecologically sound mitigation plan, the Washington State Draft Rule (Chapter 173-700 WAC-*Wetland Mitigation Banks*, Attachment E), in addition to RGL 01-1, indicate that these are sound mitigation techniques.

### 3. The National List of Plant Species That Occur in Wetlands

In materials submitted to the Army Corps of Engineers by Ms. Dyanne Sheldon, on behalf of the ACC (see *Declaration of Dyanne Sheldon in Support of Sur-Reply on ACC's motion for Stay*, October 10, 2001), identifies concerns over the use of the Wetland Indicator Status (WIS) and vegetation sampling as a measure of indirect impacts to wetlands that are located adjacent to the third runway embankment. Specifically, Ms

Sheldon identifies that the WIS list was developed in the mid-1980's and is a collective "best guess of a small cadre of botanists" and was not developed by wetland ecologists.

Since the original WIS list was published in 1988, considerable local and national expertise has developed with regard to wetland ecology, wetland plants, and wetland vegetation. This expertise has been applied to generate revisions of the 1988 WIS list. The current WIS list reflects the field experience of numerous local experts, including wetland ecologists. The local Region 9 revisions and review process are documented in the attached Corps Public Notice:

US Army Corps of Engineers, Seattle District. 1994. *1993 Supplement to National List of Plant Species that Occur in Wetlands: Northwest (Region 9)*. Special Informational Public Notice. 31 March 1994. (Attachment F).

The national list and WIS list revision process is discussed in the attached (Attachment G) introduction to:

Reed, P. 1997. *Revision of the National List of Plant Species that Occur in Wetlands*. US Fish and Wildlife Service, Washington, D.C. (Attachment B).

#### **4. Effects of Recently Placed Embankment Fill on Wetland Hydrology**

In materials submitted to the Army Corps of Engineers by ACC (see *Declaration of Amanda Azous in Support of ACC's Motion for Stay*, October 8, 2001 and *Declaration of Amanda Azous in Support of Sur-Reply on ACC's motion for Stay*, October 10, 2001), Ms Azous claims that construction activities have altered the hydrology of wetlands, such that they are becoming increasingly dry. She states that as a result of recent construction "many wetlands are substantially drier than they were in 1994...because the Port has altered the area contributing runoff to many wetlands by stockpiling fill in their watersheds<sup>3</sup> and by clearing forestlands" (see paragraph 19, page 9 of the 10 October 2001 declaration). As explained in this section, Ms. Azous has compared unrelated observations of wetland conditions, and her conclusions are thus not correct.

Ms Azous evaluated observations of Wetland 18 and 37 made in 1994 and originally reported in the *Jurisdictional Wetland Determination for Seattle-Tacoma International Airport Master Plan Update* (Shapiro and Associates 1995). Ms. Azous compares these observations to data collected during 2000 and 2001 reported to the ACOE and Ecology in June 2001 (also contained in Appendix L of the *Natural Resources Mitigation Plan* (Parametrix, November 2001). The comparison of this data is not valid because the observations were made at different locations and elevations.

In 1994, the Port and its consultants did not have access to property west of 12 Avenue West. In 1994, by necessity, hydrologic measurements in wetlands were thus limited to the areas on the east side of 12th Avenue South. Limited visual observations were made west of 12<sup>th</sup> Avenue south from the street itself.

The 1994 observations of hydrology represent conditions in the drainage ditches and swales along 12<sup>th</sup> Avenue South (referred to as Water A and portions of Water W the NRMP and other documents).

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<sup>3</sup> The hydrologic effect of fill placement in wetlands is not addressed here as repeated analysis completed by the Port for Ecology has shown the hydrologic benefits of fill to downslope wetlands.

Observations were also made in the east portion of Wetland 18. The approximate elevations of these locations accessible to the Port in 1994 are as follows:

<u>Location</u>	<u>Elevation</u>
Wetland 18 at 12 <sup>th</sup> Avenue South	280 feet
Wetland 19 at 12 <sup>th</sup> Avenue South	268 feet
Water A-at Wetland 19	268 feet
Water W and Water A at Wetland 37	256 feet

Ms Azous compares these observations to observations made in later years from different locations, i.e. monitoring wells located west of 12<sup>th</sup> Avenue south and west of the project footprint. She compares observations that are located some 20 -50 feet lower in elevation. Here comparison also includes areas that are subjected to channelized flow (1994) to areas located outside of channels (2000 and 2001). In addition to the differences in elevations, the more recently sampled locations range between 420 to over 900 feet west of the 1994 elevations. These approximate elevations and distances are as follows:

<u>2001 Well Locations</u>	<u>Elevation</u>	<u>Distance from 1994 point</u>
Well 18-1	232.8 feet	920 feet
Well 18-2	227.4 feet	780 feet
Well 37-1	224 feet	750 feet
Well 37-2	222 feet	420 feet
Well 37-3	222.7 feet	700 feet

The natural and constructed drainage and topographic patterns that control water flow from the upslope areas on the east side of 12<sup>th</sup> Avenue are such that surface and shallow groundwater observed there would not be distributed to the well locations selected by the ACOE for long term monitoring. This condition prevents a valid comparison of the observation sets.

Clearing of forest vegetation is also claimed to be a factor causing a reduced hydrology to wetlands. Hydrology literature and models indicate that rain interception and evapotranspiration from forests reduces the amount of water available to recharge ground and surface water. Literature indicates that the clearing of forest vegetation generally increases groundwater recharge and runoff. For example, research in forests of the in the Puget Sound lowlands shows that the annual interception and transpiration by mixed forest vegetation can be 8 inches (40 percent) higher than that measured in pasture vegetation.<sup>4</sup> Thus, the assumption that clearing forests reduces the amount of water available to wetlands located in downslope areas is unsupported by the literature.

<sup>4</sup> Bauer, H. and M. Mastin. 1997. *Recharge from precipitation in three small glacial-till mantled catchments in the Puget Sound lowland, Washington*. US Geological Survey Water-Resource Investigations Report 96-4219. Tacoma, Washington.

**Attachment A**

**WETLANDS IN THE UPPER WATERSHEDS OF MILLER WALKER, AND DES MOINES  
CREEKS**

**Attachment A - Wetlands in the Upper Watersheds of Miller, Walker, and Des Moines Creeks.**

Wetland	Watershed	Hydrology	Classification		Wetland Area	
			HGM	USFWS	Existing	Impact
<b>North End/Headwaters</b>						
Arbor Lake	MC	Connected	L	OW	3.70	
Lake Burien	MC	Connected	L	OW	30.00	
S. 144th	MC	Connected	R	SS/EM	2.00	
N1	MC	Isolated	D	S	0.14	
N2	MC	Connected	D	F	0.72	
N3	MC	Connected	D	F/ E/ SS/ OW	19.21	
N4	MC	Isolated	D	E	0.68	
N5	MC	Isolated	D	S	0.38	
N6	MC	Isolated	D	E	0.00	
N7	MC	Connected	S	F	0.33	
N8, N9, N10	MC	Connected	S	E/ F	0.86	
N11	MC	Isolated	D	F	0.26	
N12	MC	Isolated	D	F	0.28	
N13	MC	Isolated	D	F	0.26	
N14	MC	Isolated	D	F	0.65	
L1	MC	Isolated	D	S	0.05	
				<b>Subtotal</b>	<b>59.52</b>	
<b>North Employee Parking Lot Area</b>						
1	MC	Isolated	S	F	0.07	
2	MC	Connected	S	F	0.73	
				<b>Subtotal</b>	<b>0.80</b>	
<b>Runway Safety Area Extension</b>						
3	MC	Connected	S	F	0.56	
4	MC	Connected	S	F	5.00	0.14
5	MC	Connected	S	F/SS	4.63	
6	MC	Connected	D	SS	0.86	
				<b>Subtotal</b>	<b>11.05</b>	
<b>Third Runway Project Area</b>						
<b>North Airfield</b>						
7	MC	Connected	D	F/OW/E	6.68	
8	MC	Connected	D	SS/E	4.95	
9	MC	Connected	S	F/ E	2.83	0.03
10	MC	Connected	S	SS	0.31	
11	MC	Connected	S	F/E	0.50	0.50
12	MC	Connected	S	F/E	0.21	0.21
13	MC	Connected	S	E	0.05	0.05
14	MC	Isolated	S	F	0.19	0.19
<b>West Airfield</b>						
15	MC	Connected	S	E	0.28	0.28
16	MC	Isolated	D	E	0.05	0.05
17	MC	Isolated	D	E	0.02	0.02
18	MC	Connected	S	F/SS/E	3.56	2.84
19	MC	Connected	S	F	0.56	0.56
20	MC	Connected	S	SS/E	0.57	0.57
21	MC	Connected	S	F	0.22	0.22
22	MC	Connected	S	SS/E	0.06	0.06
23	WC	Isolated	D	E	0.77	0.77



**Attachment A - Wetlands in the Upper Watersheds of Miller, Walker, and Des Moines Creeks.**

Wetland	Watershed	Classification			Wetland Area	
		Hydrology	HGM	USFWS	Existing	Impact
24	WC	Isolated	D	E	0.14	0.14
25	WC	Isolated	D	F	0.06	0.06
26	WC	Isolated	D	E	0.02	0.02
W1	MC	Isolated	D	E	0.10	0.10
W2	MC	Isolated	D	F/E	0.22	0.22
	MC	Connected	CH		0.02	
<b>Vacca Farm Site</b>						
FW1	MC	Connected	D,R	FW	0.03	
FW2	MC	Connected	D,R	FW	0.09	
FW3	MC	Connected	D,R	FW	0.59	
FW5	MC	Connected	D,R	FW	0.08	0.15
FW6	MC	Connected	D,R	FW	0.07	
FW8	MC	Connected	D,R	FW	0.03	
FW9	MC	Connected	D	FW	0.01	
FW10	MC	Connected	D,R	FW	0.02	
FW11	MC	Connected	D	FW	0.11	
A1a	MC	Connected	S	SS	0.07	
	MC	Connected	CH		0.02	
<b>West Acquisition Area</b>						
35	MC	Connected	S	F/E	0.67	0.67
37	MC	Connected	S	F/E	5.73	4.09
39	MC	Connected	S	F/SS/E	0.90	
40	MC	Isolated	D	SS	0.03	0.03
41	MC	Isolated	D	E/OW	0.44	0.44
43	WC	Connected	D	F/SS/E	33.43	
44	WC	Connected	S	F/SS	3.08	0.26
A1	MC	Connected	D, R	F/SS/E	4.59	0.59
A2	MC	Connected	D,R	SS	0.05	
A3	MC	Connected	D,R	SS	0.01	
A4	MC	Connected	D,R	SS	0.03	
A5	MC	Isolated	D	E	0.03	0.03
A6	MC	Isolated	S	F	0.16	0.16
A7	MC	Isolated	S	F	0.30	0.30
A8	MC	Isolated	S	F/SS	0.38	0.38
A9	MC	Isolated	S	SS	0.04	
A10	MC	Isolated	S	SS	0.01	
A11	MC	Isolated	S	SS	0.02	
A12	MC	Isolated	S	SS	0.11	0.08
A13	MC	Isolated	S	F	0.12	
A14	MC	Connected	S	F/SS/E	0.19	
A15	MC	Isolated	D	E	0.04	
A16	MC	Isolated	D	SS/E	0.09	
A17	MC	Connected	S	F/SS/E	2.66	
A18	MC	Isolated	D	SS	0.01	0.01
A19	MC	Isolated	D	E	0.04	
Lora Lake	MC	Connected	L	OW	3.06	
	MC	Connected	CH		0.33	
<b>Riparian Wetlands</b>						
R1	MC	Connected	R	E	0.17	0.13
R2	MC	Connected	R	SS/E	0.12	

**Attachment A - Wetlands in the Upper Watersheds of Miller, Walker, and Des Moines Creeks.**

Wetland	Watershed	Classification			Wetland Area	
		Hydrology	HGM	USFWS	Existing	Impact
R3	MC	Connected	R	SS	0.02	
R4	MC	Connected	R	E	0.11	
R4b	MC	Connected	R	F/E	0.11	
R5	MC	Connected	R	E	0.05	
R5b	MC	Connected	R	F/E	0.07	
R6	MC	Connected	R	F/E	0.21	
R6b	MC	Connected	R	E	0.09	
R7	MC	Connected	R	F/E	0.04	
R7a	MC	Connected	R	E	0.04	
R8	MC	Connected	R	SS/E	0.40	
R9	MC	Connected	R	F	0.38	
R9a	MC	Connected	R	F/SS/E	0.74	
R10	MC	Connected	R	SS	0.04	
R11	MC	Connected	R	E	0.42	
R12	MC	Connected	R	F	0.03	
R13	MC	Connected	R	E	0.12	
R14a	MC	Connected	R	SS/E	0.13	
R14b	MC	Connected	R	E	0.08	
R15a	MC	Connected	R	F/SS/E	0.79	
R15b	MC	Connected	R	F/E	0.25	
R17	MC	Connected	R	F	0.31	
				<b>Subtotal</b>	<b>84.76</b>	
<b>Borrow Area 1</b>						
32	DMC	Isolated	D	E	0.09	
48	DMC	Isolated	S	F/E	1.58	
B1	DMC	Isolated	D	F/SS	0.27	
B4	DMC	Connected	S	SS	0.07	
B11	DMC	Isolated	D	E	0.18	
B12	DMC	Connected	D	SS	0.63	0.18
B13	DMC	Connected	S	F	0.33	
B14	DMC	Isolated	D	SS/E	0.78	0.07
B15	DMC	Isolated	D	SS	2.05	0.78
	DMC	Isolated	CH		0.01	
				<b>Subtotal</b>	<b>5.99</b>	
<b>Borrow Area 3</b>						
29	DMC	Isolated	D	F	0.74	
30	DMC	Isolated	D	F/SS	0.88	
B5	DMC	Isolated	D	F/SS	0.08	
B6	DMC	Isolated	D	F/SS	0.55	
B7	DMC	Isolated	D	F/SS	0.03	
B9	DMC	Isolated	S	F	0.05	
B10	DMC	Isolated	S	F	0.02	
51	DMC	Connected	D,R	F	16.23	
				<b>Subtotal</b>	<b>18.58</b>	
<b>South Aviation Support Area (SASA)/Tyee Valley Golf Course</b>						
28	DMC	Connected	D, R	SS/E/OW	35.45	0.07
52	DMC	Connected	D, R	F/SS/E	4.70	0.54
53	DMC	Isolated	S	F	0.60	0.60
G1	DMC	Isolated	S	E	0.05	0.05

**Attachment A - Wetlands in the Upper Watersheds of Miller, Walker, and Des Moines Creeks.**

Wetland	Watershed	Classification			Wetland Area	
		Hydrology	HGM	USFWS	Existing	Impact
G2	DMC	Isolated	S	E	0.02	0.02
G3	DMC	Connected	S	E	0.06	0.06
G4	DMC	Isolated	S	E	0.04	0.04
G5	DMC	Isolated	S	E	0.87	0.87
G6	DMC	Isolated	D	E	0.01	
G7	DMC	Connected	S	F/SS	0.50	0.50
G8	DMC	Connected	S	E	0.04	
WH	DMC	Connected	D	OW	0.25	
DMC	DMC	Connected	D, R	F/SS/E	1.08	
				<b>Subtotal</b>	<b>43.67</b>	
<b>Industrial Waste System (IWS) Area</b>						
IWS	DMC	Isolated	S	F	0.67	
<b>South Aviation Support Area - Detention Pond</b>						
E1	DMC	Isolated	D	F	0.23	
E2	DMC	Isolated	D	F	0.04	0.04
E3	DMC	Isolated	D	F	0.06	0.06
				<b>Subtotal</b>	<b>0.33</b>	
<b>Other (SR 509 EIS)</b>						
B	DMC	Isolated	D	F/SS/E	6.60	
C	DMC	Connected	D	SS	0.10	
M	DMC	Connected	D	SS	0.10	
				<b>Subtotal</b>	<b>6.80</b>	

**Abbreviations:**

Basins

MC = Miller Creek  
 WC = Walker Creek  
 DMC = Des Moines Creek

Hydrology

*Connected* - channel or short culvert connection to a stream, or riparian  
*Isolated* - no connection to a stream or long culvert connection (>1,000 ft) to a stream

HGM Classification

D - Depression  
 S - Slope  
 R - Riparian setting  
 CH - drainage channel

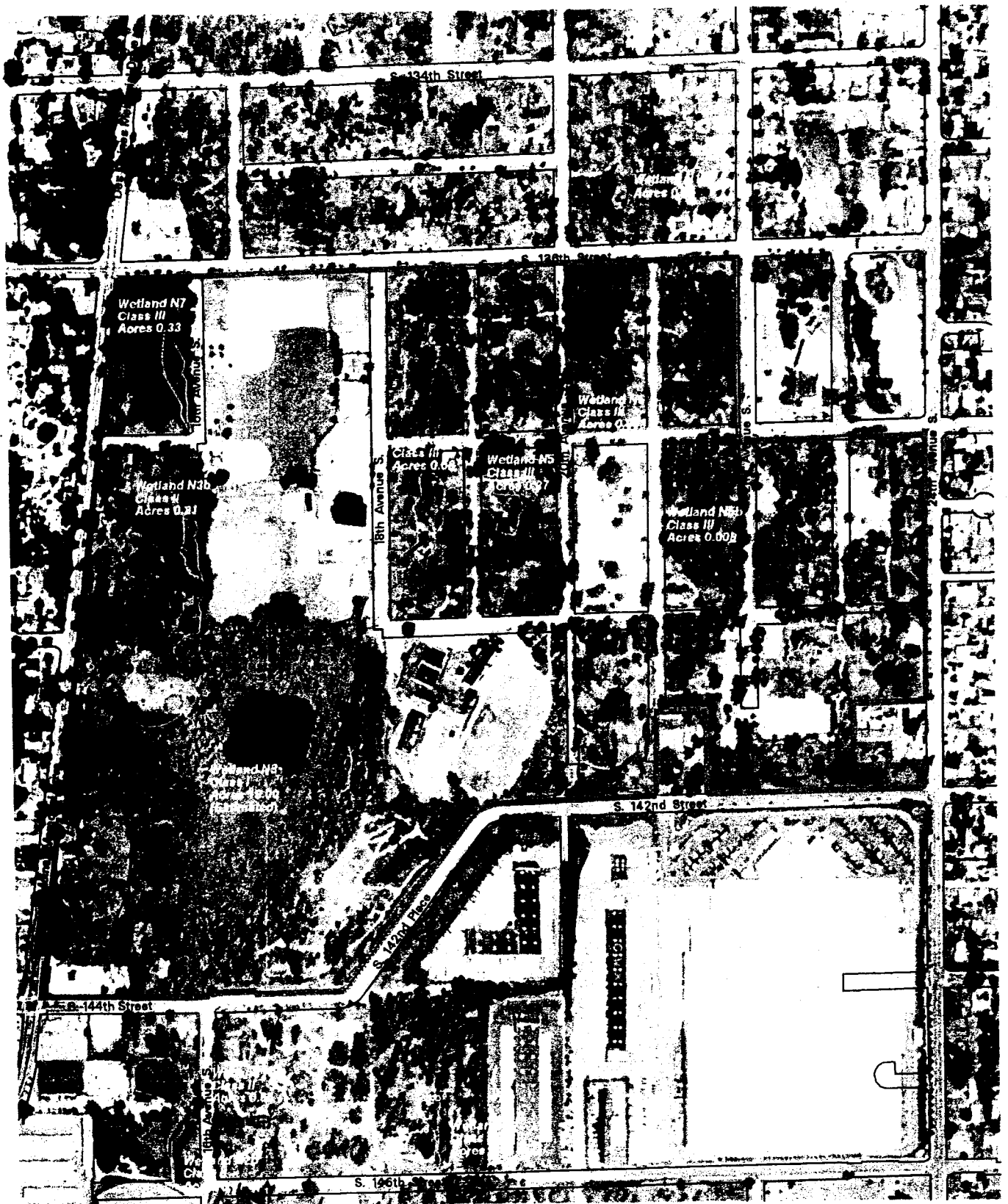
Cowardin Classification

F- Palustrine Forested  
 SS - Palustrine Scrub-Shrub  
 E - Palustrine Emergent  
 OW- Palustrine Open Water

**Attachment B**

**WETLANDS ON SEATTLE-TACOMA INTERNATIONAL AIRPORT NORTH END  
PROPERTIES**

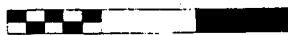
**AR 002655**



Prepared by Parametrix, Inc. File: seatac2/plotamh2001/plots/p\_1210-northwet-3sheets-1.gra Date: January 11, 2002



0 250 500 750



Scale in Feet

- Basemap
- Surveied Wetland
- Estimated Wetland
- Boundary of Study Area

**Figure B1**  
**Wetlands within**  
**50 Acre Parcel**  
**Seattle - Tacoma**  
**International Airport**

AR 002656



Prepared by Parametrix, Inc. File: seatac2/plotamls2001/plots/p\_1210-northwet-3sheets-n.gra Date: December 12, 2001



0 350 700



Scale in Feet

- Basemap
- Estimated Wetland
- Boundary of Study Area

**Figure B2**  
**Estimated Wetlands**  
**within North SeaTac Park**  
**Seattle - Tacoma**  
**International Airport**

**AR 002657**

Attachment C

COMPARISON OF MASTER PLAN UPDATE MITIGATION TO RGL 01-1 GUIDELINES

And

REGULATORY GUIDANCE LETTER 01-1

**Analysis of RGL 01-1 to the Natural Resources Mitigation Plan  
Master Plan Update Improvements  
Seattle –Tacoma International Airport**

As discussed in the National Research Council (NRC) report, *Compensating for Wetland Losses Under the Clean Water Act*, (June, 2001), the Corps must increase the effectiveness and compliance of mitigation required for authorized impacts to the aquatic environment, including wetlands. *Regulatory Guidance Letter (RGL) 01-1* provides direction concerning factors that affect compensatory mitigation success in a variety of contexts. This guidance adopts definitions that were developed for use in accounting for the types of mitigation used in Federal efforts to meet the national no overall net loss policy and to account for projects designed solely to increase the nation's wetland base.

The table below compares the Port of Seattle's mitigation proposal to the guidance and analysis approaches recommended in RGL 01-1.

Item	RGL 01-1 Guidance	Project Analysis
1	<p><b>2. General Considerations.</b> All mitigation required by the Corps should be based on a consideration of regional aquatic resource requirements. Districts should take an ecosystem approach to the formulation of compensatory mitigation projects considering the resource needs of immediate and nearby watersheds. Mitigation that includes a mix of habitats such as open water (e.g., streams) as well as wetlands and adjacent uplands is normally more ecologically sustainable.</p>	<p>Port has examined watershed conditions and cumulative impacts to wetlands and streams in the project area. The planning of mitigation needs and selection of stream and wetland restoration sites has been based on a consideration of these impacts.</p> <p>A cumulative impact report shows that many wetland areas in the watersheds have been affected by agricultural, residential, and commercial development. The mitigation plan for wetlands focuses on restoring natural wetland condition and functions to these wetlands. The plan focuses on riparian wetlands because these wetlands were historically most prominent and are most important to supporting the aquatic habitat of the creek systems. Mitigation has also focused on restoring and enhancing riparian buffers, as the ecological conditions of these important habitats have also been reduced or eliminated by past development.</p> <p>Stormwater management has been planned to restore predevelopment runoff conditions from much of the project area. Stormwater management mitigation includes construction of new stormwater management facilities to serve new development as well as facilities to serve previously developed airport areas (i.e. retrofitting). The stormwater management standards reduce peak storm flows in Miller, Walker, and Des Moines Creeks, which have degraded fish habitat, and are a result of cumulative impacts.</p>



2	<p><b>a. Debit/Credit assessment.</b> The evaluation of adverse effects should be undertaken with a view toward being able to assign an identified debit to be offset by a credit. The method for assessing debits should be comparable to the method used for assigning credits. Corps regulatory program project managers are responsible for using district-approved methods (e.g., the Hydrogeomorphic Approach or acre-for-acre ratios) for assessing and assigning credits or debits in terms of amount, type and location. The definitions for "debit" and "credit" are provided (see attached definitions document).</p>	<p>The evaluation of adverse effects has used a debit/credit approach based on acres; the credit derived from mitigation was discounted to reflect qualitative evaluations of its functional value relative to existing conditions and at the mitigation site and in the wetlands impacted.</p> <p>Qualitative assessments of wetland functions at impact and mitigation sites have been made and are reported in the <i>Wetland Functional Assessment and Impact Analysis</i> report.</p>
3	<p><b>b. Role of preservation.</b> Credit may be given when existing wetlands and/or other aquatic resources are preserved (protected/maintained) in conjunction with establishment, restoration, rehabilitation, and enhancement activities and when it is demonstrated that the preservation will augment the functions of the established, restored, rehabilitated or enhanced aquatic resource. Such augmentation may be reflected in the amount of credit attributed to the entire mitigation project. In addition, the permanent preservation of existing wetlands and/or other aquatic resources may be authorized as the sole basis for generating credits in mitigation projects. In either case, consideration must be given to whether wetlands and/or other aquatic resources proposed for preservation perform physical, chemical and/or biological functions, the preservation of which is important to the region in which the mitigation site will be located. Aquatic areas, including wetlands, that are preserved as mitigation should also be under some documented level of threat for development, which is the case for most privately held wetlands or other aquatic areas.</p>	<p>Wetlands located near Borrow Area 3 are placed in restrictive covenants to preserve existing wetlands the portion of their upslope watersheds located on Port Property.</p> <p>One of these wetlands (Wetland 30) is unique in the project area, as it is a seasonally inundated depression that provides breeding habitat for amphibians. The seasonal flooding found in this wetland would allow some amphibian species to reproduce in the wetland without potential predation from bullfrog (a non-native species) that typically inhabit areas of permanent inundation (such as that found at the Northwest Ponds and Lora Lake systems).</p>
4	<p><b>c. Inclusion of upland areas.</b> Credit may be given for the inclusion of upland areas occurring within a compensatory mitigation project to the degree that the protection and management of such upland areas is an enhancement of aquatic functions and increases the overall ecological</p>	<p>Upland areas are included in mitigation sites as riparian buffers, wetland buffers, and buffer averaging areas. These areas are enhanced to improve the aquatic habitat functions of the creek systems and the overall functions of nearby wetlands. Buffer averaging areas have been planned, to the degree feasible, where existing forest vegetation can be preserved adjacent to other mitigation areas.</p>

5	<p>functioning of the mitigation project (e.g., vegetated buffers or a mix of habitats).</p> <p><b>d. Vegetated buffers.</b> Compensatory mitigation plans for projects in or near streams or other open waters should normally include a requirement for the establishment and maintenance of vegetated buffers next to open waters on the project site. In many cases, vegetated buffers will be the only compensatory mitigation required and may be wetland, upland or a composite mix of the two. Vegetated buffers should normally consist of native species. The width of the vegetated buffers should be determined based on documented water quality or aquatic habitat loss concerns. Vegetated buffers need not be required to be as wide as some technical literature would suggest since the literature addresses the pre-human colonization of North America. Normally, vegetated buffers will be 50 feet wide or less on each side of a stream or other open water area. All vegetated buffers should be designed to provide water quality or aquatic habitat functions (e.g., shading, habitat for animals that require aquatic and adjacent upland areas as habitat) and ecological value.</p>	<p>Upland buffers are included in mitigation sites. These areas are enhanced to improve the aquatic habitat functions of the creek systems and the overall functions of nearby wetlands. To the extent practicable, vegetated buffers have been established along streams and ponds located adjacent to the airport. Enhancement plantings in buffers are with native plant species that are adapted to the various environmental conditions on the sites.</p> <p>The widths of the vegetated buffers are based evaluations of technical literature relating to the protection of wetland and stream functions. The width of these buffers has considered the improvements above the degraded (i.e. removal of stormwater inputs, human uses, and vegetation management) baseline conditions that they provide, as well as the long-term protection requirements.</p> <p>The stream buffers typically exceed 100 feet on each side of stream. Buffers are designed to provide water quality and aquatic habitat functions (e.g., shading, and habitat for animals that require aquatic). Establishment of the buffers removes existing factors that degrade aquatic habitat, including human habitation, untreated stormwater discharges, failing septic systems, golf course greens, farming, and vegetation management.</p>
6	<p><b>e. Use of in-kind vs. out-of-kind mitigation.</b> In the interest of achieving functional replacement, in-kind compensation of aquatic resource impacts will often be appropriate. However, because compensatory mitigation decisions should take into account the functions of the aquatic environment, including wetlands, within both the landscape mosaic as well as a watershed context, out-of-kind compensation may also be appropriate. Out-of-kind compensation should be practicable and environmentally equal or preferable to in-kind compensation (i.e., of equal or greater ecological value to a particular region). However, non-tidal aquatic areas including wetlands should typically not be used to compensate for the loss or degradation of tidal aquatic areas including wetlands, nor should the reverse be true. Decisions to require or allow out-of-kind mitigation are made on a case-by-case basis</p>	<p>Generally mitigation for impacts to wetland functions is on-site and in-kind. The functions of forest and shrub dominated wetlands are replaced on-site and in-kind as explained in Section 4 of the NRMP. In the watershed context, this mitigation improves the functioning of riparian wetlands and upland riparian areas along Miller and Des Moines Creeks. The mitigation sites would thus improve the aquatic habitats of the creek above the baseline condition where human use has eliminated much of its ecological value.</p> <p>Some impacts occur to emergent wetlands that are also lawn, agricultural land, or golf course greens. These systems are not replaced in-kind with other grass dominated emergent plant communities. Rather they are replaced by restoring natural shrub and forest communities to filled or degraded wetlands. This approach allows for the establishment of sustainable plant communities that provide greater ecological value than the emergent wetlands impacted.</p>

<p>during the permit evaluation process and should also consider the location (e.g., surrounding land uses). Such decisions are usually based on the amount of debits assigned to the impact site in comparison to the credits assigned to the compensatory action (e.g., loss of a degraded site associated with the restoration of a particularly vulnerable or valuable aquatic habitat type).</p>	<p>Off-site mitigation also provides emergent habitats that are "out of kind" compared to the impacted emergent wetlands. The off-site emergent habitat will be planted with native emergent plant species rather than the non-native grass species typical of the impact area. This approach allows for the establishment of sustainable plant communities that provide greater ecological value than the degraded wetlands to be filled.</p> <p>The "out-of-kind" mitigation is environmentally preferable to in-kind compensation because it provides wetlands and riparian functions of equal or greater ecological value to the watersheds. The off-site mitigation in Auburn provides habitat functions that are greater than those impacted by the project because of the increased diversity of habitats provided, their protection from human disturbance, and their greater size. These habitats will support a greater diversity of wildlife to the region than occurs in the existing wetlands or could be accomplished on-site due to concerns over aircraft safety.</p> <p>The functional assessment methodology is explained in the <i>Wetland Impact and Functional Assessment Report</i>. This analysis qualitatively evaluates wetland functions by evaluating the attributes of wetlands that are commonly used to predict wetland function in the PNW and Washington State.</p> <p>The mitigation for the project is based on the acres of wetland impacted and the functional attributes provided by the mitigation. Other factors affecting the amount of mitigation includes the temporal losses between the time of impact and the time the mitigation site achieves a fully functional level and the likelihood of mitigation success.</p>
<p><b>f. Mitigation ratios.</b> The Corps regulatory program allows for the use of ratios in determining the amount of compensation required when there is a difference between the kind of aquatic resource being impacted and the kind of mitigation being required. Ratios must be based on an identifiable rationale (e.g., use of an assessment methodology, rationale based on a regional aquatic resource context, or a case-by-case rationale briefly described in the decision document). Other factors affecting mitigation ratios include temporal losses between the time of impact and the time the mitigation site achieves a fully functional level and the likelihood of mitigation success. All use of ratios should be to ensure that the underlying policy of offsetting the authorized impacts will occur.</p>	<p>Mitigation credits are assigned to various actions as listed in Table 4.1-3 of the NRMMP. The following types of compensatory mitigation are included in the mitigation plan:</p> <p><b>Establishment</b> – occurs at Auburn where upland areas are converted to wetland.</p> <p><b>Restoration - re-establishment</b> – occurs at Auburn where wetlands are restored to areas that were historically wetland; occurs at Lora Lake where fill is removed from historic wetlands; occurs at the Nursery site where fill is removed from historic wetlands.</p> <p><b>Restoration-rehabilitation</b> – Occurs at all mitigation sites where physical and biological</p>
<p><b>g. Types of compensatory mitigation.</b> The types of mitigation projects used in compensating for the loss of aquatic resources including wetland impacts are listed below. A definition for each type of compensatory mitigation project is provided in the attached definitions document. The current view is that restoration efforts provide the best potential for success in terms of providing functional compensation; however, each type of mitigation has utility and may be used</p>	<p>Mitigation credits are assigned to various actions as listed in Table 4.1-3 of the NRMMP. The following types of compensatory mitigation are included in the mitigation plan:</p> <p><b>Establishment</b> – occurs at Auburn where upland areas are converted to wetland.</p> <p><b>Restoration - re-establishment</b> – occurs at Auburn where wetlands are restored to areas that were historically wetland; occurs at Lora Lake where fill is removed from historic wetlands; occurs at the Nursery site where fill is removed from historic wetlands.</p> <p><b>Restoration-rehabilitation</b> – Occurs at all mitigation sites where physical and biological</p>

<p>as compensatory mitigation. When assigning credit for a particular type or mix of mitigation types within a mitigation project, the credit for the entire mitigation project should be compared to the debit(s) formulated for the impact(s) being authorized.</p> <ol style="list-style-type: none"> <li>1. Establishment</li> <li>2. Restoration (includes re-establishment and rehabilitation)</li> <li>3. Enhancement</li> <li>4. Protection/Maintenance.</li> </ol>	<p>conditions are manipulated to return natural and historic wetland functions to degraded areas.</p> <p><b>Enhancement</b> – occurs in portions of the Miller Creek Buffer where in-fill plantings are added to improve wetlands that already contain some forest and shrub habitat.</p> <p><b>Protection/Maintenance</b> – occurs at Borrow Are 3.</p> <p>The mitigation credit ratios listed in Table 4.1-3 reflect the varying levels of functional lift that will result from the various mitigation actions. The mitigation credit considers the net gains in wetland functions at the mitigation sites, the quality of the mitigation provided, the rarity of the wetlands in the watersheds, the extent to which degraded functions in the watershed are replaced. For buffers, the credit ratio also considers the contribution buffers provide to the ecological functioning of the site, the adequacy of the area to perform the desired functions, and connectivity to other habitats.</p> <p>The listed requirements for mitigation timing have been met, including:</p> <ol style="list-style-type: none"> <li>(1) The mitigation plans have been reviewed and approved;</li> <li>(2) The mitigation project site have been secured;</li> <li>(3) Adequate ground and/or surface water is available on the sites; and</li> <li>(4) The appropriate financial assurances have been established.</li> </ol> <p>Construction of the mitigation projects is variable but most in-basin mitigation will be implemented in advance of or within the first full growing season following the filling of wetlands.</p> <p>The removal of homes and human impacts from the runway acquisition area implements a substantial part of the Miller Creek Buffer mitigation project, and this occurs prior to filling of wetlands. Other mitigation that occurs prior to the filling of wetlands is the abandonment of farming at the Vacca Farm area, elimination of commercial activities from the Des Moines Way Nursery mitigation site, and removal of golfing from the Tyee Valley Golf Course mitigation sites. These actions will begin the process of restoring wetland and biologic functions to the mitigation sites.</p> <p>The restoration of temporary impacts must, by necessity, occur following most of the embankment construction, resulting in a several year delay. For this reason, additional mitigation for temporary impacts has been provided. Regardless, following embankment construction, the sites used for temporary construction (stormwater management) will be restored as described in the NRMF.</p>
<p>7</p> <p><b>h. Timing of mitigation construction.</b> Financial and ecological considerations play important roles in mitigation project development. It is generally appropriate, in cases where there is adequate financial assurance and/or where the likelihood of success of the project is high, to allow an impact to occur before the mitigation plan is implemented. In this regard, the following minimum requirements should normally be satisfied prior to any construction in aquatic areas under an issued permit: (1) the mitigation plans have been approved; (2) the mitigation project site has been secured; (3) a permanent source of adequate water is available; and (4) the appropriate financial assurances have been established. In addition, initial physical and biological improvements should typically be completed no later than the first full growing season following impacts to the aquatic environment by issuance of a permit. If that is not practicable, then additional compensatory mitigation or other measures that reduce the risk of failure should be considered as part of the mitigation plan (e.g., use of a higher mitigation ratio or increased financial assurance). For compensatory mitigation involving in-lieu-fee arrangements or mitigation banking agreements, the guidance applicable to those forms of mitigation must be followed. After-the-fact mitigation may be required where permits are issued in response to emergencies or to resolve an</p>	<p>as compensatory mitigation. When assigning credit for a particular type or mix of mitigation types within a mitigation project, the credit for the entire mitigation project should be compared to the debit(s) formulated for the impact(s) being authorized.</p> <ol style="list-style-type: none"> <li>1. Establishment</li> <li>2. Restoration (includes re-establishment and rehabilitation)</li> <li>3. Enhancement</li> <li>4. Protection/Maintenance.</li> </ol> <p><b>h. Timing of mitigation construction.</b> Financial and ecological considerations play important roles in mitigation project development. It is generally appropriate, in cases where there is adequate financial assurance and/or where the likelihood of success of the project is high, to allow an impact to occur before the mitigation plan is implemented. In this regard, the following minimum requirements should normally be satisfied prior to any construction in aquatic areas under an issued permit: (1) the mitigation plans have been approved; (2) the mitigation project site has been secured; (3) a permanent source of adequate water is available; and (4) the appropriate financial assurances have been established. In addition, initial physical and biological improvements should typically be completed no later than the first full growing season following impacts to the aquatic environment by issuance of a permit. If that is not practicable, then additional compensatory mitigation or other measures that reduce the risk of failure should be considered as part of the mitigation plan (e.g., use of a higher mitigation ratio or increased financial assurance). For compensatory mitigation involving in-lieu-fee arrangements or mitigation banking agreements, the guidance applicable to those forms of mitigation must be followed. After-the-fact mitigation may be required where permits are issued in response to emergencies or to resolve an</p>

	<p>enforcement action. If a mitigation project is implemented and documented to be successful before the impacts occur from an authorized project, the mitigation ratio necessary to offset the authorized impacts could be reduced, because there would be no temporal loss or risk for the success of the mitigation.</p>	<p>The extensive groundwater monitoring at the Auburn mitigation site (5 years), the 15 year monitoring period, and other design factors (use of irrigation, phased plantings, etc.) required for all sites are important measures that reduce the risk of failure.</p>
8	<p><b>i. Watershed/holistic approach for mitigation.</b> Increasingly, the Corps is taking a watershed approach in the regulatory program. Mitigation projects are most successful if a holistic approach is taken where a variety of aquatic resource types are protected in a mitigation project (whether mitigation bank, in-lieu fee, or project-specific mitigation), including open water, wetland and upland mixes. Where such mix of ecological factors is included in the mitigation, all of those features (open water, wetland, and upland resources which add to the aquatic functions) should be included in the "credits" established.</p>	<p>A primary emphasis of the impact analysis and mitigation for the project has been to evaluate indirect impacts to the creek systems and their supporting watersheds. This analysis has included a comprehensive evaluation of and mitigation for stormwater quantity and stormwater quality impacts. Based on watershed level considerations, mitigation includes the retrofitting of previously developed areas with new stormwater quality and quantity facilities, focusing wetland mitigation in riparian areas, riparian enhancement, embankment design to provide groundwater to downslope riparian wetlands.</p> <p>Open water areas are not established as part of the mitigation project as a result of the wildlife hazards to aviation that could result from them) however, Lora Lake is enhanced for non-avian species and protected in a mitigation area. Upland resources (including buffers and buffer averaging areas) which add to the aquatic functions of the mitigation site are included in the "credits" for the mitigation projects.</p>
9	<p><b>3. Compensatory mitigation project development</b></p> <p>a. <b>Compensatory mitigation plans.</b> The compensatory mitigation plan should describe in detail the physical, biological and legal characteristics of the project, and how the project will be established and operated. Compensatory mitigation proposals submitted with permit applications or nationwide permit pre-construction notices may be either conceptual or detailed depending on how much mitigation credit is needed to ensure the project has minimal impact to the aquatic resource and depending on the reliability of the parties implementing the mitigation to successfully follow through on the effort. However, careful consideration of each component should ensure consistency and enforceability of mitigation plans.</p> <p>At a minimum, the components listed below should be</p>	<p>The recommended components of the mitigation plan have been provided to the COE. The plans have been revised by the COE, DOE, EPA, USFWS, and modified in response to agency comments.</p>

	<p>considered and included in the mitigation plan and/or special permit conditions. A definition for each component is provided in the attached definitions document.</p> <ol style="list-style-type: none"> <li>1. <b>Baseline Information;</b></li> <li>2. <b>Goals of the Mitigation;</b></li> <li>3. <b>Mitigation Work Plan;</b></li> <li>4. <b>Success Criteria;</b></li> <li>5. <b>Monitoring Plan;</b></li> <li>6. <b>Contingency Plan;</b></li> <li>7. <b>Site Protection;</b></li> <li>8. <b>Financial Assurances;</b></li> <li>9. <b>Responsible party for long-term maintenance.</b></li> </ol>	
	<p><b>b. Siting compensatory mitigation projects.</b> The selection of a site for a compensatory mitigation project requires consideration of numerous factors including, but not limited to, the following:</p>	10
<p>The on-site mitigation is located such that it can reasonably be expected to provide appropriate compensation for the impacts to all wetland functions and aquatic resources impacted by the project. Waterfowl habitat is an exception, as grazing areas used by overwintering waterfowl will not be replaced on-site.</p> <p>While on-site mitigation is expected to provide substantial habitat for wildlife, including birds, wildlife management may occur within the mitigation sites if aviation hazards occur. For this reason, off-site mitigation of bird habitat functions is also provided due to concerns over aviation safety (see below). The off-site location, the amount of and the design of the mitigation result in habitat functions that should exceed those provided by the impacted wetlands.</p> <p>The proximity of the off-site location to the impacted area is expected to support the same regional populations of bird species that occur in the impacted wetlands. No decrease in the regional populations of bird or other wildlife would be expected, and no wildlife species would be eliminated from the sub-watersheds that were impacted.</p> <p>Wetland functions are being replaced on-site, and off-site mitigation allows the Port and FAA to comply with the advisory circular in the event that wildlife use of the mitigation sites must be managed according to the WHMP. The off-site mitigation is planned to</p>	<p><b>1. Geographic location.</b> A mitigation project should generally be located within the area (e.g., watershed, county) where a project can reasonably be expected to provide appropriate compensation for the impacts to aquatic resources, including wetlands, under consideration. Mitigation in nearby watersheds may be appropriate and the rationale for this determination should be provided in the mitigation plans. The further removed geographically from the authorized impact the mitigation site is located, the more care must be taken to ensure that the mitigation will reasonably offset the authorized impacts. Ratios should generally increase as the distance between the impact and mitigation sites increase.</p>	11

12	<p>2. <b>Air traffic.</b> Compensatory mitigation projects that have the potential to attract waterfowl and other bird species that might pose a threat to aircraft should not be sited within the limits specified by the Federal Aviation Administration Advisory Circular on <u>Hazardous Wildlife Attracts on or near Airports</u> (AC No: 150/5200-33, 5/1/97) currently 10,000 feet from the airport and 5 statute miles if the attractant may cause hazardous wildlife movement into or across the approach or departure airspace.</p>	<p>fully mitigate the habitat impacts as if no wildlife benefits were derived from the on-site mitigation. The mitigation plan balances the need to replace wetland functions near the location of impacts, yet comply with the FAA advisory circular to provide a safe operating environment for aircraft.</p>
13	<p>c. <b>Use of off-site compensatory mitigation vs. on-site compensatory mitigation.</b> The Corps will carefully consider the use of off-site mitigation, particularly for habitat mitigation such as many wetland mitigation projects. This is particularly important when there is no practicable opportunity for on-site compensation, or when use of an off-site mitigation project is environmentally preferable to on-site mitigation. The 2001 NRC report on mitigation in the Corps Regulatory Program found that on-site mitigation may not be appropriate because of hydrologic alterations and development on-site which could compromise the quality of the mitigation. On-site mitigation is appropriate for vegetated buffers adjacent to open waters and water quality features such as storm water ponds.</p>	<p>Due to the aviation hazards created by wetlands, habitat functions are mitigated in an off-site location. This is no practicable opportunity for on-site compensation and off-site compensation provides opportunities to establish wildlife habitat conditions that would be prohibited by the advisory circular.</p>
14	<p>d. <b>Agency roles and coordination.</b> The Corps will often choose to coordinate proposed mitigation plans with the Environmental Protection Agency, the U.S. Fish &amp; Wildlife Service, the National Marine Fisheries Service, and/or the Natural Resources Conservation Service for technical adequacy. In addition, it is appropriate for representatives from tribal, state, and local regulatory and resource agencies to participate where an agency has authorities and/or mandates directly affecting or affected by the establishment, use or operation of a project. The opportunity for interagency</p>	<p>There has been extensive interagency review of the impact analysis, the wetland functional assessment, and the mitigation plans.</p>

	<p>review of the mitigation plan should be commensurate with the form of authorization being contemplated and the scope of the mitigation requirement (e.g., most nationwide permit compensatory mitigation plans only require review by the Corps). In all cases, however, the Corps will determine the amount and type of compensatory mitigation required by the permit to offset the impacts to be authorized, taking into consideration the other agencies' comments. Tribal, state and local rules and/or laws may independently require more or less mitigation than the Corps requires, but those rules or laws have no legally binding effect on the Corps (unless incorporated as a condition of a Section 401 water quality certification or comparable legal document)</p>	
15	<p><b>e. Public review and comment.</b> The public should be notified of, and have an opportunity to comment on, all proposed mitigation bank or in-lieu-fee arrangements during the development process. Compensatory mitigation projects associated with standard permit applications should be made available for public comment to the extent practicable within the evaluation process (i.e., if the applicant provides a mitigation plan with the application it should be included in the public notice). However, a mitigation plan is not required for issuance of a public notice. If the mitigation plan is detailed, a synopsis may be included in the public notice and detailed plans made available for inspection at the office. For forms of authorization other than standard permits, the opportunity to comment should be based on the scope and potential for impacts to the aquatic resource.</p>	<p>The mitigation projects have been available for public comment during formal comment periods and at all other times since publication of the EIS. The Corps and the Port have made substantial modifications to the mitigation requirements and plans in response to public comments.</p>
16	<p><b>f. Role of the permit applicant.</b> Permit applicants may propose the use of mitigation banks, in-lieu fee arrangements, or separate activity-specific compensatory mitigation projects. For individual permits, the Corps will accept the applicant's proposed mitigation if the Corps determines that the proposed mitigation is appropriate and sufficient (i.e., in or reasonably close to the impact area watershed and sufficient to offset the impacts on a functional basis). For regional general permits</p>	<p>For individual permits, the Corps will accept the applicant's proposed mitigation if the Corps determines that the proposed mitigation is appropriate and sufficient (i.e., in or reasonably close to the impact area watershed and sufficient to offset the impacts on a functional basis).</p>



	<p>associated with Special Area Management Plans or other watershed planning tools, the Corps can identify specific mitigation requirements (e.g., mitigation bank or in lieu fee arrangement). This approach allows the Corps to take a watershed approach in regulating and mitigating impacts.</p> <p><b>g. Party responsible for compensatory mitigation project success.</b> All permits that require compensatory mitigation will contain a provision that specifies the party responsible for planning, accomplishing and maintaining the mitigation project. The Corps, in accordance with the success criteria established for the project, will make the determination of project success.</p>	<p>The Port of Seattle is identified as the party responsible for planning, building, maintaining, and monitoring the mitigation.</p>
17		
18	<p><b>4. Management of compensatory mitigation project sites.</b></p>	
19	<p><b>a. Management and protection.</b></p> <p><b>1. Real estate interests.</b> The wetlands, uplands and/or other aquatic resources in a mitigation project should be permanently protected with appropriate real estate instruments (e.g., conservation easements, deed restrictions, transfer of title to Federal or state resource agencies or non-profit conservation organizations). The Corps may require third party monitoring if necessary to insure permanent protection. In no case will the real estate provisions require a signature by a Corps official. Also, the Corps cannot hold deed restrictions on any property. The real estate provisions will not commit the Corps to any interest in the property in question, unless proper statutory authority is identified that authorizes such an arrangement.</p>	<p>The wetlands, uplands and/or other aquatic resources included in the mitigation project are permanently protected with restrictive covenants that the Corps and Department of Ecology have reviewed and modified.</p>
20	<p><b>2. Funding.</b> The permittee or party responsible for accomplishing and maintaining the mitigation project, including contingency funds for adaptive management, is responsible for securing adequate funds to accomplish those responsibilities associated not only with the development and implementation of the project, but also its long-term management and protection.</p>	<p>The Port is responsible for securing adequate funds to accomplish construction, monitoring, adaptive management, long-term management, and protection of each mitigation site.</p>

21	<p><b>3. Enforcement.</b> All mitigation required by Corps permits is permanent unless otherwise noted in the permit document. The Corps may take enforcement action even after the identified monitoring period has ended.</p>	<p>All mitigation required by Corps permits is permanent unless otherwise noted in the permit document. The Corps may take enforcement action even after the identified monitoring period has ended.</p>
22	<p><b>b. Monitoring requirements.</b> The permittee or the party responsible for accomplishing and maintaining the mitigation project is responsible for monitoring the mitigation project in accordance with monitoring provisions identified in the project plan. Monitoring plans and the frequency of reporting will be designed to allow the Corps to determine the level of success and identify problems requiring remedial action. Monitoring will be required for an adequate period of time, normally 5-10 years, to ensure success.</p>	<p>The Port will monitor the mitigation project in accordance with a 15-year monitoring program.</p>
23	<p><b>c. Remedial action.</b> The project plan should stipulate the general procedures for identifying and implementing remedial measures on a mitigation project. The Corps will determine the need for remediation.</p>	<p>The mitigation plans specify the general procedures for identifying and implementing remedial measures on a mitigation project.  The Corps will determine the need for remediation.</p>



US Army Corps  
of Engineers.

# REGULATORY GUIDANCE LETTER

No. 01-1

Date: 31 October 2001

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**SUBJECT:** Guidance for the Establishment and Maintenance of Compensatory Mitigation Projects Under the Corps Regulatory Program Pursuant to Section 404(a) of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899

## 1. Purpose and applicability

a. **Purpose.** Corps permits issued under Section 404(a) of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 routinely contain conditions that relate to compensatory mitigation for resources that are going to be adversely affected or lost as a result of a permitted activity. The Corps is strongly committed to protection of the overall aquatic environment on a watershed basis, including fully mitigating authorized impacts to all aquatic resources, including wetlands. As discussed in the National Research Council (NRC) report, *Compensating for Wetland Losses Under the Clean Water Act*, (June, 2001), the Corps must increase the effectiveness and compliance of mitigation required for authorized impacts to the aquatic environment, including wetlands. This guidance letter provides direction concerning factors that affect compensatory mitigation success in a variety of contexts. This guidance adopts definitions that were developed for use in accounting for the types of mitigation used in Federal efforts to meet the national no overall net loss policy and to account for projects designed solely to increase the nation's wetland base. These terms were published on the U.S. Fish and Wildlife Service web page in July 2000, for use in reporting gains and losses by Federal resource management agencies.

The guidance also adopts the use of the terms "credit" and "debit". Acres have traditionally been used as the standard measure in discussions of compensatory mitigation as it relates to the national no overall net loss policy. This is primarily due to the difficulty in finding one standard for quantifying the different functional components considered during the evaluation of the ecological and physical parameters required for decision-making. The use of an accounting system based on credits and debits allows the program to demonstrate comparability of the mitigation being required for authorized impacts. The terms may change as methods and techniques evolve to better describe the relationship between an adverse effect and the compensatory mitigation required to offset or reduce that adverse effect. Nevertheless, the concepts embodied in the guidance below are intended to fully support the national no overall net loss policy for wetlands and to provide a basis for formulating decisions that will more effectively and fully mitigate impacts to other aquatic resources, such as flowing streams.

b. **Applicability.** This guidance applies to compensatory mitigation proposals submitted

AR 002670

for approval on or after the effective date of this guidance and to those in the early stages of planning or development. These policies are not retroactive for mitigation projects that have already received approval.

## **2. General Considerations.**

All mitigation required by the Corps should be based on a consideration of regional aquatic resource requirements. Districts should take an ecosystem approach to the formulation of compensatory mitigation projects considering the resource needs of immediate and nearby watersheds. Mitigation that includes a mix of habitats such as open water (e.g., streams) as well as wetlands and adjacent uplands is normally more ecologically sustainable.

**a. Debit/Credit assessment.** The evaluation of adverse effects should be undertaken with a view toward being able to assign an identified debit to be offset by a credit. The method for assessing debits should be comparable to the method used for assigning credits. Corps regulatory program project managers are responsible for using district-approved methods (e.g., the Hydrogeomorphic Approach or acre-for-acre ratios) for assessing and assigning credits or debits in terms of amount, type and location. The definitions for "debit" and "credit" are provided (see attached definitions document).

**b. Role of preservation.** Credit may be given when existing wetlands and/or other aquatic resources are preserved (protected/maintained) in conjunction with establishment, restoration, rehabilitation, and enhancement activities and when it is demonstrated that the preservation will augment the functions of the established, restored, rehabilitated or enhanced aquatic resource. Such augmentation may be reflected in the amount of credit attributed to the entire mitigation project. In addition, the permanent preservation of existing wetlands and/or other aquatic resources may be authorized as the sole basis for generating credits in mitigation projects. In either case, consideration must be given to whether wetlands and/or other aquatic resources proposed for preservation perform physical, chemical and/or biological functions, the preservation of which is important to the region in which the mitigation site will be located. Aquatic areas, including wetlands, that are preserved as mitigation should also be under some documented level of threat for development, which is the case for most privately held wetlands or other aquatic areas.

**c. Inclusion of upland areas.** Credit may be given for the inclusion of upland areas occurring within a compensatory mitigation project to the degree that the protection and management of such upland areas is an enhancement of aquatic functions and increases the overall ecological functioning of the mitigation project (e.g., vegetated buffers or a mix of habitats).

**d. Vegetated buffers.** Compensatory mitigation plans for projects in or near streams or other open waters should normally include a requirement for the establishment and maintenance of vegetated buffers next to open waters on the project site. In many cases, vegetated buffers will be the only compensatory mitigation required and may be wetland, upland or a composite mix of the two. Vegetated buffers should normally consist of native species. The width of the vegetated

buffers should be determined based on documented water quality or aquatic habitat loss concerns. Vegetated buffers need not be required to be as wide as some technical literature would suggest since the literature addresses the pre-human colonization of North America. Normally, vegetated buffers will be 50 feet wide or less on each side of a stream or other open water area. All vegetated buffers should be designed to provide water quality or aquatic habitat functions (e.g., shading, habitat for animals that require aquatic and adjacent upland areas as habitat) and ecological value.

e. **Use of in-kind vs. out-of-kind mitigation.** In the interest of achieving functional replacement, in-kind compensation of aquatic resource impacts will often be appropriate. However, because compensatory mitigation decisions should take into account the functions of the aquatic environment, including wetlands, within both the landscape mosaic as well as a watershed context, out-of-kind compensation may also be appropriate. Out-of-kind compensation should be practicable and environmentally equal or preferable to in-kind compensation (i.e., of equal or greater ecological value to a particular region). However, non-tidal aquatic areas including wetlands should typically not be used to compensate for the loss or degradation of tidal aquatic areas including wetlands, nor should the reverse be true. Decisions to require or allow out-of-kind mitigation are made on a case-by-case basis during the permit evaluation process and should also consider the location (e.g., surrounding land uses). Such decisions are usually based on the amount of debits assigned to the impact site in comparison to the credits assigned to the compensatory action (e.g., loss of a degraded site associated with the restoration of a particularly vulnerable or valuable aquatic habitat type).

f. **Mitigation ratios.** The Corps regulatory program allows for the use of ratios in determining the amount of compensation required when there is a difference between the kind of aquatic resource being impacted and the kind of mitigation being required. Ratios must be based on an identifiable rationale (e.g., use of an assessment methodology, rationale based on a regional aquatic resource context, or a case-by-case rationale briefly described in the decision document). Other factors affecting mitigation ratios include temporal losses between the time of impact and the time the mitigation site achieves a fully functional level and the likelihood of mitigation success. All use of ratios should be to ensure that the underlying policy of offsetting the authorized impacts will occur.

g. **Types of compensatory mitigation.** The types of mitigation projects used in compensating for the loss of aquatic resources including wetland impacts are listed below. A definition for each type of compensatory mitigation project is provided in the attached definitions document. The current view is that restoration efforts provide the best potential for success in terms of providing functional compensation; however, each type of mitigation has utility and may be used as compensatory mitigation. When assigning credit for a particular type or mix of mitigation types within a mitigation project, the credit for the entire mitigation project should be compared to the debit(s) formulated for the impact(s) being authorized.

#### 1. Establishment

2. **Restoration (includes re-establishment and rehabilitation)**
3. **Enhancement**
4. **Protection/Maintenance.**

h. **Timing of mitigation construction.** Financial and ecological considerations play important roles in mitigation project development. It is generally appropriate, in cases where there is adequate financial assurance and/or where the likelihood of success of the project is high, to allow an impact to occur before the mitigation plan is implemented. In this regard, the following minimum requirements should normally be satisfied prior to any construction in aquatic areas under an issued permit: (1) the mitigation plans have been approved; (2) the mitigation project site has been secured; (3) a permanent source of adequate water is available; and (4) the appropriate financial assurances have been established. In addition, initial physical and biological improvements should typically be completed no later than the first full growing season following impacts to the aquatic environment by issuance of a permit. If that is not practicable, then additional compensatory mitigation or other measures that reduce the risk of failure should be considered as part of the mitigation plan (e.g., use of a higher mitigation ratio or increased financial assurance). For compensatory mitigation involving in-lieu-fee arrangements or mitigation banking agreements, the guidance applicable to those forms of mitigation must be followed. After-the-fact mitigation may be required where permits are issued in response to emergencies or to resolve an enforcement action. If a mitigation project is implemented and documented to be successful before the impacts occur from an authorized project, the mitigation ratio necessary to offset the authorized impacts could be reduced, because there would be no temporal loss or risk for the success of the mitigation.

i. **Watershed/holistic approach for mitigation.** Increasingly, the Corps is taking a watershed approach in the regulatory program. Mitigation projects are most successful if a holistic approach is taken where a variety of aquatic resource types are protected in a mitigation project (whether mitigation bank, in-lieu fee, or project-specific mitigation), including open water, wetland and upland mixes. Where such mix of ecological factors is included in the mitigation, all of those features (open water, wetland, and upland resources which add to the aquatic functions) should be included in the "credits" established.

### 3. Compensatory mitigation project development

a. **Compensatory mitigation plans.** The compensatory mitigation plan should describe in detail the physical, biological and legal characteristics of the project, and how the project will be established and operated. Compensatory mitigation proposals submitted with permit applications or nationwide permit pre-construction notices may be either conceptual or detailed depending on how much mitigation credit is needed to ensure the project has minimal impact to the aquatic resource and depending on the reliability of the parties implementing the mitigation to successfully follow through on the effort. However, careful consideration of each component should ensure consistency and enforceability of mitigation plans.

At a minimum, the components listed below should be considered and included in the mitigation plan and/or special permit conditions. A definition for each component is provided in the attached definitions document.

1. **Baseline Information;**
2. **Goals of the Mitigation;**
3. **Mitigation Work Plan;**
4. **Success Criteria;**
5. **Monitoring Plan;**
6. **Contingency Plan;**
7. **Site Protection;**
8. **Financial Assurances;**
9. **Responsible party for long-term maintenance.**

b. **Siting compensatory mitigation projects.** The selection of a site for a compensatory mitigation project requires consideration of numerous factors including, but not limited to, the following:

1. **Geographic location.** A mitigation project should generally be located within the area (e.g., watershed, county) where a project can reasonably be expected to provide appropriate compensation for the impacts to aquatic resources, including wetlands, under consideration. Mitigation in nearby watersheds may be appropriate and the rationale for this determination should be provided in the mitigation plans. The further removed geographically from the authorized impact the mitigation site is located, the more care must be taken to ensure that the mitigation will reasonably offset the authorized impacts. Ratios should generally increase as the distance between the impact and mitigation sites increase.

2. **Air traffic.** Compensatory mitigation projects that have the potential to attract waterfowl and other bird species that might pose a threat to aircraft should not be sited within the limits specified by the Federal Aviation Administration Advisory Circular on Hazardous Wildlife Attracts on or near Airports (AC No: 150/5200-33, 5/1/97) currently 10,000 feet from the airport and 5 statute miles if the attractant may cause hazardous wildlife movement into or across the approach or departure airspace.

c. **Use of off-site compensatory mitigation vs. on-site compensatory mitigation.** The Corps will carefully consider the use of off-site mitigation, particularly for habitat mitigation such as many wetland mitigation projects. This is particularly important when there is no practicable opportunity for on-site compensation, or when use of an off-site mitigation project is environmentally preferable to on-site mitigation. The 2001 NRC report on mitigation in the Corps Regulatory Program found that on-site mitigation may not be appropriate because of hydrologic alterations and development on-site which could compromise the quality of the mitigation. On-site mitigation is appropriate for vegetated buffers adjacent to open waters and water quality features such as storm water ponds.

**d. Agency roles and coordination.** The Corps will often choose to coordinate proposed mitigation plans with the Environmental Protection Agency, the U.S. Fish & Wildlife Service, the National Marine Fisheries Service, and/or the Natural Resources Conservation Service for technical adequacy. In addition, it is appropriate for representatives from tribal, state, and local regulatory and resource agencies to participate where an agency has authorities and/or mandates directly affecting or affected by the establishment, use or operation of a project. The opportunity for interagency review of the mitigation plan should be commensurate with the form of authorization being contemplated and the scope of the mitigation requirement (e.g., most nationwide permit compensatory mitigation plans only require review by the Corps). In all cases, however, the Corps will determine the amount and type of compensatory mitigation required by the permit to offset the impacts to be authorized, taking into consideration the other agencies' comments. Tribal, state and local rules and/or laws may independently require more or less mitigation than the Corps requires, but those rules or laws have no legally binding effect on the Corps (unless incorporated as a condition of a Section 401 water quality certification or comparable legal document)

**e. Public review and comment.** The public should be notified of, and have an opportunity to comment on, all proposed mitigation bank or in-lieu-fee arrangements during the development process. Compensatory mitigation projects associated with standard permit applications should be made available for public comment to the extent practicable within the evaluation process (i.e., if the applicant provides a mitigation plan with the application it should be included in the public notice). However, a mitigation plan is not required for issuance of a public notice. If the mitigation plan is detailed, a synopsis may be included in the public notice and detailed plans made available for inspection at the office. For forms of authorization other than standard permits, the opportunity to comment should be based on the scope and potential for impacts to the aquatic resource.

**f. Role of the permit applicant.** Permit applicants may propose the use of mitigation banks, in-lieu fee arrangements, or separate activity-specific compensatory mitigation projects. For individual permits, the Corps will accept the applicant's proposed mitigation if the Corps determines that the proposed mitigation is appropriate and sufficient (i.e., in or reasonably close to the impact area watershed and sufficient to offset the impacts on a functional basis). For regional general permits associated with Special Area Management Plans or other watershed planning tools, the Corps can identify specific mitigation requirements (e.g., mitigation bank or in lieu fee arrangement). This approach allows the Corps to take a watershed approach in regulating and mitigating impacts.

**g. Party responsible for compensatory mitigation project success.** All permits that require compensatory mitigation will contain a provision that specifies the party responsible for planning, accomplishing and maintaining the mitigation project. The Corps, in accordance with the success criteria established for the project, will make the determination of project success.



4. Management of compensatory mitigation project sites.

a. **Management and protection.**

1. **Real estate interests.** The wetlands, uplands and/or other aquatic resources in a mitigation project should be permanently protected with appropriate real estate instruments (e.g., conservation easements, deed restrictions, transfer of title to Federal or state resource agencies or non-profit conservation organizations). The Corps may require third party monitoring if necessary to insure permanent protection. In no case will the real estate provisions require a signature by a Corps official. Also, the Corps cannot hold deed restrictions on any property. The real estate provisions will not commit the Corps to any interest in the property in question, unless proper statutory authority is identified that authorizes such an arrangement.

2. **Funding.** The permittee or party responsible for accomplishing and maintaining the mitigation project, including contingency funds for adaptive management, is responsible for securing adequate funds to accomplish those responsibilities associated not only with the development and implementation of the project, but also its long-term management and protection.

3. **Enforcement.** All mitigation required by Corps permits is permanent unless otherwise noted in the permit document. The Corps may take enforcement action even after the identified monitoring period has ended.

b. **Monitoring requirements.** The permittee or the party responsible for accomplishing and maintaining the mitigation project is responsible for monitoring the mitigation project in accordance with monitoring provisions identified in the project plan. Monitoring plans and the frequency of reporting will be designed to allow the Corps to determine the level of success and identify problems requiring remedial action. Monitoring will be required for an adequate period of time, normally 5-10 years, to ensure success.

c. **Remedial action.** The project plan should stipulate the general procedures for identifying and implementing remedial measures on a mitigation project. The Corps will determine the need for remediation.

5. **Duration.** This guidance remains effective unless revised or rescinded.

FOR THE COMMANDER:

Encl



ROBERT H. GRIFFIN  
Brigadier General, U.S. Army  
Director of Civil Works

## Definition of Terms

1. **Baseline Information:** The mitigation plan should include a written statement which defines the location, size, type, functions and amount of debit associated with the aquatic and other resources to be impacted and the amount of credit resulting from the mitigation project. This baseline information should include a description of the location of the proposed mitigation site in relation to the aquatic resource area to be impacted. Baseline information may include quantitative sampling data for both the proposed mitigation site and the project impact area. In addition, the size (e.g., acreage of wetlands, length and width of streams) and timing of the mitigation should be articulated clearly.

2. **Goals of the mitigation:** The mitigation plan should include a written statement of environmental goals and objectives. The goals should discuss the aquatic resource type (e.g., Hydrogeomorphic (HGM) class of wetlands or Rosgen class for streams) and the functions of the aquatic resources anticipated to be impacted and to be developed at the mitigation site(s). For example, for tidal wetlands, mitigation may be designed to replace lost finfish and shellfish habitat, lost estuarine production, or lost water quality functions associated with tidal backwater flooding.

### 3. Resource Comparison:

a. **Credit.** A unit of measure (e.g., functional capacity units in HGM) representing the gain of aquatic functions at a compensatory mitigation site; the measure of function is typically indexed to the number of acres of resources restored, established, enhanced, rehabilitated or protected/maintained as compensatory mitigation.

b. **Debit.** A unit of measure (e.g., functional capacity units in HGM) representing the loss of aquatic functions at an impact or project site; the measure of function is typically indexed to the number of acres lost or impact by issuance of the permit.

4. **Mitigation Work Plan:** The mitigation work plan should include detailed written specifications and descriptions of the work to be performed, including, but not limited to:

a. Boundaries of proposed restoration, establishment, enhancement, rehabilitation or protected/maintained areas (e.g., maps and drawings);

b. Replacement ratios developed consistent with the known difficulty and risk of replacement. The risk of mitigation failure is greater where the source and frequency of hydrology are uncertain and/or where a greater plant diversity is required. Therefore, these mitigation projects may require a higher ratio than those aquatic systems with greater predictability;

c. Construction methods, timing and sequence;

- d. Data indicating historic and existing hydrology, stream bottom and/or soil conditions;
- e. Source of water supply and connections to existing waters and proximity to uplands.  
In some areas, a water budget may also be necessary;
- f. Elevations of existing ground at mitigation site;
- g. Plant materials and scheme for planting;
- h. Methods and times of year for planting;
- i. Plans for control of exotic vegetation;
- j. Elevation(s) and slope(s) of the proposed mitigation area to ensure they conform with required elevation for target plant species. Survey data indicating final elevations of the area(s) to be planted should be provided prior to commencement of planting;
- k. Erosion control measures to prevent upland erosion into site are indicated;
- l. Stream or other open water geomorphology and features such as riffles and pools, bends, deflectors, etc.;
- m. A plan outlining the short and long term management and maintenance of the mitigation site.

**5. Ecologically based success criteria:** Written criteria will be developed to measure success of the compensatory mitigation and included in the permit. The success criteria will be used to determine if the mitigation is in compliance with the terms and conditions of the permit. The criteria may set specific quantitative measurements that must be met (e.g., a minimum duration of soil saturation based on groundwater well data, 80 percent vegetative cover by target species by the end of the second growing season). The criteria can also be based on reference sites and should provide the flexibility necessary to allow, when environmentally desirable, unanticipated changes (e.g., natural stream channel adjustments or long-term drought conditions). This flexibility is critical because mitigation projects do not benefit from continuous requirements to replant target species that cannot survive in the restored, established or enhanced aquatic area as designed. Changing plant species or the physical design parameters should be undertaken early in the mitigation phase when remediation is required. Criteria for the operation of mitigation sites should be based on the following (the detail will depend on the size and ecological importance of the mitigation area):

- a. Consider the hydrogeomorphic and ecological landscape and climate. Because landscapes have natural patterns that provide for sustainable levels of functions of individual

aquatic areas including wetlands, permittees should locate mitigation sites in the comparable hydrogeomorphic class and/or the appropriate landscape setting. Sites with nearby wetlands will have natural recruitment sources for plants and animals resulting in more overall sustainability.

b. Adopt a dynamic landscape perspective. Mitigation site locations should be made resilient to disturbances that occur in the surrounding landscapes by, for example, preserving large buffers and connectivity to other aquatic areas and tapping into surrounding natural processes and energies.

c. Restore or develop naturally variable hydrological conditions. The hydrology of naturally occurring wetlands and other aquatic areas often fluctuates in water level, flow distribution, and frequency and this variability should translate to mitigation sites. Preferably, hydrology should be restored without reliance on human intervention (e.g., pumping water) that requires continual maintenance.

d. Whenever possible, choose restoration over establishment. Restoration generally is more feasible and sustainable than establishment and has a greater likelihood of success. Restoration includes rehabilitation (e.g., removal of a chronic source of sediment to a stream with an excessive bedload).

e. Avoid over-engineered structures. Mitigation projects should be designed to require minimal long-term maintenance.

f. Pay particular attention to appropriate planting elevation, depth, soil type and seasonal timing and depth, duration and timing of water delivery.

g. Provide appropriately heterogeneous topography. Microtopography and topographic variation are needed to promote appropriate hydroperiods that plants and animals depend on for survival. Use adjacent or nearby natural systems as models for aquatic elevations and flooding regimes. Require as-built survey data from sites where changes in topographic elevations are proposed as part of the mitigation plan.

h. Pay attention to subsurface conditions, including soil and sediment geochemistry and physics, soil compaction, groundwater quantity and quality, and infaunal communities. An understanding of soil permeability, texture and stratigraphy is needed before mitigation takes place. Also, the chemical structure of soils, surface water, groundwater and tides will affect the long-term outcome of a mitigation site. If practical, use the topsoil from the impacted wetlands for construction of the new wetland, as it will contain a hydrophytic vegetation seed bank.

i. Consider complications associated with wetland and other area establishment or restoration in seriously degraded or disturbed sites. Disturbances associated with degraded wetlands in developed areas (e.g., subdivisions) can result in the extensive invasion by exotic

species requiring active long-term management to support native species and maintain natural processes.

j. Require early monitoring as part of adaptive management. Mitigation should incorporate a monitoring program that provides early indications of problems such as exotic plant infestations integrated with an adaptive management process.

k. Take a holistic watershed approach when requiring mitigation. Typically, a mix of habitats, including not only wetlands, streams and other open waters but also uplands, should be considered.

6. **Contingency Plan:** A contingency plan should be provided to allow for mid-course corrections, if necessary. A performance bond will be considered and implemented if appropriate.

7. **Site Protection:** A written discussion of the means of protecting the mitigation area(s) will be developed and the permit conditioned accordingly. Methods include, but are not limited to, conservation easements, deed restrictions, preservation areas, etc. Generally, conservation easements held by state or local government, other Federal agencies such as the Fish and Wildlife Service, or non-governmental groups such as The Nature Conservancy or land trusts, are preferable to deed restrictions. Using homeowner's associations as the grantee in a deed restriction or conservation easement or simply relying on rules that govern homeowner's associations has had mixed results nationwide. Consequently, homeowner's associations should be used for these purposes only in exception circumstances.

8. **Financial Assurances:** Sufficient funds or other financial assurances need to be present to cover contingency actions in the event of default by the party responsible for mitigation success or failure to meet the success criteria. Accordingly, projects posing a greater risk of failure (e.g., no naturally occurring hydrology) should have comparatively higher financial sureties in place than those where the likelihood of success is more certain. This is especially important in situations where the impacts occur prior to construction and complete functioning of the mitigation site. Financial assurances may be in the form of performance bonds, irrevocable trusts, escrow accounts, casualty insurance, letters of credit, legislatively enacted dedicated funds for government operated banks or other approved instruments. Such assurances may be phased-out or reduced, once it has been demonstrated that the project is functionally mature and/or self-sustaining in accordance with success criteria.

9. **Mitigation Types:** These are standard definitions for wetlands. Similar criteria and approaches should be used for streams and other open water areas.

a. **Establishment:** The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site, where a wetland did not previously exist. Establishment results in a gain in wetland acres.

**b. Restoration:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:

1. **Re-establishment:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland. Re-establishment results in rebuilding a former wetland and results in a gain in wetland acres.

2. **Rehabilitation:** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions of a degraded wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres.

**c. Enhancement:** The manipulation of the physical, chemical, or biological characteristics of a wetland (undisturbed or degraded) site to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for a specified purpose(s) such as water quality improvement, flood water retention, or wildlife habitat. Enhancement results in a change in wetland function(s) and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. This term includes activities commonly associated with enhancement, management, manipulation, and directed alteration.

**d. Protection/Maintenance:** The removal of a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. Includes purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation. Protection/Maintenance does not result in a gain of wetland acres.

Attachment D

WASHINGTON STATE WETLAND MITIGATION EVALUATION STUDY

PHASE I RAW RESULTS

Phase I Raw Results - Table 1

site #	County	impact size (acres)	mitigation size (acres)	creation acreage	restor. acreage	enhanc. acreage	preserv. acreage	buffer/ upland acreage	age of mitigation	built?	built to plan?
<b>Westside Sites</b>											
8	Grays Harbor	4.92	205.05	0.32	8.22	84.47	112.04	0	<1	Y	N
9	Whatcom	21.1	96.1	16.1	0	5	75	riparian	5 & 4	Y	Y
11	Pacific	1.57	11.36	0	0.37	0	10.99	0	NA	Y	Y
14	Skagit	1.76	4.21	0	0	2.21	0	2	2+	Y	Y
17	Pacific	1.43	10	0	0	0	8.3	1.7	NA	Y	Y
33	King	0.07	0.14	0.14	0	0	0	0	2+	Y	N
46	Pacific	0.24	0.3	0.3	0	0	0	0	6	Y	N
55	Snohomish	0.94	7.54	0.12	0	3.09	0	4.33	<1	Y	Y
62	Mason	0.31	0.62	0.18	0.44	0	0	0	1+	Y	N
89	Pierce	2.2	3.6	0.98	0	0.96	0	1.66	4+	Y	Y
99	Clark	1.84	0	0	0	0	0	yes	2+	Y	CND
116	King	17.4	56.5	1.5	9.2	45.8	0	0	2+	Y	Y
125	Pacific	0.47	3.65	0	0.15	0	3.5	0	NA	Y	Y
151	King	0.98	1.6	0	1.4	0.2	0	0	<7	Y	Y
163	Snohomish	1.84	7	0	1.97	3.78	0	1.25	2+	Y	Y
180	Snohomish	2.53	3.22	2.63	0.19	0	0	0.4	<1	Y	N
193	King	1.59	5.82	1.75	0	1.57	0	2.5	2+	Y	Y
204	Cowlitz	2.68	4.28	0	4.28	0	0	yes	<1	Y	Y
218	Lewis	1.17	1.75	0.55	0	1.2	0	riparian	NA	N	NA
232	Snohomish	0.79	0.79	0.79	0	0	0	yes	<1	Y	N
233	Snohomish	0.41	0.82	0	0.82	0	0	0	<3	Y	N
239	Grays Harbor	0.14	0.21	0.09	0	0.12	0	0	5+	Y	CND
243	Skagit	1.99	4	0	0	4	0	0	3	Y	Y
278	Snohomish	0.06	0.28	0.28	0	0	0	yes	3+	Y	Y
289	Whatcom	1.83	10	6	0	0	0	4	1+	Y	N
290	Pacific	0.7	0.7	0	0	0	0.7	0	NA	Y	Y
294	King	0.22	2.71	0.21	0	0	2.5	0	4+	Y	Y
299	Clark	0.83	0.56	0	0	0.56	0	0	NA	N	NA
300	Clark	1.31	3.54	0	0	3.49	0	0.05	5+	Y	Y
305	Clark	2.15	10.9	0	0	10.9	0	0	1+	Y	N
325	King	0.86	1.32	0.88	0	0.44	0	0	<1	Y	Y
334	Kitsap	0.67	2.86	0	0	0.9	0	1.96	3	Y	N
336	King	2.83	6.83	0	2.06	4.01	0	0.76	1+	Y	Y
357	Clark	6.55	34.9	3.5	0	9.02	19	3.38	<1	Y	Y
378	Clark	1.6	6.86	0	0	6.86	0	yes	1+	Y	N
389	Clark	1.97	43.82	0	0	8	21	14.82	1+	Y	Y
398	Wahkiakum	2.7	2.7	2.7	0	0	0	yes	NA	N	NA
400	Snohomish	1.54	4.62	2.03	0	0.32	0	2.27	2 & 1	Y	Y
<b>Westside Total</b>		<b>94.19</b>	<b>561.16</b>	<b>41.05</b>	<b>29.1</b>	<b>196.9</b>	<b>253.03</b>	<b>41.08</b>		<b>35</b>	<b>22</b>
<b>Eastside Sites</b>											
7	Franklin	0.27	0.54	0.54	0	0	0	yes	5+	Y	N
10	Benton	0.13	0.137	0	0.137	0	0	0	<3	Y	N
13	Kittitas	0.9	2.47	1.92	0.55	0	0	yes	2+	Y	Y
14	Spokane	0.141	0.144	0.144	0	0	0	yes	4+	Y	N
29	Ferry	0.935	9.5	0	0	9.5	0	riparian	6+	Y	CND
41	Spokane	1.87	3.53	3.53	0	0	0	0	2+	Y	N
50	Spokane	0.09	0.46	0.46	0	0	0	yes	4+	Y	N
<b>Eastside Total</b>		<b>4.336</b>	<b>16.781</b>	<b>6.594</b>	<b>0.687</b>	<b>9.5</b>	<b>0</b>	<b>0</b>		<b>6</b>	<b>1</b>
<b>Statewide Total</b>		<b>98.526</b>	<b>577.941</b>	<b>47.644</b>	<b>29.787</b>	<b>206.4</b>	<b>253.03</b>	<b>41.08</b>		<b>42</b>	<b>23</b>



**Phase I Raw Results-Table 1 cont.**

Site #	total # of performance standards	# of P.S. assessed	# of P.S. met of those assessed	P.S. met?	as-built required?	as-built found?	monitoring required?	monitoring found?	deed restriction required?	deed restriction found?
<b>Westside Sites</b>										
8	5	1	1	Y	Y	N	Y	N	Y	Y
9	11	5	4	N	Y	Y	Y	Y	Y	Y
11	NA	NA	NA	NA	NA	NA	NA	NA	Y	Y
14	9	3	3	Y	Y	Y	Y	Y	Y	N
17	NA	NA	NA	NA	NA	NA	NA	NA	Y	Y
33	3	1	1	Y	N	NA	N	NA	N	NA
46	0	0	0	NA	Y	N	Y	N	Y	N
55	3	1	1	Y	N	NA	N	NA	N	NA
62	1	1	0	N	Y	N	Y	N	N	NA
89	4	3	1	N	N	NA	N	Y (NA)	N	NA
99	1	1	0	N	Y	N	Y	N	Y	N
116	26	4	0	N	Y	Y	Y	Y	Y	Y
125	NA	NA	NA	NA	NA	NA	NA	NA	Y	Y
151	4	3	2	N	Y	Y	Y	Y	N	N
163	9	1	0	N	Y	Y	Y	N	Y	Y
180	3	0	0	CND	Y	N	Y	N	Y	N
193	6	5	4	N	Y	Y	Y	N	Y	N
204	6	1	1	Y	Y	Y	Y	N	Y	N
218	NA	NA	NA	NA	Y (NA)	NA	Y (NA)	NA	Y (NA)	NA
232	4	3	0	N	N	Y (NA)	N	NA	N	NA
233	10	2	0	N	N	NA	N	NA	N	NA
239	1	1	0	N	Y	N	Y	N	N	NA
243	2	0	0	CND	Y	Y	Y	Y	Y	N
278	4	2	2	Y	Y	Y	N	NA	Y	N
289	14	1	1	Y	Y	Y	Y	N	Y	Y
290	NA	NA	NA	NA	NA	NA	NA	NA	Y	Y
294	3	1	1	Y	Y	N	Y	Y	Y	Y
299	NA	NA	NA	NA	Y	NA	Y	NA	Y	NA
300	2	2	1	N	N	NA	Y	Y	N	NA
305	3	2	0	N	Y	N	Y	N	Y	N
325	3	1	1	Y	CND	Y	CND	N	CND	N
334	2	2	0	N	CND	N	CND	N	CND	N
336	9	1	0	N	Y	Y	Y	N	Y	N
357	4	2	0	N	Y	Y	Y	Y	Y	Y
378	2	2	0	N	Y	N	Y	Y	Y	N
389	4	3	3	Y	Y	Y	Y	Y	Y	Y
398	NA	NA	NA	NA	Y	NA	Y	NA	N	NA
400	3	2	2	Y	Y	Y	Y	Y	Y	N
<b>W.Total</b>	<b>161</b>	<b>57</b>	<b>29</b>	<b>11</b>	<b>26</b>	<b>16</b>	<b>26</b>	<b>12</b>	<b>26</b>	<b>12</b>
<b>Eastside Sites</b>										
7	1	1	0	N	N	NA	Y	N	N	NA
10	1	1	0	N	Y	N	Y	N	Y	N
13	6	1	1	Y	Y	Y	Y	Y	Y	N
14	0	0	0	NA	N	NA	N	NA	Y	N
29	1	1	0	N	Y	N	Y	Y	Y	N
41	3	2	1	N	Y	N	Y	Y	N	NA
50	6	4	0	N	Y	N	Y	N	Y	N
<b>E. Total</b>	<b>18</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>0</b>
<b>Total</b>	<b>179</b>	<b>67</b>	<b>31</b>	<b>12</b>	<b>31</b>	<b>17</b>	<b>32</b>	<b>15</b>	<b>31</b>	<b>12</b>

Attachment E

**PROPOSED DRAFT RULE  
WAC-173-700 WETLAND MITIGATION BANKS**



PROPOSED RULE MAKING (RCW 34.05.320)

CR-102 (7/22/01) Do NOT use for expedited rule making

Agency: Department of Ecology A.O. 98-26
Preproposal Statement of Inquiry was filed as WSR 99-03-097; or
Expedited Rule Making -- Proposed notice was filed as WSR \_\_\_\_; or
Proposal is exempt under RCW 34.05.310(4).

Original Notice
Supplemental Notice
to WSR
Continuance of WSR

Title of rule: (Describe Subject) Wetland Mitigation Banks
Purpose: The purpose of the rule is to provide a predictable, efficient, regulatory framework for the review of bank proposals and the certification of environmentally responsible wetland mitigation banks consistent with existing federal guidance on compensatory wetland mitigation banks.
Other identifying information: The proposed rule applies to both public and private wetland mitigation banks. Credits from certified wetland mitigation banks may be used to compensate for unavoidable wetland impacts authorized under state or local permits.

(b) Statutory authority for adoption: Chapter 90.84 RCW Wetlands Mitigation Banking
Statute being implemented: Chapter 90.84 RCW Wetlands Mitigation Banking

(c) Summary: The rule outlines procedures for the certification, operation, monitoring and implementation of compensatory wetland mitigation banks. The rule contains procedures for certification and technical requirements for the implementation of wetland mitigation banks. The rule outlines compliance procedures and the appeals process for wetland mitigation bank certifications.

Reasons supporting proposal: The legislature required the department, in Chapter 90.84, to adopt rules for the "certification, operation and monitoring of wetland mitigation banks." The statute also directed that the rule provide a "predictable, efficient, regulatory framework" for the certification of wetland mitigation banks.

Table with 3 columns: Name of Agency Personnel Responsible for, Office Location, Telephone. Rows for Drafting, Implementation, and Enforcement.

(e) Name of proponent (person or organization): Washington State Department of Ecology
Private
Public
Governmental

(f) Agency comments or recommendations, if any, as to statutory language, implementation, enforcement and fiscal matters:

(i) Is rule necessary because of:
Federal Law? Yes No
Federal Court Decision? Yes No
State Court Decision? Yes No
If yes, ATTACH COPY OF TEXT
Citation:

(h) HEARING LOCATION:
January 23, 2002 January 30, 2002
Washington State Dept. of Ecology Best Western Hallmark Inn
3 Desmond Drive 3000 Marine Drive
Lacey, Washington, Moses Lake Washington
7 p.m. 7 p.m.
Date: January 23 and 30, 2002 Time: 7 p.m.

Submit written comments to:
Lauren Driscoll
Shorelands and Environmental Assistance Program
Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
FAX (360) 407-6902 By (date) Postmarked by February 15, 2002
DATE OF INTENDED ADOPTION: April 17, 2002

Assistance for persons with disabilities: Contact
Mary Lynum by January 16, 2002
TDD (360) 407-6006 or (360) 407-6206

NAME (TYPE OR PRINT)
Linda Hoffman

SIGNATURE
Linda Hoffman

TITLE
Deputy Director
DATE
12-17-01

CODE REVISER USE ONLY
CODE REVISER'S OFFICE
STATE OF WASHINGTON
AR 002686
DEC 17 2001
1133
AM
PM
02-01-092

Short explanation of rule, its purpose, anticipated effects:  
The rule sets out the procedures and requirements for certification of wetland mitigation banks. The legislature, in Chapter 90.84 RCW, directed the Department of Ecology to adopt rules for the certification of wetland mitigation banks. The rule is intended to provide an efficient and predictable regulatory framework for applicants voluntarily seeking state certification for a wetland mitigation bank. It is anticipated that the regulatory streamlining provided under the draft rule will reduce applicant costs for obtaining approvals on wetland mitigation banks as well as ensuring that wetland mitigation banks established will be environmentally sound. Additional streamlining and cost reductions should be realized by project applicants using certified bank credits in lieu of developing their own compensatory wetland mitigation.

Does proposal change existing rules?  YES  NO

If yes, describe changes:

Has a small business economic impact statement been prepared under chapter 19.85 RCW?

Yes. Attach copy of small business economic impact statement.

A copy of the statement may be obtained by writing to:

Lauren Driscoll  
Shorelands and Environmental Assistance Program  
Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504-7600

telephoning: (360) 407-6861

faxing: (360) 407-6902

No. Explain why no statement was prepared

Does RCW 34.05.328 apply to this rule adoption?  Yes  No

Please explain: While the establishment of a compensatory wetland mitigation bank is voluntary, certified wetland banks could be subject to compliance enforcement if they are not in compliance with the terms of their certification. This could include suspension of the use of the bank's credits and/or use of financial assurances posted by the bank's sponsor.

## Chapter 173-700 WAC WETLAND MITIGATION BANKS

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**AR 002688**

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**AR 002690**

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## PART I

### OVERVIEW

**173-700-010 Background** (1) The Wetlands Mitigation Banking Act, Chapter 90.84 RCW, sets forth fundamental elements of a mitigation banking policy to ensure that a predictable, statewide process exists for certifying environmentally sound wetland mitigation banks.

(2) The act finds wetland mitigation banking an important regulatory tool for providing compensatory mitigation for unavoidable impacts to wetlands and declares it the policy of the state to support wetland mitigation banking. The act directs the department of ecology (the department) to adopt rules establishing a statewide process for certifying wetland mitigation banks.

(3) The department anticipates that wetland mitigation banks will provide some compensatory mitigation in advance of impacts to wetlands and will consolidate compensatory mitigation into larger contiguous areas for regionally significant ecological benefits.

(4) Wetland mitigation banks (banks) prioritize restoration of wetland functions and as such should be complementary to the restoration of ecosystems and ecosystem processes as identified in state or locally adopted science-based watershed management plans.

**173-700-020 Purpose** (1) This rule is intended to facilitate wetland mitigation banking by providing an efficient, predictable statewide framework for the certification and operation of environmentally sound wetland mitigation banks. In addition, this rule sets out to accomplish the following:

- (a) Provide a systematic approach for reviewing and approving environmentally sound wetland mitigation banks;
- (b) Provide for the timely review of bank proposals;
- (c) Establish coordination among state and local agencies involved in the certification and approval of banks;
- (d) Avoid duplication with federal processes by encouraging early involvement with federal agencies; and
- (e) Provide incentives to encourage bank sponsors to locate and design banks that provide the greatest ecological benefits.

(2) The purpose of this rule is to support the establishment of wetland mitigation banks as an important tool for providing compensatory wetland mitigation by authorizing state agencies, local governments and private entities to achieve the goals of the authorizing statute, Chapter 90.84 RCW.

**173-700-030 Integrating banks with watershed planning** (1) This rule should facilitate the establishment and operation of wetland mitigation banks that are integrated with local land-use plans and science-based watershed or sub-watershed management plans.

(2) Local and state agencies are encouraged to use wetland mitigation banks as a useful tool for implementing watershed management plans. Wetland banks can restore habitats and functions that are priorities within the watershed.

(3) Wetland banks should experience an expedited review process when they are established as part of a science-based resource management program, which has been endorsed by state and federal resource agencies.

**173-700-040 Applicability** This rule applies to private and public wetland mitigation banks established under Chapter 90.84 RCW.

## **PART II**

### **DEFINITIONS**

#### **173-700-100 Definitions**

**"Aquatic Resources"** means those areas where the presence and movement of water is a dominant process affecting their development, structure, and functioning. Aquatic resources may include, but are not limited to, vegetated and non-vegetated wetlands or aquatic sites (e.g. mudflats, deepwater habitats, lakes and streams).

**"As-built plans"** means a document, that describes the physical, biological and, if required, the chemical condition of a compensatory bank site after complete implementation of each phase of an approved construction plan.

**"Available credits"** means those credits that have been released by the department and can be used. Available credits do not include credits that have been debited (used for a permit requirement) from the bank.

**"Bank"** or **"wetland mitigation bank"** means a site where wetlands are restored, created, enhanced, or in exceptional circumstances, preserved, expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to aquatic resources.

**"Bank instrument"** means the documentation of agency and bank sponsor concurrence on the objectives and administration of the bank. The "bank instrument" describes in detail the physical and legal characteristics of the bank, including the service area, and how the bank will be established and operated.

**"Bank sponsor"** means any public or private entity responsible for establishing and, in most circumstances, operating a bank.

**"Buffer"** means those areas surrounding a bank site that enhance and protect a wetland's functions and values by maintaining adjacent habitat and reducing adverse impacts from adjacent land-uses.

**"Compensatory mitigation"** means the restoration, creation, enhancement or in exceptional circumstances, preservation of wetlands or other aquatic resources, or both, for the purpose of compensating for unavoidable adverse impacts to wetlands or other aquatic resources

which remain after all appropriate and practicable avoidance and minimization has been achieved.

**"Consensus"** means a process by which a group synthesizes its ideas and concerns to form a common collaborative agreement acceptable to all members. While the primary goal of consensus is to reach agreement on an issue by all parties, unanimity may not always be possible.

**"Contingency actions"** means actions taken during the operational life of a bank site to correct any deficiencies on the site in order for the site to attain the required performance standards.

**"Cowardin class"** means the classification of a wetland area as described in *Classification of Wetlands and Deepwater Habitats of the United States* USFWS publication FWS/OBS 79/31.

**"Creation"** means the establishment of wetland area, functions, and values in an area where none previously existed.

**"Credit"** means a unit of trade representing the increase in the ecological value of the site, as measured by acreage, functions, and values, or by some other assessment method.

**"Debit project"** means those projects that use credits from a wetland mitigation bank to fulfill regulatory requirements for compensation of impacts to aquatic resources. A debit project may require more than one regulatory approval under federal, state and local rules.

**"Department"** means the department of ecology.

**"Ecoregions"** means those areas that are considered to be regions of relative homogeneity in ecological systems or in relationships between organisms and their environments.

**"Enhancement"** means actions taken within an existing degraded wetland or other aquatic resource to increase or augment one or more functions or values. Enhancement can also include actions taken to improve the functions provided by a buffer or upland area.

**"Financial assurance"** means the money or other form of financial instrument (for example surety bonds, trust funds, escrow accounts, proof of stable revenue sources for public agencies) required of the sponsor to ensure that the functions of the subject bank are achieved and maintained over the long-term in accordance with the terms and conditions of the bank instrument.

**"Function assessment"** means an assessment of the degree to which a wetland is performing, or is capable of performing, specific wetland functions. Function assessments include the use of scientifically-based quantitative and qualitative methods developed for assessing functions, as well as the use of best professional judgement for determining the degree to which a wetland or other habitat is performing, or is capable of performing, specific functions.

**"Hydrogeomorphic (HGM) classification"** means a wetland classification scheme that groups wetlands based on their geomorphic setting and water regime.

**"Local jurisdiction"** means any local government such as a town, city, or county.

**"Mitigation"** means sequentially avoiding impacts, minimizing impacts, and compensating for remaining unavoidable impacts to wetlands.

"**Mitigation bank review team**" or "**MBRT**" means an interagency group of federal, state, tribal and local regulatory and resource agency representatives that are invited to participate in negotiations with the bank sponsor on the terms and conditions of the bank instrument.

"**Mitigation bank review team process**" or "**MBRT Process**" means a process in which the department strives to reach consensus with the MBRT members on the terms, conditions, and procedural elements of the bank instrument.

"**Operational life**" or "**operational life of a bank**" means the period during which the terms and conditions of the bank instrument are in effect. With the exception of arrangements for the long-term management, permanent protection, and financial assurances, the operational life of a mitigation bank terminates at the point when:

- (a) Compensatory mitigation credits have been exhausted and the debited bank is determined to be functionally mature and self-sustaining to the degree specified in the bank instrument; or
- (b) The bank sponsor voluntarily terminates the banking activity with written notice to the department.

"**Performance standards**" are measurable benchmarks for a specific project objective. Performance standards are usually designed to allow evaluation of the development of ecological characteristics associated with specific wetland functions.

"**Potential credits**" mean the credits anticipated to be provided at a bank site, but which are not available for use. Once potential credits are released by the department, they convert to available credits.

"**Practicable**" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

"**Preservation**" means the permanent protection of ecologically important wetlands or other aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection or enhancement of the aquatic systems, or both.

"**Prospectus**" is the conceptual proposal for a mitigation bank project.

"**Restoration**" means actions taken to intentionally re-establish wetland area, function and values at a site where wetlands previously existed, but are no longer present because of the lack of water or hydric soils. Restoration can also include the re-establishment of historic wetland HGM classes on sites that have been altered due to human activities to a different HGM class, and which are significantly degraded with low levels of functions and values.

"**Service area**" means the designated geographic area in which a bank can reasonably be expected to provide appropriate compensation for unavoidable impacts to wetlands.

"**Signatories**" means those entities that have documented their approval of the terms and conditions of the bank instrument through their signature on the bank instrument.

"**Sustainability**" means the ability of the aquatic system to be self-maintaining and self-regulating. Sustainable bank sites must have sufficient buffer areas to protect the site from degradations due to activities on adjacent lands.

"**Unavoidable**" means adverse impacts that remain after all appropriate and practicable avoidance and minimization have been achieved.

"**Water resource inventory areas**" or "**WRIA**" refers to the sixty-two water resource divisions of the state as described in Chapter 173-500 WAC, Water Resources Management Program Established Pursuant to the Water Resources Act of 1971, as amended.

"**Wetland**" or "**wetlands**" mean areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

"**Wetland mitigation bank**" or "**bank**" means a site where wetlands are restored, created, enhanced, or in exceptional circumstances, preserved, expressly for the purpose of providing compensatory mitigation in advance of authorized impacts to aquatic resources.

### **PART III**

#### **CERTIFICATION PROCESS**

**173-700-200 How does certification relate to other rules?** (1) Many federal, state, and local laws and rules and treaty rights relate to the establishment of a compensatory wetland mitigation bank.

(2) Mitigation banks certified under this rule must be consistent with existing federal, state and local laws and rules.

(3) Certification of a wetland bank does not serve as authorization for other federal, state or local permits or approvals.

(4) Mitigation Bank Review Team (MBRT) members shall advise the bank sponsor of pertinent federal state or local rules that may apply to a specific bank proposal and that may delay the certification process.

**173-700-201 Why have a certification process?** The department must certify banks to ensure that they are technically feasible, environmentally sound, and in compliance with this rule.

**173-700-202 Overview of the wetland mitigation bank certification process** (1) The certification process for wetland mitigation banks contains two parts. The first part is a pre-application process followed by a formal application process.

(2) The *pre-application process* begins when a bank sponsor submits a prospectus to the department.

(3) The department convenes a Mitigation Bank Review Team (MBRT) after determining that the prospectus contains sufficient information.

(4) The MBRT reviews and evaluates the bank prospectus and provides comments to the bank sponsor on the proposed bank.

(5) The bank sponsor develops a bank instrument using the comments provided by the MBRT on the prospectus.

(6) The *formal application process* begins when the bank sponsor submits a certification application and bank instrument to the department.

(7) The department determines if the application is complete.

(8) The department reconvenes the MBRT to review the complete application.

(9) The department begins the public comment period under WAC 173-700-232.

(10) The department issues a certification decision and notifies the local jurisdiction(s) in which the bank is located of that decision.

(11) The local jurisdiction(s) reviews the certification decision and determines whether it concurs with the department's decision.

(12) *Certification is complete* when the department, the local jurisdiction(s), and the bank sponsor all sign the bank instrument.

**173-700-203 Decision-making procedure** (1) All decisions rendered by the department must fully consider MBRT and public comments submitted as part of the certification evaluation process.

(2) The MBRT shall strive to achieve *consensus* on the terms and conditions of bank instruments.

(3) If the department determines that consensus cannot otherwise be reached on any term, condition, or procedural element of the bank instrument within a reasonable timeframe, the department shall be responsible for making final decisions regarding the terms and conditions of the bank instrument.

(4) Advisory members of the Mitigation Bank Review Team may participate in MBRT discussions, however they may not participate in the decision-making of the MBRT. See WAC 173-700-732.

**173-700-204 Dispute resolution** (1) In the event that the MBRT is unable to reach consensus on any element of the bank certification, the department shall initiate the dispute resolution procedure under WAC 173-700-205.

(2) The department shall make every effort to resolve disputes within the MBRT forum before the conflict is elevated to the program manager of the department's Shorelands and Environmental Assistance Program.

**173-700-205 Dispute resolution procedure** The department shall use the following dispute resolution procedure for resolving concerns from members of the MBRT.

(1) The MBRT member(s) who has concerns with a particular decision or element of a bank certification shall submit the concern and accompanying rationale in writing to the chair(s) of the MBRT.

(2) The chair(s) of the MBRT shall outline the majority position on the area of concern and shall work with the MBRT member(s) to develop potential solutions to the member's concerns.

(3) The chair(s) of the MBRT shall present potential solutions to the MBRT and the MBRT shall work to resolve the concern.

(4) In the event that the MBRT is unable to resolve the concern, the MBRT member with the concern shall secure and pay for a facilitator to assist the MBRT in resolving the conflict.

(5) In the event that the MBRT is still unable to reach consensus, the MBRT member with the concern may request, through written notification, that the department's program management reviews the issue. Such a notification must include:

- (a) A detailed description of the issue, and
- (b) Recommendations for resolution.

(6) The written notification must be directed to the program manager of the Shorelands and Environmental Assistance Program or the program manager's designee. Within twenty days of receipt of a notification, the program manager, or its designee, shall contact the MBRT member and shall make a final decision. The resolution shall be forwarded to the other MBRT members.

**173-700-220 Pre-application process** (1) The bank sponsor must submit a prospectus, consistent with the requirements in WAC 173-700-223, to the department.

(2) The department must determine whether the prospectus contains enough information to form a Mitigation Bank Review Team (MBRT).

(a) If the department determines that the prospectus is not sufficient: the department shall notify the bank sponsor and identify any additional information necessary to complete the prospectus.

(b) If the department determines that the prospectus is sufficient, the department shall notify the local jurisdiction(s) and invite it to co-chair the MBRT.

(c) If the prospectus is sufficient, the department must invite representatives from the appropriate federal, state, and local regulatory and resource agencies, and tribes to participate on the MBRT. The department may invite advisory members to the MBRT under WAC 173-700-732

(3) The bank sponsor must send the department enough copies of the prospectus for all of the members of the MBRT.

(4) At least two weeks before a MBRT meeting, the department must send the prospectus to all agencies and tribes participating on the MBRT.

**173-700-221 MBRT review of the prospectus** (1) The MBRT shall strive to meet within sixty days of when the department notifies it of a new bank prospectus.

(2) The MBRT must meet to evaluate the technical and regulatory feasibility of a prospectus.

(3) The members of the MBRT shall provide comments to the department and the bank sponsor on the bank prospectus. Comments should include:

- (a) The technical feasibility of the bank proposal;
- (b) Its compliance with existing rules and ordinances;
- (c) Any applicable permits or authorizations necessary for bank construction; and
- (d) Any additional information necessary for the draft bank instrument, such as supporting studies and other documentation.

(4) The bank sponsor must use the comments received from the MBRT to develop a bank instrument, which is consistent with the requirements in WAC 173-700-240 and WAC 173-700-241.

(5) After completing the bank instrument, the sponsor may formally apply for wetland bank certification under WAC 173-700-230.

**173-700-222 Purpose of the prospectus** (1) The purpose of the prospectus is to provide a conceptual plan for a wetland mitigation bank proposal.

(2) The prospectus initiates dialogue with the department and MBRT members on a proposed bank.

(3) A prospectus must contain sufficient information to allow the department and the MBRT to provide feedback to the bank sponsor on whether the bank project is technically feasible and complies with existing state and local rules. Necessary information includes discussions of the proposed goals and objectives, the construction, and operation of the proposed bank.

**173-700-223 Content of the prospectus** At a minimum, the prospectus must contain information on the following elements:

(1) The goals and objectives of the project;

(2) Site location information, including a detailed map with sufficient information to accurately identify site location, such as legal description and proximity to existing roads;

(3) The rationale for site selection addressing the considerations listed in WAC 173-700-320;

(4) A description of existing conditions of the proposed site(s) including, but not limited to:

- (a) Land ownership;
- (b) The landscape position of the site;
- (c) Site size;
- (d) Wetlands present on the site;



- (e) Other habitat types present on the site;
- (f) Available information on water sources, soils, and vegetation; and
- (g) A preliminary analysis of functions provided by on-site wetlands;

(5) Conceptual site design, including but not limited to:

- (a) Proposed types and approximate sizes of wetlands;
- (b) Other proposed habitat types to be provided on the site; and
- (c) Proposed functions that the bank is anticipated to provide;

(6) Potential adverse impacts to aquatic resources or other habitats from bank construction;

(7) Proposed service area and accompanying rationale that demonstrates that the service area is ecologically appropriate;

(8) Anticipated potential credits to be generated by the bank;

(9) Discussion of whether water rights have been applied for or secured for the site, if needed;

(10) Demonstration of adequate financial resources for the construction, operation, and long-term management of the bank site; and

(11) Description of proposed permanent protection mechanism, such as a conservation easement.

**173-700-224 Optional MBRT pre-application meetings** (1) If a bank sponsor wants assistance from the MBRT during the drafting of a bank instrument, the bank sponsor may request that the department schedule an additional meeting(s) with the MBRT.

(2) If additional meetings are requested, the bank sponsor must submit to the department a draft bank instrument, consistent with the requirements of WAC 173-700-241, and sufficient copies of the instrument for distribution to the MBRT members.

(3) The department must reconvene the MBRT if:

- (a) The sponsor requests another meeting with the MBRT;
- (b) The bank sponsor submits a complete draft bank instrument with sufficient copies for the MBRT members to the department; and
- (c) The department determines that the new draft bank instrument warrants another meeting with the MBRT.

(4) The MBRT shall provide comments to the department and the bank sponsor regarding any terms and conditions required for the bank instrument.

**173-700-230 Formal application phase** (1) The bank sponsor shall submit a complete certification application to the department.

(2) A complete application consists of the following:

- (a) A completed wetland bank certification application form;
- (b) A draft bank instrument consistent with the requirements of WAC 173-700-241;
- (c) A completed checklist under RCW Chapter 43.21C, the State Environmental Policy Act;

- (d) A Joint Aquatic Resources Permit Application (JARPA), if necessary; and
  - (e) Other supporting information as required by the department through the MBRT process.
- This supporting information may include, but is not limited to:
- (i) Financial assurance documents;
  - (ii) Legal mechanisms for the permanent protection of the bank site; and
  - (iii) Hydrologic and other ecological studies.

**173-700-231 What happens after an application is submitted?** (1) After receiving the application, the department shall determine whether the application is complete.

- (a) If the department determines that the application is not complete, the department shall notify the bank sponsor of its determination and identify any additional information that is necessary to complete the application.
- (b) If the department determines that the application is complete, the department shall notify the bank sponsor of its determination and assign a bank application number to the application.

(2) After the department notifies the bank sponsor that the application is complete, the bank sponsor must submit to the department sufficient copies of the draft bank instrument for distribution to MBRT members.

**173-700-232 Review of the application** (1) Upon determining the application is complete and after receiving sufficient copies of the bank instrument from the bank sponsor, the department must notify and reconvene the MBRT.

(2) After determining that the application is complete, the department must also initiate the public notification, review, and comment process under WAC 173-700-252 through WAC 173-700-255.

(3) The MBRT shall review the draft bank instrument and provide comments to the department and the bank sponsor on the technical requirements, terms, and conditions of the proposed certification.

**173-700-233 Department's certification decision** (1) After the public comment period closes and the MBRT has concluded the review of the proposal, the department must:

- (a) Notify the bank sponsor of all recommendations and comments received from the MBRT and the public;
- (b) Identify any additional information that the sponsor must submit in order for the department to make a certification decision; and
- (c) Identify additional terms and conditions required as part of the certification.

- (2) If the department requests additional information:
- (a) The certification process shall stop until the information is received and approved by the department; and

(b) The department may reconvene the MBRT or reopen the public comment period if the department determines that the bank instrument has changed substantially.

(3) After review of the application is complete, the department shall issue a certification decision.

(4) The department shall indicate its approval of certification by signing the bank instrument. After signing the bank instrument, the department must notify the local jurisdiction and request its concurrence on the certification.

(5) If the application is denied, the department must send a notification to the bank sponsor and to the local jurisdiction in which the proposed bank is located. The notification must state the reasons for denial.

**173-700-234 Local jurisdiction's certification decision** (1) After receipt of the department's decision to approve certification, the local jurisdiction(s) in which the bank will be located shall review the certification decision.

(2) If the local jurisdiction(s) concurs with the bank certification, it must sign the bank instrument.

(3) If the local jurisdiction(s) does not concur with the certification, the local jurisdiction must send a notification to the bank sponsor and the department of its decision. The notification must state the reasons for the local jurisdiction's non-concurrence.

(4) If the local jurisdiction(s) does not concur with the certification, the department may not certify the bank.

**173-700-235 Signatories of the bank instrument** (1) A bank instrument must contain signatures from the department, the local jurisdiction(s) in which the bank will be located, and the bank sponsor for certification to be complete.

(2) No agency, except for the department and the local jurisdiction in which the bank is located, is required to sign a bank instrument in order for certification to be complete. However, MBRT member agencies and tribes are encouraged to sign a bank instrument to document their concurrence with the terms and conditions of the certification.

(3) If any other agency or tribe signs the bank instrument, it shall signify that entity's concurrence with the terms of the bank instrument.

**173-700-240 The bank instrument** (1) A bank instrument details all of the physical characteristics, legal obligations, operational procedures, monitoring, and maintenance requirements for a wetland mitigation bank.

(2) Requirements for bank instruments vary based on the specific conditions of the bank site and should be developed in cooperation with the MBRT.

(3) The bank sponsor must develop the bank instrument using feedback from the MBRT on the prospectus and, if applicable, MBRT comments on a preliminary draft bank instrument.

**173-700-241 Contents of the bank instrument** The minimum elements required in the bank instrument are:

- (1) A statement of bank goals and objectives;
- (2) Documentation of the ownership of bank lands, including a legal description and map of the bank site and surrounding areas;
- (3) A detailed description of bank sponsor responsibilities for construction implementation, monitoring and reporting, maintenance, and credit tracking and reporting;
- (4) A description and map of the geographic service area;
- (5) The potential number of credits to be generated by the bank and a credit description consistent with WAC 173-700-350;
- (6) A description of the types of impacts to wetlands or other aquatic resources suitable for compensation and any restrictions on uses of credits;
- (7) A detailed description of the proposed bank including, but not limited to:
  - (a) The bank size;
  - (b) The landscape position of the site;
  - (c) The Cowardin and HGM classes and sizes of wetlands and aquatic resources proposed for the bank;
  - (d) A description of the buffers for the site and any other habitats provided on the site;
  - (e) The functions and values to be provided by the bank;
  - (f) Detailed site design plans and specifications to include grading plans, planting plans, and specifications for any structures; and
  - (g) Construction timing and schedules;
- (8) A description of existing ecological baseline conditions at the bank site, including supporting documentation requested by the department, through the MBRT process. The description must include, at a minimum:
  - (a) Technical data on water sources and soils;
  - (b) Wetlands present on the site;
  - (c) Other habitat types present on the site;
  - (d) Existing vegetation communities; and
  - (e) Analysis of functions provided by on-site wetlands;
- (9) Documentation of water rights for the proposed bank, if required;
- (10) Credit tracking and accounting procedures, including reporting requirements;
- (11) Performance standards for determining credit release and bank success, including a schedule for the phased release of credits;
- (12) Reporting protocols and monitoring plan, including a clear statement of responsibility for conducting monitoring and for reporting;
- (13) A contingency plan and statement of responsibility for contingency actions;
- (14) Appropriate financial assurances;

(15) Provisions for short-term and long-term management and maintenance, including a description of anticipated management and maintenance activities;

(16) Provisions for permanent protection of the property on which the bank will be located; and

(17) Force Majeure Clause (identification of sponsor responsibilities in the event of catastrophic events that are beyond the sponsor's control).

**173-700-250 Public involvement** (1) It is the department's goal to ensure that accurate certification information is made available to the public in a timely manner, and to avoid duplicative processes for public involvement.

**173-700-251 Public outreach** Applicants are strongly encouraged to solicit public input during the pre-application phase of bank certification.

**173-700-252 Joint public notices** (1) The department shall use existing public processes, whenever possible, to obtain public comment on a proposed bank certification. When an existing process is available to solicit public comment on a certification, the department shall strive to provide a joint public notice.

(2) The public notice for bank certification must include the information under WAC 173-700-253 and WAC 173-700-254.

(3) When an existing public notification process for the proposal is not available, the department shall issue a public notice on the proposed bank certification under WAC 173-700-253 through WAC 173-700-255.

**173-700-253 Notifying the public of certification applications** The department must notify the public of an application for certification. Public notice for the wetland bank certification shall include:

(1) Name and address of the department staff contact for information on the certification application;

(2) Name and address of the bank sponsor;

(3) A description of the bank proposal including, but not limited to, the following information:

(a) The location of the proposed bank site;

(b) The types of wetlands to be restored, enhanced, created or preserved on the bank site;

(c) The number and types of credits proposed;

(d) The service area proposed for the bank; and

(e) The credit release schedule proposed for the bank;

(4) Name, address, and telephone number of a person from whom interested persons may obtain further information, such as copies of the application, the draft bank instrument and supporting materials; and

(5) A brief description of the comment procedures, including:

- (a) The time and place of any hearings scheduled for the certification;
- (b) Where comments should be sent;
- (c) The closing date for receiving comments; and
- (d) The procedures to request a hearing.

**173-700-254 Who is notified of an application?** At a minimum, the department shall notify the following members of the public of the application for certification:

(1) Local and tribal governments located within the proposed service area, other interested persons and organizations that have requested information on wetland bank certifications, and all others deemed appropriate by the department;

(2) The latest recorded real property owners located within 300 feet of the boundaries of the property upon which the wetland bank site is proposed, as shown by the records of the county treasurer; and

(3) The general public within a bank's proposed service area through:

- (a) A published notice in a newspaper of general circulation in the service area of the proposed bank and in other counties as deemed appropriate, and
- (b) A notice posted in a conspicuous manner on the property upon which the proposed bank is to be located.

**173-700-255 Length of comment period** (1) The department must provide at least thirty-days for the public comment.

(2) Wetland banks that require an environmental impact statement may need longer comment periods.

(3) The comment period may be extended if the department holds a public hearing for a wetland bank proposal.

**173-700-256 Requesting a public hearing** (1) The bank sponsor, any interested government entity, any group or any person may request, in writing, a public hearing on the bank certification.

(2) The request must be received by the department before the end of the comment period specified on the public notice.

(3) Any request for a public hearing shall indicate the interest of the party filing it and why a hearing is warranted.

**173-700-257 When is a public hearing held?** (1) The department shall determine, in its sole discretion, if significant public interest exists to hold a public hearing.

(2) The department shall provide at least fourteen calendar days prior notice of any hearing.

**173-700-258 Public records** (1) The department must make available for public inspection the certification application, draft bank instrument and other supporting materials.

(2) The department shall keep a record of the comments received by the department and issues raised during the public participation process on the bank certification. Those records are available to the public.

(3) The department may not render a certification decision until the public comment period is complete.

#### **PART IV**

#### **BANK ESTABLISHMENT – TECHNICAL REQUIREMENTS**

**173-700-300 Ecological design incentives** (1) One of the goals of the wetland banking certification program is to encourage banks that provide significant ecological benefits. In order to achieve this, incentives have been built into the certification and bank establishment process to encourage the siting and designing of banks that provide significant ecological benefits.

(2) The incentives include, but are not limited to, more favorable credit conversion rates, higher releases of credits, and larger service areas. For each of these elements, banks that satisfy more of the decision-making criteria or that satisfy those criteria to a higher degree generally receive more favorable conditions. The department, through the MBRT process, shall make decisions regarding the application of specific incentives on a case-by-case basis.

(3) Bank sponsors should consult the following sections of this rule for criteria that the department shall use for its decision-making:

(a) Determining the amount of credit generated by a bank site under WAC 173-700-355 and WAC 173-700-357;

(b) The designation of service areas under WAC 173-700-311; and

(c) The scheduling of credit releases under WAC 173-700-372 through WAC 173-700-375.

(4) The department shall encourage, with better credit conversion rates, banks that include restoration of wetland systems and banks that provide significant habitat value because they provide connections or corridors to other natural areas.

**173-700-310 Service area** (1) The department, through the MBRT process, must determine the appropriate service area for proposed banks.

(2) The bank sponsor must describe and include a map of the bank's proposed service area in the draft bank instrument.

(3) The extent of the service area must be based on the functions provided by the bank and the distance from the bank site that the ecological functions can reasonably be expected to compensate for impacts to wetlands. The department must consider the

hydrologic and biotic criteria as identified in WAC 173-700-311 when designating a service area.

**173-700-311 Criteria for determining service area size** The size of a service area must be determined based on the following elements:

- (1) The functions provided by the bank;
- (2) Whether and how far the ecological and hydrological benefits of the bank extend beyond the bank site location;
- (3) The landscape position of the bank site within the watershed;
- (4) The WRIA in which the bank is located;
- (5) The ecoregion in which the requested service area is located;
- (6) The ecological sustainability of the bank site;
- (7) The quality, diversity, and regional significance of the habitats provided;
- (8) Local needs and requirements, such as consistency with land-use or watershed management plans;
- (9) Consideration of the types of impacts to wetlands or other aquatic resources that may be compensated through the use of credits from the banks; and
- (10) Available information on baseline conditions in the requested service area such as that found in watershed management plans, function assessments, wetland mapping or inventories, storm water management plans, and comprehensive land use plans.

**173-700-320 Site selection** (1) Mitigation banks must be planned and designed to be self-sustaining over time. The department and the MBRT shall carefully consider ecological sustainability and suitability when determining if a site is an appropriate location for a mitigation bank.

- (2) Considerations shall include, but are not limited to:
- (a) Whether the site includes areas that can be restored to wetland conditions;
  - (b) Whether the site possesses the physical, chemical and biological characteristics to support the bank goals and objectives;
  - (c) Whether the size and location of the bank is appropriate relative to the ecological features found at the site, such as sources of water;
  - (d) If the bank sponsor has obtained any necessary water rights for the site, if necessary;
  - (e) The wetland functions and values that the site has the potential to provide;
  - (f) Whether the bank site can provide increased or improved wetland functions and restore ecological processes within the basin or the watershed;
  - (g) If the bank site has a high potential to connect or complement existing wetlands;
  - (h) The types of unavoidable impacts that are anticipated to use bank credits for compensatory mitigation;



- (i) Whether the site and bank objectives are compatible with surrounding land-uses lying both up and down gradient;
- (j) Whether the bank site can be protected over time from direct, indirect, and cumulative impacts due to current and foreseeable future land-uses;
- (k) Whether the bank site is consistent with existing planning documents, such as watershed, zoning, or comprehensive land-use plans and critical areas rules;
- (l) Whether the bank site contributes to the improvement of identified management problems within the drainage basin or watershed, such as sedimentation, water quality degradation, or flood control;
- (m) What the historical land-uses were at that site;
- (n) The presence and quantity of invasive species on the site;
- (o) The existence of a native seed bank on the site;
- (p) Whether the process of establishing the bank at the site will compromise ecologically significant aquatic or upland resources, cultural sites, or habitat for threatened, endangered, or candidate species; and
- (q) The degree of long-term maintenance necessary for the site.

(3) The establishment and use of mitigation banks in or adjacent to areas of national, state, or regional ecological significance is encouraged if the establishment and operation of the mitigation bank does not compromise the protection or functioning of the ecologically significant areas.

**173-700-330 Assessment of wetland functions** (1) The sponsor must assess the ecological functions provided by the bank site based on a method specified in the bank instrument.

(2) The department may require a sponsor to use either a "best professional judgement" method for assessing wetland functions or a specific regional function assessment method

**173-700-340 Minimum buffers** (1) The department, through the MBRT process, must determine a minimum buffer necessary for each bank. The minimum buffer for a bank must be sufficient to protect and enhance the functions at the bank.

(2) The department must consider the following criteria when it determines a minimum buffer for a bank:

- (a) The quality of the wetlands in the bank and the level of sensitivity of the wetlands to off-site activities;
- (b) The functions to be provided by the bank;
- (c) The quality of the buffer, (existing conditions and proposed conditions);
- (d) The functions that the buffer needs to provide; and
- (e) The intensity of adjacent land-uses.

(2) Minimum buffers shall generally range between 50 and 300 feet in width.

(3) The minimum buffer does not generate credit.

(4) The bank sponsor must provide at least the minimum buffer required by the department.

**173-700-350 Credit description.** The bank sponsor must provide a description of what the bank credits represent in the bank instrument.

(1) For credits determined using a conversion rate under WAC 173-700-353, the bank sponsor shall describe the credits in terms of acreage of: the wetland rating category; hydrogeomorphic (HGM) class, and Cowardin class of wetland. The credit description must list the ecological functions provided by the bank.

(2) For credits determined using an alternative method under WAC 173-700-359, the bank sponsor shall describe, in the bank instrument, the method used to determine the credits and what the credits represent.

**173-700-351 Types of credits** (1) There are three stages in the life of a mitigation bank credit:

- (a) Potential credit;
- (b) Available credit; and
- (c) Debited credit.

(2) Credits are initially called potential credits because while they are anticipated to be generated by the bank, they do not actually exist until the bank meets specific performance standards. After a bank attains the performance standards specified in the bank instrument and the department releases a potential credit, then that credit becomes an available credit.

(3) Only available credits can be used to meet permit requirements.

**173-700-352 Determination of credits** (1) Credits may be generated at a bank site through the restoration, creation, enhancement, or preservation of wetlands or a combination thereof.

(2) Preservation alone may generate credits under WAC 173-700-360.

(3) Buffer areas, beyond the minimum required under WAC 173-700-340, and upland habitats may generate credits to the extent that those areas contribute to the overall ecological functioning and sustainability of the bank.

(4) The department must give priority to the restoration of degraded or former wetlands when determining credits.

(5) The method for credit determination must be the same for the life of the bank.

(6) Debits and credits must be determined using the same method and be in the same unit of "currency".

**173-700-353 Default method for determining credits.** (1) The department shall use acreage of wetland as the default credit unit for calculating credits at a bank site.

(2) The department, through the MBRT process, shall determine the number of potential credits at a bank using a credit conversion rate.

(3) The credit conversion rate uses a ratio of acre-credits generated at the bank site to acres of activity such as restoration, creation, enhancement or preservation:  
(Acre-credit : Acres of activity).

(4) Except as provided in WAC 173-700-358, the department must determine the credit conversion rates for individual banks from within the ranges specified in this subsection.

(5) This section and WAC 173-700-354 through WAC 173-700-358 do not apply to banks using an alternative method to determine credits under WAC 173-700-359.

**173-700-354 Wetland credit conversion rates** The ranges for establishing conversion rates for wetland areas are as follows:

If the mitigation activity is:	The conversion rate can range from:  Acre credit : Acre mit. activity
Restoration	1:1 to 1:2
Creation	1:1 to 1:5
Enhancement	1:2 to 1:6
Preservation:  In combination with restoration or creation of wetlands	1:2 to 1:10
Preservation alone	1:5 to 1:20

**173-700-355 Criteria for determining conversion rates for wetlands** Unless an alternate credit determination method is used under WAC 173-700-359, the department, through the MBRT process, shall use the following criteria to determine specific conversion rates for wetlands on a bank site:

- (1) The anticipated net gains in wetland functions at the bank site;
- (2) The quality of the wetlands and habitats at the bank site;
- (3) The rarity of the wetlands and habitats at the bank site;
- (4) The degree to which the bank provides functions that are degraded or limited in a watershed;
- (5) The habitat value of the bank site;

(6) The site's contribution to the protection or recovery, or both, of state or federally listed threatened or endangered species, protection of state priority species and habitats, and locally significant habitats;

(7) The size, quality, and functioning of the buffers for the site;

(8) The degree of connectivity to other habitats and open space areas;

(9) The likelihood of the successful implementation of the site design and successful performance of the targeted wetland functions;

(10) The quality of supporting information provided; and,

(11) Public education and access, if ecologically appropriate.

**173-700-356 Conversion rates for uplands and buffer areas** (1) Buffers provided above and beyond the minimum buffer required under WAC 173-700-340 are eligible to generate credit. Such buffer areas are called eligible buffers.

(2) Eligible buffers and other upland habitats may generate credits at a conversion rate from 1:5 to 1:20.

**173-700-357 Criteria for determining conversion rates for uplands and eligible buffer areas** Unless an alternate credit determination method is used under WAC 173-700-359, the department, through the MBRT process, shall use the following criteria to determine specific conversion rates for uplands and eligible buffers on a bank site:

(1) Degree of contribution to the ecological functioning of the bank;

(2) The adequacy of the area to perform the desired function(s);

(3) Adjacent land uses including foreseeable future land uses; and

(4) Connectivity to other habitats and open space areas.

**173-700-358 Exceptions to credit conversion ranges** (1) The department, through the MBRT process, may allow a conversion rate for wetlands or non-wetland areas that are outside of the ranges specified in WAC 173-700-354 and WAC 173-700-356.

(2) All exceptions for credit conversion rates authorized by the department must be:

(a) Made on a case-by-case basis, considering the specific circumstances of a bank; and

(b) Based on ecological considerations.

**173-700-359 Using an alternative method to calculate credits** The department may allow the use of an alternative method to determine credits so long as:

(1) The department, through the MBRT process, approves of the method;

(2) The method is applicable and appropriate for the Pacific Northwest;

- (3) The method is applicable for use on projects debiting from the bank; and
- (4) The same method is applied to the bank throughout the operational life of the bank.

**173-700-360 Credits for preservation** (1) Preserving wetlands or associated uplands may generate credit when the preservation occurs in conjunction with the restoration, enhancement, or creation of a wetland.

(2) Preservation of wetlands as the sole means of generating credits may be approved in exceptional circumstances by the department, through the MBRT process if:

- (a) The area proposed for preservation is a high quality system; and
- (b) The area proposed for preservation is at risk because the wetland is under demonstrable threat of loss, or substantial degradation, due to human activities that might not otherwise be expected to be restricted.

**173-700-361 Determining high quality wetland systems** (1) The department shall determine whether a site is a high quality system for preservation when the preservation is the only credit-generating activity in a bank.

(2) The factors that the department must consider in making this determination include whether the wetland:

- (a) Has a Category I or II wetland rating (Category III only in exceptional cases);
- (b) Is a rare wetland type;
- (c) Provides habitat for threatened or endangered species;
- (d) Is located in a floodway, or in a portion of a floodplain that is documented as a frequently flooded area, or is providing flood retention and storage;
- (e) Provides biological or hydrological connectivity or both;
- (f) Is of high regional or watershed importance, such as listed as a priority site in a watershed plan; or
- (g) Contains high native species diversity.

**173-700-370 Schedule for the release of credits** (1) Releases of credits must be tied to the attainment of performance standards (See WAC 173-700-380) specified in the bank instrument.

(2) The department, through the MBRT process, shall determine a schedule for the release of credits at individual banks.

(3) The department must determine the number of credits to be released when the bank attains specific performance standards.

(4) The department shall base the number of credits to be released on, but not limited to, the following criteria:

- (a) The amount of ecological gain at the time of the release;
- (b) The bank sponsor's experience and success with similar types of wetland projects;

- (c) The expected length of time necessary to achieve project goals for wetland function performance and wetland types; and
- (d) The possibility of design failure.

(5) The bank sponsor shall include in the bank instrument the schedule for release of credits at the attainment of specific performance standards, and the amount of credit available for each release.

**173-700-371 Limits on credit releases** (1) The credit-release schedule and amount of credits eligible for release may not exceed the maximum amounts under WAC 173-700-372 through WAC 173-700-375.

(2) The department must release credits when it concurs that the bank has attained all of the performance standards required for a specific release.

(3) The maximum percentages of credits able to be released under WAC 173-700-372 through WAC 173-700-374 do not include credits generated by preservation of wetlands.

(4) The department, through the MBRT process, may release potential credits generated by the preservation of existing wetlands or aquatic resources after the minimum requirements specified in WAC 173-700-372 have been met.

**173-700-372 Credit release - pre-construction** (1) The department, through the MBRT process, must determine if it is appropriate to allow credits to be released from a wetland mitigation bank before a bank is constructed. The department must determine whether to allow pre-construction releases of credits on a case-by-case basis, which considers the particular ecological and economic circumstances of each bank.

(2) Initial physical and biological improvements must be completed within one year following the initial release of credits.

(3) The following criteria must be met prior to any release of credits:

- (a) The bank instrument is signed and approved;
- (b) The permanent protection mechanism and financial assurances are established; and
- (c) Ownership of the bank site is secured.

**173-700-373 Credit release – after construction** (1) Up to forty percent of the total potential credits may be released when the department, in consultation with signatory agencies, approves:

- (a) The complete implementation of construction plans; and
- (b) The as-built condition of the bank.

(2) Approval of the as-built condition of a bank includes the following steps:

- (a) The bank sponsor must submit, to the department, the final as-built plans that reflect the final grading and planting of the bank site, and sufficient copies of the final as-built plans for the bank's signatories;
- (b) The department must review the final as-built plans;

(b) The department, or its designee, must inspect the as-built condition of the bank. The department shall invite the bank's signatories and other interested members of the MBRT to inspect the as-built condition of the bank; and

(c) If the department approves of the as-built plans and the constructed condition of the site, then the department must release the amount credit specified in the bank instrument.

**173-700-374 Credit release – Attainment of hydrologic performance standards**

(1) Up to fifty percent of total potential credits may be released when the department, in consultation with signatory agencies, determines that the hydrologic performance standard(s), at a minimum, has been attained.

(2) The department, through the MBRT process, may require that additional performance standards be met prior to releasing up to fifty percent of the total potential credits.

**173-700-375 Credit release - Final release** (1) The department may not release all of the potential credits until the bank has fully attained all of the performance standards specified in the bank instrument.

(2) After a bank site has successfully attained all of its performance standards and the department concurs that all performance standards have been attained, the department must release all remaining potential credits.

**173-700-376 Additional credit releases** (1) Releases of credits earlier than those specified in the bank instrument may be approved by the department, in consultation with the signatories, as long as the maximum percentages for the release of potential credits specified in WAC 173-700-372 through WAC 173-700-375 are not exceeded.

(2) Earlier releases of credits may be warranted if the department, in consultation with the signatories, requests the sponsor to perform actions beyond those identified in the bank instrument in order to increase the projected functions of the site. Implementation of management activities that are necessary to attain the performance standards required in the bank instrument are not included.

(3) An addendum to the bank instrument shall document any deviation from the credit release schedule.

**173-700-380 Performance standards** (1) The bank sponsor must specify the bank's performance standards in the bank instrument.

(2) Performance standards must be based on the objectives and goals of the bank identified in the bank instrument and linked to a specific objective.

(3) Performance standards must identify measurable values for variables linked to specific objectives.

(4) The department, through the MBRT process, may require multiple years of monitoring data to document the sustainable attainment of specific performance standards, particularly hydrologic performance standards.

(5) A bank is considered fully successful when all of the performance standards specified in the bank instrument have been attained.

**173-700-390 Financial responsibility** (1) Certification of a wetland mitigation bank under this rule does not imply or guarantee the financial viability of the wetland mitigation bank.

(2) Bank sponsors are responsible for conducting any financial studies prior to implementation of a bank instrument to determine the financial risks and potential economic viability of the bank.

(3) The department may not consider the economic standing or condition of a bank when implementing mitigation sequencing, determining unavoidable impacts, or evaluating compensation alternatives for debit projects.

**173-700-391 Financial assurances.** (1) The department, through the MBRT process, must require that financial assurances be posted to ensure that the potential risks to the environment from unsuccessful mitigation banks are minimized.

(2) The department must determine the amount of financial assurances required on a bank-specific basis.

(3) The amount of financial assurances required by the department must be commensurate with the degree of risk of bank failure and the nature and extent of site alteration and development.

(3) The department may reduce the amounts of posted financial assurances over the operational life of the bank as the bank matures and the risk of failure is reduced.

(4) The bank instrument and the financial assurance mechanisms must specify the financial requirements and conditions, and the entity responsible for the release or cashing of the financial assurances.

(5) The department must determine the adequacy of the proposed financial assurances prior to certification.

**173-700-392 Levels of financial assurances** The department may require all of the following levels of financial assurances for mitigation banks:

(1) Financial assurances for construction of the bank site;

(2) Financial assurances for short-term management of the bank (see WAC 173-700-420);

and

(3) Financial assurances for long-term management of the bank (see WAC 173-700-421).



**173-700-393 Financial assurances for construction.** (1) When credits are released prior to the construction of a wetland mitigation bank, a financial assurance sufficient to cover the anticipated costs of construction shall be required prior to any release of credits.

(2) The amount of the financial assurance must be sufficient to cover the estimated costs for construction plus the costs for contract administration and overhead.

(3) Construction cost estimates must be based on the costs of having an independent contractor perform the construction of the bank. The sponsor must provide the department with two written estimates from qualified contractors.

(4) The department shall authorize the release of the financial assurance mechanism for bank construction after the department has approved the as-built condition of the bank.

(5) Banks may be developed in phases as specified in the bank instrument. If any credits are released prior to the construction of the bank or a phase of the bank, the department must require a financial assurance sufficient to cover the costs of construction of that phase plus administrative costs incurred by the department.

(6) The department may not require a financial assurance for construction if the first release of credits for a bank after the bank has been constructed and the department has approved the as-builts.

**173-700-394 Financial assurances for short-term management.** (1) The department must require a financial assurance for short-term management (See WAC 173-700-420) for all banks that have credit releases prior to full attainment of all performance standards.

(2) The amount of the financial assurance must be sufficient to cover all short-term maintenance activities under WAC 173-700-420 for the operational life of the bank.

(3) The cost estimates for short-term management must be based on the costs to have the applicable work in subsection (5) of this section performed by an independent contractor.

(4) The sponsor shall provide the department with two written estimates from qualified contractors.

(5) Monitoring and maintenance expenses used to determine the amount of the short-term management financial assurance may include, but are not limited to:

a) Estimated costs for a contractor to implement the contingency actions identified in the bank instrument;

b) Estimated costs of all monitoring activities required in the monitoring plan for the bank as specified in the bank instrument;

(c) Costs to implement the site plan, such as irrigation, control of invasive species, or phased planting; and

(d) Estimated costs for management activities required during the operational life of the bank as specified in the bank instrument (e.g. control of invasive vegetation or phased plantings), plus department costs for contract administration and overhead.

**173-700-395 Financial assurances for long-term management** (1) The department must require a financial assurance for the long-term management (see WAC 173-700-421) of a wetland bank site.

(2) The bank sponsor must secure sufficient funds for the anticipated long-term management costs as required by the department.

(3) The purpose of the long-term financial assurance is to ensure that the long-term manager or owner of a bank site has the financial resources available to perform the minimum responsibilities of any real property owner and ensure that the bank site remains in its natural condition.

(4) These responsibilities may include but are not limited to:

- (a) Payment of property taxes;
- (b) Control of noxious weeds;
- (c) Maintenance of structures such as water control structures, fences, trails or signs; and
- (d) Other long-term management activities required in the bank instrument.

(5) The bank sponsor must provide department with two estimates for the costs of annual maintenance of the bank site.

(6) If the ownership of the site is transferred in the future, the financial mechanism for long-term management must remain with the entity responsible for the long-term management of the bank.

## **PART V**

### **OPERATION OF BANKS**

**173-700-400 Monitoring** The goals of monitoring bank sites are to:

- (1) Document the post-construction baseline conditions at the bank site;
- (2) Document the condition of the bank site as it develops over time;
- (3) Document the attainment of performance standards; and
- (4) Provide early identification of problems in the site's development to trigger potential contingency actions.

**173-700-401 Monitoring plan** (1) The bank sponsor must develop a monitoring plan for each bank site and include it in the bank instrument.

(2) The monitoring plan must include:

- (a) A list of the bank's performance standards;
- (b) A description of the variables that will be monitored and how they will be evaluated;
- (c) A description of the methods or protocols used to monitor the identified variables;
- (d) A schedule of monitoring including details regarding the time of year, frequency, and duration;
- (e) A description of proposed photo documentation of the site; and

(f) A detailed contingency plan as outlined in WAC 173-700-402.

**173-700-402 Contingency plan** (1) Each bank instrument must include a contingency plan in case the bank fails to attain any performance standards.

(2) The contingency plan for a bank site must include the following elements:

- (a) Identification of potential causes for site failure;
- (b) Alternatives for contingency actions that may be required if the monitoring indicates that the site will not achieve specific performance standards; and
- (c) The bank sponsor's responsibilities in reporting and implementing contingency actions.

**173-700-403 Duration of monitoring** (1) The bank sponsor must monitor the wetland bank for at least five years.

(2) The department, through the MBRT process, shall determine a monitoring schedule for the bank that is of sufficient duration to show that the bank is progressing toward ecological success and sustainability. For example, longer monitoring periods may be required for banks that contain wetland systems that require more time to reach a stable condition (e.g. forested wetlands and estuarine restoration).

(3) The department may require additional monitoring at bank sites where contingency actions have been undertaken.

**173-700-404 Monitoring reports** (1) The bank sponsor must submit to the department monitoring reports that document the conditions and progress of the bank's development. Those reports must be submitted according to the schedule documented in the bank instrument.

(2) The monitoring report must identify by name and qualification the persons and organizations conducting the monitoring and must contain all data necessary to document compliance with performance standards and the bank instrument.

(3) The report must include, but is not limited to:

- (a) Photo points or referenced locations where photographs of the site are taken periodically to document site progress;
- (b) Data collected during the monitoring;
- (c) A narrative summary of the results of the monitoring;
- (d) Discussion of whether applicable performance standards were attained;
- (e) Discussion of recommended management activities to improve attainment of performance standards or performance of functions at the site;
- (f) Identification of any probable causes for failure of the bank to attain any performance standards; and
- (g) Recommendations for contingency actions, if applicable.

**173-700-405 As-built reporting** (1) Within sixty days after the completion of grading or planting, or both, the bank sponsor must submit to the department a post-construction report documenting the "as-built" conditions of the site.

(2) The bank sponsor must identify in the as-built report any variations from the site design plan approved in the bank instrument.

**173-700-410 Obtaining credit releases** (1) In order to obtain a release of credits, a bank sponsor must petition the department in writing for a credit release once the bank has met the required performance standards.

(2) The bank sponsor must send the department the petition and must include supporting documentation that the required performance standards have been met.

(3) The department must respond to the petition within thirty days of receipt of the written petition and supporting documents.

(4) The department, or its designee, may conduct an on-site inspection to verify that performance standards have been met. Bank signatories and members of the MBRT are encouraged to participate in the on-site visits.

(5) The bank sponsor must allow the department access to the site and to all documentation relevant to the requested credit release.

(6) The department must grant the release of credits upon its approval of the attainment of the required performance standards.

**173-700-411 Recording credit transactions** (1) When an available credit is debited from a bank, the bank sponsor must record each credit withdrawal transaction at the auditor's office of the county in which the bank is located.

(2) Any recording fees or other costs are the responsibility of the sponsor.

(3) Each credit withdrawal transaction must include the following:

- (a) The wetland mitigation bank application number assigned by the department;
- (b) Name of the person or entity purchasing credits;
- (c) Location of the debit project that is approved to use bank credits as compensation;
- (d) Debit project permit numbers and types;
- (e) Debit project impact acreage and wetland types; and
- (f) Date and number of credits sold or used.

(4) The bank sponsor must submit a copy of the recorded transaction to the department within thirty days of the auditor's office recording of each withdrawal transaction.

**173-700-412 Accounting and tracking of credit transactions** (1) The bank sponsor must maintain a separate credit -tracking ledger for each wetland mitigation bank that the sponsor develops.

(2) The bank sponsor must document all credit transactions in the credit-tracking ledger and maintain copies of all credit withdrawal transactions.

**173-700-413 Credit-tracking ledger** The credit-tracking ledger must include the following information:

- (1) Bank sponsor or owner name and contact information;
- (2) Wetland mitigation bank application number assigned by the department;
- (3) Legal description of the bank location;
- (4) Construction date of the bank;
- (5) Wetland types and target functions of the bank;
- (6) Dates and amounts of all petitions for release of credits;
- (7) A balance of all potential credits;
- (8) A balance of all available credits; and
- 9) Dates, amounts, and supporting information as listed in WAC 173-700-411 for all withdrawal transactions.

**173-700-414 Annual account reporting** (1) By the end of February of each year, the bank sponsor must submit to the department an annual transaction report.

(2) The annual transaction report must include a complete copy of the credit-tracking ledger and, if requested by the department, copies of all credit transactions from the previous calendar year.

**173-700-415 Master ledger** (1) The department shall maintain a master ledger for each bank and must cross check the bank sponsor's annual transaction report against the master ledger.

(2) The department must notify the bank sponsor within sixty days of receipt of the sponsor's annual report if that report conflicts with the master ledger.

(3) The bank sponsor is responsible for reconciling any discrepancies between the bank sponsor's credit-tracking ledger and the department's master ledger. If the bank sponsor fails to resolve any discrepancies, the department may suspend the further use of available credits under WAC 173-700-630.

**173-700-416 Random audits** (1) The department may conduct random audits during the operational life of a bank.

(2) The audit may include the department contacting the local jurisdiction(s) and the county auditor's office to verify all transactions listed in a bank's credit-tracking ledger.

(3) In the event of an audit, the bank sponsor must provide all supporting documentation requested by the department in order to verify transactions listed in the bank's credit tracking ledger.

(4) Unexplainable discrepancies between the public records and the bank's credit tracking ledger may result in the department initiating compliance actions under WAC 173-700-600 through WAC 173-700-630.

**173-700-420 Short-term management** (1) Short-term management includes all activities and actions necessary to ensure the successful development of a wetland bank.

(2) The period of short-term maintenance includes the entire operational life of the bank.

(3) Short-term management includes, but is not limited to, the following activities:

(a) Actions necessary to implement the site plan such as, but not limited to, irrigation, control of invasive species, and phased plantings;

(b) Regular monitoring of the site as described in the monitoring plan for the bank under WAC 173-700-401;

(c) Ongoing maintenance activities required during the operational life of the bank as specified in the bank instrument. For example, a bank may require regular control of invasive species or maintenance of a water control structure; and

(d) Implementation of contingency actions, if required.

**173-700-421 Long-term management** (1) The bank sponsor must provide long-term management of the bank in order to maintain the wetland bank in its natural state.

(2) The bank sponsor must describe in the bank instrument any anticipated management and maintenance activities.

(3) The long-term maintenance and management activities may include, but are not limited to:

(a) Noxious weed control and removal of invasive species as needed;

(b) Repair and maintenance of any structures on the site;

(c) Repair due to vandalism; and

(d) Tax assessments, utility fees, or other costs for the property on which the wetland bank is located.

(4) The sponsor must identify the long-term manager of the wetland bank either in the bank instrument or the conservation easement, or both.

(5) The department shall require a signed contract or agreement between the department and the long-term manager for the bank. That contract must specify the role and responsibilities of the long-term manager of the site(s).

(6) The owner of a wetland bank may not complete any conveyance of title, easement, lease, or other interest directly related to the wetland bank without adequate and complete provision for the continued management of the wetland bank in a natural state.

**173-700-422 Permanent protection** (1) Wetland bank sites must be permanently protected and preserved in their natural state. The department shall require that the bank sponsor use institutional controls to ensure the long-term protection and preservation of the bank site.

(2) Institution controls include:

(a) Legal and administrative mechanisms to limit site activities that are incompatible with the goals and purposes of the site. Examples include, but are not limited to, placing a conservation easement on the bank site and designating a long-term manager or steward for the bank;

(b) Physical measures to minimize adverse impacts to the wetland and its biotic community such as erecting signs, fencing, vehicle barriers, and designated trails; and

(c) Establishment of an endowment or trust for the long-term management of the site.

(3) Real estate arrangements must be approved by the department and secured prior to any release of credits. The real estate arrangements must transfer with the property.

**173-700-423 Conservation easements for wetland banks** The conservation easement for a wetland bank must:

(1) Prohibit alterations to the wetland bank that may interfere with the ecological functioning of the bank;

(2) Require the long-term manager of the wetland bank to notify the department if the owner conveys any interest in the wetland bank;

(3) Require the long-term manager of the wetland bank to notify the department and receive approval from the department for any proposal to use the wetland bank in a manner that is inconsistent with the conservation easement;

(4) Grant the department and its designated representatives the right to enter the wetland bank at reasonable times for the purpose of evaluating compliance with the terms of the bank instrument and the conservation easement; and

(5) Require the owner to include in any instrument conveying any interest in any portion of the wetland bank, notice of the conservation easement under this section.

## PART VI

### USE OF WETLAND BANK CREDITS

**173-700-500 Available credits** (1) Potential credits at a bank site that have been released by the department are referred to as "available credits".

(2) An available credit may be used to provide compensation for unavoidable wetland impacts authorized under a federal, state, or local permit in accordance with the conditions of the bank certification and approved bank instrument.

(3) Permitting agencies for debit projects are responsible for determining if the use of available credits from a bank provides appropriate compensation for the debit project's unavoidable impacts.

**173-700-501 Projects eligible to use a bank** (1) Projects located within the bank's service area are eligible to apply to use credits from that bank for compensation.

**173-700-502 Replacement ratios for debit projects** (1) Replacement ratios used to determine compensation requirements for debit projects that use bank credits should generally be lower than those required for project-specific concurrent mitigation.

(2) The replacement ratios for debit projects should take into consideration that credit conversion rates for wetland banks include adjustments for the site's overall ecological benefit. Therefore, one acre-credit at a bank is not necessarily equal to one acre on the ground. In many cases one acre-credit from a bank represents more than one acre at the bank site.

(3) Replacement ratios for debit projects should reflect:

- (a) The existing risk of failure at the time credits are debited;
- (b) Any temporal losses;
- (c) Out-of-kind considerations; and
- (d) Compensation for the distance from the affected wetland to the bank site.

(4) Recommended replacement ratios for debit projects may be specified in a bank instrument.

**173-700-503 Use of credits for fish habitat and hydrologic functions** (1) Impacts to hydrologic functions and fish habitat may not be mitigated with credits from a bank that is located in a different WRIA from the impact site, unless the permitting agency(ies) determines that the use of credits from a bank is appropriate, and consistent with all other applicable laws, including but not limited to the Endangered Species Act and local recovery plans.

(2) Generally, impacts to salmonid fish habitat and hydrologic functions should be mitigated in the same stream reach or sub-basin, respectively, as the impact site.

**173-700-504 Use of credits outside of the service area** (1) The department, in consultation with the bank's signatories, may authorize the use of mitigation bank credits to compensate for impacts outside of the bank's designated service area if the department deems that use to be practicable and environmentally desirable.

(2) When a debit project located outside of the bank's designated service area requests to use bank credits as compensation for an authorized wetland impact, the bank sponsor must:



- (a) Use the posted financial assurances to have the required contingency actions completed;  
or
- (b) Adjust the total number of potential credits at the bank under WAC 173-700-620.

(6) The department shall send a copy of the non-compliance notification to the bank's signatories.

(7) Thirty days after the date of the bank sponsor's receipt of the department's notification in subsection (5) of this section, the department may initiate the actions specified in the notification.

**173-700-620 Adjustments in total credits** (1) The department may adjust the final number of credits available at a bank based on actual conditions of the bank site at the time of the final release of credits.

(2) The department shall consult with a bank's signatories to determine whether the number of credits at a bank should be adjusted at the time of the final release of credits.

(3) The department may adjust the number of credits at a bank in the following ways:

(a) The department, in consultation with the bank signatories, may reduce total number of credits at a bank site if all of the required performance standards cannot be attained;

(b) The department, in consultation with the bank signatories, may increase the number of credits available at a bank site if:

(i) All of the required performance standards are met; and

(ii) The department determines that the site provides higher levels of function than was originally projected; or

(c) After the department concurs that all of the required performance standards have been met, the department may recalculate the remaining available restoration and creation credits to achieve a conversion rate of one to one. The revised conversion rates for restoration or creation credits should be based on the criteria listed in WAC173-700-355.

**173-700-630 Suspension of credit use** (1) The department may suspend a bank's use of credits to bring a bank into compliance. If the department suspends the use of credits, credits may not be debited until the department lifts the suspension.

(2) The suspension shall include all available credits at a bank.

(3) The department may suspend the use of available credits for the following reasons:

(a) If the department determines that a bank is out of compliance with the terms of its certification and the sponsor has not implemented the contingency actions required by the department;

(b) If the department determines that a bank is not in compliance with the terms of its certification and that the sponsor has not made reasonable efforts to bring the bank into compliance; or

(c) If the department determines that there is documented fraudulent use of the bank.

(4) If credit use is suspended by the department, the department must notify the bank sponsor by certified mail with return receipt requested that further use of credits has been suspended.

(5) The department shall maintain the suspension until compliance is achieved.

(6) The use of credits shall remain suspended until the department notifies the bank sponsor in writing that credit use may be resumed.

## **PART VIII**

### **ROLES AND RESPONSIBILITIES**

**173-700-700 Responsibilities of the bank sponsor** (1) The bank sponsor must meet the requirements of these rules.

(2) It is the responsibility of the bank sponsor to provide the wetland mitigation prospectus and bank instrument consistent with WAC 173-700-223 and 173-700-241, respectively.

(3) It is the bank sponsor's responsibility to incorporate specific elements required by the department and the MBRT into the final bank instrument.

(3) The bank sponsor is responsible for obtaining all required federal, state, and local permits and approvals for the construction and establishment of the wetland mitigation bank.

(4) The bank sponsor is responsible for assuring the success of the restoration, creation, enhancement, or preservation activities, or a combination of these activities, at the mitigation bank.

(5) The bank sponsor is responsible for the construction, operation, maintenance, permanent protection, and all costs including contingency actions, if required, and financial assurances for the mitigation bank in accordance with the bank instrument and this rule.

(6) The bank sponsor must secure adequate funds for the operation and maintenance of the bank during its operational life and the long-term management and permanent protection of the bank sites.

(7) The bank sponsor must secure real estate arrangements that will permanently protect the property on which the bank is located.

(8) The bank sponsor is responsible for the evaluation and protection of historic, cultural, and archeological resources of the bank site.

(9) The bank sponsor must monitor the development of the bank site and report findings to the department under WAC 173-700-404.

(10) The bank sponsor is responsible for submitting written petitions for releases of credits under WAC 173-700-410.

(11) The bank sponsor is responsible for the accounting and maintenance of ledgers regarding the deposit and withdrawal of credits from the mitigation bank under WAC 173-700-412 and WAC 173-700-413.

- (a) Provide written notice of the proposed use of credits and a request for comments to the department and the bank's signatories;
- (b) Convene a meeting of the signatory agencies, if necessary;
- (c) Obtain written approval from the department and the bank's signatories on the proposed use of credits;
- (d) Send copies of the approvals to the department; and
- (e) Include the approval documents as an addendum to the bank instrument.

(3) Linear projects, such as roadways, transmission lines, distribution lines, pipelines, or railways, may be eligible to use a bank even though all of the projects' impacts are not located within the bank's service area. However, the following conditions must be met:

- (a) At least one impact from the project must lie within the bank's service area;
- (b) The bank must provide appropriate compensation for the impacts; and
- (c) The determination to allow use of bank credits for impacts lying outside of a bank's service area must take into consideration the elements used in determining the bank's service area as listed in WAC 173-700-311.

**173-700-505 Use of credits for more than one permit** (1) A credit must only be used to compensate for one authorized impact to wetlands or aquatic resources. Once a credit has been used (debited), it may not be used as compensation for a different wetland impact authorized under a another regulatory program.

(2) Some debit projects may require authorization under more than one regulatory program, (e.g. Section 404 authorization, local grading permit and a hydraulic project approval). A credit can be used to compensate for one impact that requires multiple authorizations for the same impact.

## **PART VII**

### **COMPLIANCE WITH CERTIFICATION**

**173-700-600 Compliance with the terms of certification** (1) It is the department's goal to ensure that the establishment and operation of a mitigation bank is consistent with the terms and conditions of the certification as specified in the bank instrument. The department may use one or more of the methods provided for in WAC 173-700-610 through WAC 173-700-630 to gain compliance of certified banks.

**173-700-610 Contingency actions** (1) If a bank is unable to attain the required performance standards specified in the bank instrument, the department may require that the sponsor implement contingency actions necessary to correct any site deficiencies.

(2) Upon the bank sponsor's determination that the bank is not or will not attain performance standards, the bank sponsor shall notify the department and the bank's signatories that the bank site will not attain the required performance standards.

(3) Any agency, entity, or person may also notify the department if it has supporting documentation that a bank site is not successfully meeting the required performance standards.

(4) The notification must include:

- (a) A clear statement of the problem;
- (b) Supporting documentation of the problem, such as photographic evidence, documentation from field reviews, the submitted monitoring report or the credit release petition; and
- (c) Recommendations for contingency actions or other alternatives to address the problem.

(5) The department, with recommendations from the bank's signatories, shall evaluate and determine the appropriate contingency actions required for the site. The department's determination for contingency action(s) must include:

- (a) A description of the contingency action(s) that must be undertaken;
- (b) A schedule for the sponsor to implement the required contingency action(s);
- (c) Any additional monitoring and reporting requirements for the bank, if applicable ; and
- (d) Any adjustments to the credits in the wetland bank and the credit release schedule.

(6) Interested signatories of the bank shall notify the department if they have comments on the proposed contingency actions as specified in WAC 173-700-740.

**173-700-611 Notice of required contingency actions** (1) The department must submit, in writing, its determination on required contingency actions to the bank sponsor and the bank's signatories.

(2) This determination must be attached as an addendum to the bank instrument.

**173-700-612 Compliance with required contingency actions** (1) If the bank sponsor does not complete the required contingency actions within the schedule specified in the department's determination for contingency actions, the department must notify the bank sponsor that it is out of compliance with the contingency requirements.

(2) The department must send the notification of non-compliance by certified mail with return receipt requested and must require a written response from the sponsor.

(3) The sponsor must respond in writing to the department within fifteen days of receipt of the non-compliance notification. The response shall include an explanation of why the sponsor has not implemented the required contingency actions and a schedule for when the sponsor will complete the required contingency actions.

(4) The department, in consultation with interested signatories of the bank, shall determine whether the reasons provided by the sponsor constitute extenuating circumstances and shall determine whether to extend the schedule for instituting contingency actions.

(5) If the department determines that the schedule should not be extended, the department must notify the sponsor by certified mail with return receipt requested that it intends to either:

(12) The bank sponsor is responsible for obtaining all approvals for the bank's signatories when proposing to use credits in a manner that is inconsistent with the terms and conditions of the bank instrument.

(13) The bank sponsor may request the program manager of the Shorelands and Environmental Assistance Program to review actions taken to develop the bank instrument if the sponsor believes that a particular decision raises concern regarding the application of this rule, or that inadequate progress has been made by the MBRT on the bank instrument.

**173-700-710 Role of the department** (1) The department is responsible for making the final decision on bank certifications.

(2) The department must fully consider recommendations from the MBRT and public comments submitted as part of the certification process.

(3) The department is responsible for inviting members to and convening the MBRT. The department must serve as chair of the MBRT and shall invite the local jurisdiction to serve as co-chair.

(4) The department is responsible for maintaining master ledgers on certified banks and authorizing the release of credits as specified in bank instruments under WAC 173-700-415 and WAC 173-700-410, respectively.

(5) The department shall be responsible for approving financial assurances, and releasing financial assurances or cashing posted financial assurances to ensure compliance with the terms of a bank instrument.

(6) The department shall implement the compliance procedures as described in WAC 173-700-600 through WAC 173-700-630 if a bank is determined to be out of compliance with the terms of its certification.

(7) The department must determine the requirements for implementation of contingency actions when a bank is unable to attain its performance standards.

(8) If the sponsor does not achieve compliance with the terms of the bank instrument within the timeframe specified by the department, the department may suspend the use of credits as described in WAC 173-700-630.

**173-700-720 Role of local jurisdiction(s)** (1) For the purposes of this section, local jurisdiction(s) means the local jurisdiction(s) where the wetland bank site is located.

(2) The local jurisdiction(s) shall be invited by the department to participate on the MBRT.

(3) The local jurisdiction(s) may participate as co-chair of the MBRT with the department.

(4) After receipt of the department's decision to approve certification, the local jurisdiction(s) must review the certification and if it concurs with the decision, the local jurisdiction(s) must sign the bank instrument to indicate its concurrence with the bank certification.

**173-700-730 Role of the mitigation bank review team** (1) The purposes of a Mitigation Bank Review Team (MBRT) are to:

- (a) Assist in the development of bank instruments;
- (b) Facilitate the review of wetland mitigation bank proposals; and
- (c) Avoid duplicative processes for bank certification and approval.

(2) It is the role of the MBRT to help ensure that certified wetland banks are technically feasible and ecologically desirable.

**173-700-731 Mitigation bank review team responsibilities** (1) The MBRT shall participate in negotiations with a bank sponsor on the terms of a bank instrument.

(2) The MBRT shall review certification applications, and propose recommendations to the department, and the local jurisdiction(s) where the bank is located, on the certification of individual mitigation banks.

(3) MBRT representatives are responsible for notifying the department if they have comments for the department to consider on the requirements for contingency actions or on the release of credits.

**173-700-732 Mitigation bank review team membership** (1) The MBRT is composed of a maximum of 15 members representing agencies with an interest in the bank, including the department, the local jurisdiction(s), and appropriate representatives from federal, state, and local regulatory and resource agencies and tribes.

(2) Entities typically invited include, but are not limited to, the US Army Corps of Engineers, the Environmental Protection Agency, US Fish and Wildlife Service, National Marine Fisheries Service, Natural Resource Conservation Service, Washington Department of Fish and Wildlife, Washington Department of Natural Resources, tribes, and local jurisdictions within the proposed bank's service area.

(3) The department may invite interested members of the public or non-governmental organizations to participate on the MBRT as advisory members.

(4) The department shall serve as chair of the MBRT and shall invite the local jurisdiction(s) where the bank is located to serve as co-chair. For bank proposals seeking federal approvals in addition to state certification, the U.S. Army Corps of Engineers representative may also co-chair the MBRT.

**173-700-740 Role of the banks' signatories** (1) Signatory agencies for a bank are responsible for providing assistance to the department in overseeing the establishment and operations of that bank.

(2) Signatory agencies must notify the department if they determine that the bank is out of compliance with the terms of its certification and recommend whether compliance actions are warranted to bring the bank into compliance.

(3) Signatory agencies are encouraged to participate in field reviews of the bank site for determining:

- (a) Whether the as-built condition of the bank is correct;
- (b) Whether contingency actions need to be initiated on a bank site and what those actions should include; and

(c) Whether a credit release petition should be granted.

(4) Signatory agencies shall notify the department if they have any comments regarding the department's proposed contingency actions required under WAC 173-700-610.

(5) Signatory agencies should review and provide comments to the department on any proposed uses of bank credits that are inconsistent with the terms of the certification.

**173-700-750 Role of permitting agencies authorizing use of credits** (1) Permitting agencies should document that mitigation sequencing has occurred before approving the use of banking credits to compensate for unavoidable impacts.

(2) The purpose of the documentation is to ensure that the intent of the authorizing statute is met. The authorizing statute states that bank credits should only be used for remaining "unavoidable" impacts after all practicable avoidance and minimization has been implemented.

(3) The rationale used to conclude that the actions are unavoidable should be included in the permit file for the debit project using bank credits for compensation.

## **PART IX**

### **APPEALS**

**173-700-800 Appeals process** (1) A decision to issue, deny, or modify a final certification may be appealed to the pollution control hearings board under RCW Chapter 43.21B.

**Attachment F**

**1993 SUPPLEMENT TO NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN  
WETLANDS: NORTHWEST (REGION 9)**





US Army Corps  
of Engineers  
Seattle District

Regulatory Branch  
Post Office Box 3755  
Seattle, Washington 98124-2255  
Telephone (206) 764-3495

# Special

# Public Notice

Public Notice Date: 31 March 1994

T. J. Stetz, Environmental Analyst

## SPECIAL INFORMATIONAL PUBLIC NOTICE

### 1993 SUPPLEMENT TO NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS: NORTHWEST (REGION 9)

In May 1992, the Northwest Interagency Review Panel, composed of members from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, the Environmental Protection Agency, and the Soil Conservation Service, considered written comments from reviewers on 361 plant species. Most of these plants were on the National List of Plant Species That Occur in Wetlands: Northwest (Region 9)/Biological Report 88 (26.9) as published by the U.S. Fish and Wildlife Service in May 1988. Of the 361 species, 292 were changed in indicator status or added to the list. A copy of the 1993 Supplement to List of Plant Species That Occur in Wetlands: Northwest (Region 9) dated December 1993 is attached. For plant species not in the 1993 Northwest Supplement, the 1988 Northwest List remains the appropriate list to use.

Additional copies of the supplement may be acquired by contacting:

U.S. Fish and Wildlife Service  
Portland Eastside Federal Complex  
911 Northeast 11th Avenue  
Portland, Oregon 97232-4181  
Telephone (503) 231-6154

Copies of the National List may be obtained from:

National Technical Information Service  
5285 Port Royal Road  
Springfield, Virginia 22161  
Telephone (703) 487-4650

Use of the supplement will become effective the date of this public notice. All delineation reports, whether currently at the District Offices or submitted after this date will be reviewed using the 1988 Northwest List with the 1993 Supplement of Plant Species That Occur in Wetlands.

Questions regarding the appropriate list use in other regions of the northwest (States of Oregon, Idaho, Montana, and Wyoming (approximately

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west of the continental divide) should be directed to the U.S. Army Corps of Engineers district office maintaining regulatory responsibility for that particular area.

LOCATION - States of Oregon, Washington, Idaho, Montana, and Wyoming (approximately west of the continental divide).

PURPOSE - Distribution and announcement of availability of supplement to northwest plant list and regulatory use.

AUTHORITY - This action pertains to activities proposed under Section 401 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899.

POINT OF CONTACT - In Washington:

T. J. Stetz, Environmental Analyst  
U.S. Army Corps of Engineers, Seattle District  
Post Office Box 3755  
Seattle, Washington 98124-2255  
Telephone (206) 764-3495

1993 SUPPLEMENT  
TO  
LIST OF PLANT SPECIES THAT OCCUR IN WETLANDS:  
NORTHWEST (REGION 9)

BY

PORTER B. REED JR.  
U.S. FISH AND WILDLIFE SERVICE

IN COOPERATION WITH

DENNIS PETERS  
U.S. FISH AND WILDLIFE SERVICE

JIM GOUDZWAARD  
U.S. ARMY CORPS OF ENGINEERS

IVAN LINES  
U.S. SOIL CONSERVATION SERVICE

FRED WEINMANN  
U.S. ENVIRONMENTAL PROTECTION AGENCY

December 1993

Supplement To  
Biological Report  
88(26.9) May 1988

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This 1993 Supplement changes or adds indicator status for 292 species to the "List of Plant Species That Occur in Wetlands: Northwest (Region 9)", May 1988, Biological Report 88 (26.9). The species are alphabetized by scientific name followed by the northwest regional indicator and common name.

For plant species not in the 1993 Northwest Supplement, the 1988 Northwest List remains the appropriate list to use.

In May, 1992, the Northwest Interagency Review Panel (NWIRP) considered written comments from reviewers on 361 species, most of which were in the 1988 Northwest List. Reviewers are listed in the appendix. Of the 361 species reviewed, 292 were changed in indicator or added to the list.

Indicators used are:

OBL	Obligate Wetland Species
FACW	Facultative Wetland Species
FAC	Facultative Species
FACU	Facultative Upland Species
UPL	Upland Species
NI	No Indicator Assigned

A positive (+) or negative (-) sign, when used with indicators, attempts to more specifically define the frequency of occurrence in wetlands. The positive sign indicates "slightly more frequently found in wetlands" and the negative sign indicates "slightly less frequently found in wetlands".

An asterisk (\*) following a regional indicator in the 1993 Northwest Supplement identifies a tentative assignment based upon either limited information or conflicting reviews. The asterisk is intended to encourage submission of additional field review information.

The Northwest List will remain dynamic and submission of well documented reviews based on field experiences are encouraged. The NWIRP anticipates an annual review in mid-winter of recommended revisions received since the last supplement. A complete submission, including description and explanation of the variety of field sites and/or data which supports each submission, is required. Recommended changes submitted without supporting data will not be considered. For review procedures and fuller descriptions of indicator categories refer to the 1988 Northwest List.

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The 1993 Northwest Supplement is endorsed by the NWIRP:

Dennis Peters  
U.S. Fish and Wildlife Service  
Portland Eastside Federal Complex  
911 NE 11th. Avenue  
Portland, OR 97232-4181

Jim Goudzwaard  
U.S. Army Corps of Engineers, Portland District  
Regulatory and Environmental Resource Branch  
Resource Protection and Fish and Wildlife Section  
P.O. Box 2946  
Portland, OR 97208-2946

Ivan Lines  
U.S.D.A., Soil Conservation Service  
Rock Pointe Tower II, Suite 450  
W. 316 Boone  
Spokane, WA 99201

Fred Weinmann  
U.S. Environmental Protection Agency  
Region 10  
1200 Sixth Avenue  
Seattle, WA 98101

Porter B. Reed (Coordinator/Compiler)  
U.S. Fish and Wildlife Service  
National Wetlands Inventory  
Suite 101, Monroe Building  
9720 Executive Center Drive  
St. Petersburg, FL 33702

Publication of a revised "National List of Plant Species That Occur in Wetlands: 1988 National Summary" is anticipated in 1995. This revised List is expected to follow the taxonomy in a new synonymized checklist of the North American flora to be published by John Kartesz in 1994.

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APPENDIX

1993 Northwest Supplement (Region 9)  
December 1993

Supplement To  
Biological Report  
88 (26.9) May 1988

Reviewers who provided submissions for consideration during the 1992 review by the Northwest Interagency Review Panel.

Antieau, Clayton  
1308 N.W. 83rd  
Seattle, WA 98117

Duebendorfer, Tom  
8921 188th Street, S.E.  
Snohomish, WA 98290

Black, Gerry  
Environmental Protection Specialist  
U.S. Army Corps of Engineers,  
Portland District  
Route 5, Box 30  
Astoria, OR 97103-9308

Ewing, Kern  
18242 24th Avenue, N.E.  
Seattle, WA 98155

Fries, Mary  
620 North "C" Street  
Tacoma, WA 98403

Chaney, Marty  
USDA, Soil Conservation Service  
Evergreen Plaza Bldg., Room 502  
711 Capitol Way  
Olympia, WA 98501-1278

Gamon, John  
Washington Dept. of Natural Resources  
Natural Heritage Program  
P.O. Box 47047  
Olympia, WA 98504-7047

Chappell, Christopher  
Tocoma, WA

Gooley, Ed  
U.S. Army Corps of Engineers  
P.O. Box 809  
Riverton, WY 82501

Colebrook, Binda  
3560 Alm Road  
Everson, WA 98247

Halse, Richard  
Dept. of Botany & Plant Pathology  
University of Oregon  
Cordley Hall 4082  
Corvallis, OR 97331

Cooke, Sarah  
PENTEC  
120 West Dayton, Suite A27  
Edmonds, WA 98020

Crawford, Rex  
Washington Natural  
Heritage Program  
Olympia, WA 98501

Hartley, Jamie  
Sheldon Associates  
P.O. Box 22052  
Seattle, WA 98122

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Howard, Ester  
B-Twelve Assoc.  
7015 Brighton Lane, South  
Seattle, WA 98118

Kelly, Val  
Raedeke Assoc.  
Scientific Con.  
5711 NE 63rd Street  
Seattle, WA 98115

Kovalchik, Bud  
U.S. Forest Service  
765 Main Street  
Colville, WA 99114

Leshner, Robin  
U.S. Forest Service  
21905 64th Avenue N.W.  
Mountlake Terrace, WA 98043

Lightcap, Brian  
U.S. Army Corps of Engineers  
Portland District  
P.O. Box 2946  
Portland, OR 97208-2946

Marshall, John  
U.S. Fish and Wildlife Service  
Portland Field Office  
2600 SE 98th Avenue, Suite 100  
Portland, OR 97266

Maxwell, Cathy  
HCR 78, Box 432  
Naselle, WA 98638

Peter, David  
Olympia, WA 98501

Pierce, John  
USDA, Forest Service  
Northern Region  
200 E. Broadway  
Missoula, MT 59809

Pointel, Marc  
Bureau of Land Management  
Tonopah, NV

Potash, Laura  
U.S. Forest Service  
21905 64th Avenue NW  
Mountlake Terrace, WA 98043

Rosenberger, Karin  
413 N. Brady Street  
Bozeman, MT

Sayce, Kathleen  
P.O. Box 91  
Nahcotta, WA 98637

Sheldon, Dyanne  
Sheldon Associates  
5031 University Way N.E.  
Number 5  
Seattle, WA 98105

Stevens, Michelle  
522 Oesk Drive  
Davis, CA 95616

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SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
ABIES GRANDIS (DOUGL. EX D.DON) LINDL.	FACU-*	FIR, GRAND
ACER CIRCINATUM PURSH	FAC-	MAPLE, VINE
AGOSERIS AURANTIACA (HOOK.) GREENE	FACU	FALSE-DANDELION, ORANGE-FLO.
AGOSERIS GLAUCA (PURSH) D. DIETR.	FAC-	FALSE-DANDELION, PALE
AGROPYRON REPENS (L.) BEAUV.	FAC-	QUACKGRASS
AGROPYRON SPICATUM (PURSH) SCRIBN. & J.G. SMITH	UPL	WHEATGRASS, BLUE-BUNCH
AGROSTIS ALBA L.	FAC*	REDTOP
AGROSTIS IDAHOENSIS NASH	FACW-	BENTGRASS, IDAHO
AGROSTIS ROSSIAE VASEY	NI	BENTGRASS, ROSS'
AGROSTIS STOLONIFERA L.	FAC*	BENTGRASS, SPREADING
AGROSTIS STOLONIFERA L. VAR. PALUSTRIS (HUDS.) FARW.	FACW*	BENTGRASS, CREEPING
AGROSTIS TENUIS SIBTH.	FAC	BENTGRASS, COLONIAL
ALNUS CRISPA (DRYAND. IN AIT.) PURSH	FACW*	ALDER, GREEN
ALOPECURUS ARUNDINACEUS POIR.	FAC*	FOXTAIL, CREEPING
ALOPECURUS GENICULATUS L.	OBL	FOXTAIL, MEADOW
AMORPHA FRUTICOSA L.	FACW	INDIGO-BUSH, FALSE
ANGELICA LUCIDA L.	FAC+	ANGELICA, SEAWATCH
ANTENNARIA ARCUATA CRONO.	FACW*	PUSSY-TOES, ALBERTA
ANTENNARIA CORYMBOSA E. NELS.	FAC*	PUSSY-TOES, FLAT-TOP
ARMERIA MARITIMA WILLO.	FAC*	THRIFT, WESTERN
ARTEMISIA CANA PURSH	FACU*	SAGEBRUSH, SILVER
ARTEMISIA LONGILOBA (OSTERH.) A.A. BEETLE	UPL	SAGE, LONG-LEAF
ARTEMISIA LUDOVICIANA NUTT.	FACU-*	SAGEBRUSH, WHITE
ASARUM CAUDATUM LINDL.	FACU*	GINGER, LONG-TAIL WILD
ASTER ALPIGENUS (TORR. & GRAY) GRAY	FAC*	ASTER, ANDERSON'S
ASTRAGALUS BOOINII SHELTON	FACW*	MILKVETCH, BOOIN'S
ASTRAGALUS LEPTALEUS GRAY	OBL*	MILKVETCH, PARK
ATRIPLEX ROSEA L.	FACU	ORACHE, TUMBLING
BETULA PAPYRIFERA MARSHALL	FAC*	BIRCH, PAPER
BETULA PENDULA ROTH	FACW*	BIRCH, EUROPEAN WEeping
BOTRYCHIUM SIMPLEX E. HITCHC.	FAC*	GRAPEFERN, LEAST
BOTRYCHIUM VIRGINIANUM (L.) SWARTZ	FAC*	FERN, RATTLESNAKE
BOYKINIA ELATA (NUTT.) GREENE	FAC	BROOKFOAM, SANTA LUCIA
BROMUS CILIATUS L.	FAC*	BROME, FRINGED
BROMUS JAPONICUS THUNB.	UPL	BROME, JAPANESE
BROMUS RUBENS L.	FACU*	BROME, RIPGUT
BROMUS VULGARIS (HOOK.) SHEAR	UPL	BROME, COLUMBIA
CALAMAGROSTIS SCOPULORUM M.E. JONES	FAC*	REEDGRASS, DITCH
CAMASSIA QUAMASH (PURSH) GREENE	FACW*	CAMASSIA, COMMON
CAPSELLA BURSA-PASTORIS (L.) MEDIC.	FACU	SHEPHERD'S-PURSE COMMON
CARDAMINE OLIGOSPERMA NUTT.	FAC	BITTER-CRESS, FEW-SEED
CAREX ABORIGINUM M.E. JONES	OBL*	SEDGE, INDIAN VALLEY
CAREX AENAE FERNALD	FACW*	SEDGE, BRONZE
CAREX ARCTA BOOTT	OBL	SEDGE, NORTHERN CLUSTERED
CAREX CRAWFORDII FERNALD	FAC	SEDGE, CRAWFORD'S
CAREX DEWEYANA SCHWEINITZ	FACU*	SEDGE, SHORT-SCALE
CAREX HENDERSONII L.H. BAILEY	FAC	SEDGE, HENDERSON'S
CAREX HOODII BOOTT	FAC	SEDGE, HOOD'S
CAREX LEPORINA L.	FACW	SEDGE, HARE'S-FOOT
CAREX MERTENSII PRESCOTT	FAC	SEDGE, MERTEN'S
CAREX NOVA L.H. BAILEY	FAC*	SEDGE, NEW

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SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
CAREX PANSA L.H. BAILEY	FAC*	SEDGE, SAND-DUNE
CAREX PSEUDOSCIRPOIDEA RYDB.	FAC*	SEDGE, WESTERN SINGLE-SPIKE
CAREX ROSTRATA J. STOKES VAR. UTRICULATA (BOOTT) BAILEY	OBL	SEDGE, NORTHWEST TERRITORY
CAREX SARTWELLII DEWEY	OBL	SEDGE, SARTWELL'S
CAREX SCIRPOIDEA MICHX.	FAC*	SEDGE, CANADIAN SINGLE-SPIKE
CAREX SPECTABILIS DEWEY	FACW*	SEDGE, SHOWY
CAREX TENERA DEWEY	FACW*	SEDGE, SLENDER
CAREX TUMULICOLA MACKENZ.	FACU*	SEDGE, FOOTHILL
CEANOTHUS SANGUINEUS PURSH	UPL	CEANOTHUS, RED-STEM
CENTAURIUM UMBELLATUM GILTB. EX FERNALD	FAC	CENTAURY
CIRCAEA ALPINA L.	FAC+	ENCHANTER'S-NIGHTSHADE SMALL
CIRSIIUM EDULE NUTT.	FAC	THISTLE, EDIBLE
CLAYTONIA CORDIFOLIA S. WATS.	FAC	SPRINGBEAUTY, HEART-LEAF
CLAYTONIA SIBIRICA L.	FAC	SPRINGBEAUTY, SIBERIAN
CLEMATIS LIGUSTICIFOLIA NUTT.	FAC-	VIRGIN'S-BOWER, WESTERN
CONIOSELINUM CHINENSE (L.) B.S.P.	FACW	HEMLOCK-PARSLEY
CONIUM MACULATUM L.	FAC+	POISON-HEMLOCK
CORALLORRHIZA MACULATA (RAF.) RAF.	UPL	CORALROOT, SPOTTED
CORNUS CANADENSIS L.	FAC	BUNCHBERRY, CANADA
CORYLUS CORNUTA MARSHALL	FACU	HAZEL-NUT, BEAKED
CYRATAEGUS MONOGYNA JACO.	FACU+*	HAWTHORN, ONE-SEED
CYRIS CAPILLARIS (L.) WALL R.	FACU*	HAWK'S-BEARD, SMOOTH
CRYPISIS ALOPECUROIDES (PILLER & MITTERP.) SCHRAD.	OBL*	TIMOTHY, FOX-TAIL
CYNOGLOSSUM OFFICINALE L.	FACU*	GYPSY-FLOWER
CYPRIPEDIUM FASCICULATUM KELLOGG EX S. WATS.	FACU	LADY'S-SLIPPER, CLUSTERED
DANTHONIA CALIFORNICA BOLAND.	FACU*	OATGRASS, CALIFORNIA
DICENTRA FORMOSA (ANDR.) WALPERS	FACU*	BLEEDINGHEARTS, PACIFIC
DICHLANTHELIUM OLIGOSANTHES (J.A. SCHULTES) GOULD	FACU*	WITCHGRASS, HELLER'S
DIGITALIS PURPUREA L.	FACU*	FOXGLOVE, PURPLE
DIPSACUS SYLVESTRIS HUDS.	FAC	TEASEL
DOECATHEON CONJUGENS GREENE	FACU	SHOOTING-STAR, BONNEVILLE
DOECATHEON JEFFREYI VAN HOUTTE	FACW+	SHOOTING-STAR, JEFFREY'S
DRABA AUREA VAHL EX HORNEH.	FACU*	WHITLOW-GRASS, GOLDEN
DRYOPTERIS CAMPYLOPTERA (KUNZE) E.H. CLARKSON	NI	FERN, MOUNTAIN WOOD
LEOCHARIS BOLANDERI GRAY	FACW+	SPIKERUSH, BOLANDER'S
ELYMUS CINEREUS SCRIBN. & MERRILL	FAC	WILD-RYE, BASIN
EMPILOBIUM LATIFOLIUM L.	FACW	BEAUTY, RIVER
PIPACTIS GIGANTEA DOUGL. EX HOOK.	OBL	HELLOBORINE, GIANT
ERIGERON PEREGRINUS (BANKS EX PURSH) GREENE	NI	FLEABANE, WANDERING
ERYTHRONIUM GRANDIFLORUM PURSH	FACU	FAWNLILY, LAMBS-TONGUE
ETHAMIA OCCIDENTALIS NUTT.	FACW*	FRAGRANT-GOLDEN-ROD, WESTERN
FESTUCA ALTAICA TRIN.	FACU*	FESCUE, ROUGH
FESTUCA ARUNDINACEA SCHREB.	FAC-	FESCUE, KENTUCKY
FESTUCA IDAHOENSIS ELMER	FACU*	FESCUE, BLUEBUNCH
FESTUCA OVINA L.	FACU*	FESCUE, SHEEP
FESTUCA RUBRA L.	FAC+	FESCUE, RED
FESTUCA SUBULATA TRIN.	FACU+	FESCUE, BEARDED
LOERKEA PROSERPINACOIDES WILLD.	FACW*	MERMAID-WEED, FALSE
FRAGARIA VIRGINIANA DUCHESNE	FACU*	STRAWBERRY, VIRGINIA
HELEOPSIS TETRAHIT L.	NI	HEMP-NETTLE, BRITTLE-STEM
HEALTHIERIA SHALLON PURSH	FACU*	SALAL

SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
GENTIANA AFFINIS GRISEB.	FACU+	GENTIAN, PRAIRIE
GERANIUM RICHARDSONII FISCH. & TRAUTV.	FAC-	CRANE'S-BILL, RICHARDSON'S
GEUM MACROPHYLLUM WILLD.	FACW*	AVENS, LARGE-LEAF
GYMNOCARPIUM DRYOPTERIS (L.) E. NEWMAN	FAC*	FERN, OAK
LAPLOPAPPUS RACEMOSUS (NUTT.) TORR.	FAC*	GOLDEN-WEED, CLUSTER
LAPLOPAPPUS UNIFLORUS (HOOK.) TORR. & GRAY	FACW-	GOLDEN-WEED, PLANTAIN
HEMICARPHA MICRANTHA (VAHL) PAX	OBL	DWARF-BULLRUSH
IERACLEUM LANATUM MICHX.	FAC+	COW-PARSHIP
IEROCHLOE OORATA (L.) BEAUV.	FACW+	GRASS, HOLY
HOLCUS MOLLIS L.	FACU*	GRASS, CREEPING VELVET
HORDEUM BRACHYANTHERUM NEVSKII	FACW*	BARLEY, MEADOW
HORDEUM DEPRESSUM (SCRIBN. & J.G. SMITH) RYDB.	FACW*	BARLEY, DWARF
HORDEUM HYSTRIX ROTH.	FACU+	BARLEY, MEDITERRANEAN
HORDEUM JUBATUM L.	FAC	BARLEY, FOX-TAIL
HORDEUM PUSILLUM NUTT.	FACU*	BARLEY, LITTLE
HYPERICUM FORMOSUM H.B.K.	FAC-	ST. JOHN'S-WORT, WESTERN
HYPERICUM MAJUS (GRAY) BRITTON	FACW-	ST. JOHN'S-WORT, LARGE CANADIAN
HYPOCHAERIS RADICATA L.	FACU*	CAT'S-EAR, SPOTTED
IMPATIENS GLANDULIFERA ROYLE	FACW*	POLICEMAN'S-HELMET
JUNCUS BALTICUS WILLD.	FACW+	RUSH, BALTIC
JUNCUS BUFONIUS L.	FACW	RUSH, TOAD
JUNCUS EFFUSUS L.	FACW	RUSH, SOFT
JUNCUS LESUEURII BOLAND.	FACW	RUSH, SALT
JUNCUS TENUIS WILLD.	FACW-	RUSH, SLENDER
LACTUCA BIENNIS (MOENCH) FERNALD	FAC	LETTUCE, BIENNIAL
LACTUCA PULCHELLA (PURSH) DC.	FAC-	LETTUCE, CHICORY
LACTUCA SERRIOLA L.	FACU	LETTUCE, PRICKLY
LEONTOOON AUTUMNALIS L.	FAC*	FLOWER, AUGUST
LIGUSTICUM CANADENSE (L.) BRITTON	NO	LOVAGE, NONDO
LISTERA CAURINA PIPER	FACU	THWAYBLADE, WESTERN
LISTERA CORDATA (L.) R. BR.	FACU*	THWAYBLADE, HEART-LEAF
LYODIA SEROTINA (L.) SALISB. EX REICHENB.	FACU	LILY, COMMON ALPINE
LOWICERA INVOLUCRATA BANKS EX SPRENG.	FAC+*	HONEYSUCKLE, FOUR-LINE
LOWICERA UTAHENSIS S. WATS.	FAC	HONEYSUCKLE, UTAH
LUPINUS RIVULARIS DOUGL. EX LINDL.	FACU	LUPINE, RIVERBANK
LUZULA COMOSA E. MEYER	FAC*	WOCORUSH, HAIRY
LECOPODIUM DENDROIDEUM MICHX.	FACU*	CLUBMOSS, TREE-LIKE
LECOPODIUM OBSCURUM L.	FACU	CLUBMOSS, TREE
LYSIMACHIA PUNCTATA L.	OBL*	LOOSESTRIFE, SPOTTED
LYTHRUM PORTULA (L.) D.A. WEBB	NI	LOOSESTRIFE, SPATULA-LEAF
LYTHRUM SALICARIA L.	FACW+	LOOSESTRIFE, PURPLE
MADIA GLOMERATA HOOK.	FACU+	TARWEED, MOUNTAIN
MAIANTHEMUM DILATATUM (A. WOOD) A. NELS. & J.F. MACBR.	FAC	LILY-OF-THE-VALLEY, FALSE
MALVUS FUSCA (RAF.) C.K. SCHNEID.	FACW	CRABAPPLE, PACIFIC
MENTHA ARVENSIS L.	FACW-	MINT, FIELD
MEPTENSIA PANICULATA (AIT.) G. DON	FACW-	BLUEBELLS, TALL
MELUS SUKSDORFII GRAY	FACU	MONKEY-FLOWER, SUKSDORF'S
MERBILIS NYCTAGINEA (MICHX.) MACMIL.	FACU*	FOUR-O'CLOCK, HEART-LEAF
MITELLA BREWERI GRAY	FAC*	BISHOP'S-CAP, FEATHERY
MITELLA PENTANDRA HOOK.	FAC*	BISHOP'S-CAP, FIVE-POINT
MORUS ALBA L.	FACU*	MULBERRY, WHITE

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SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
UHLENBERGIA ANDINA (NUTT.) A. HITCHC.	FAC	MUHLY, FOXTAIL
UHLENBERGIA FILIFORMIS (THURB. EX S. WATS.) RYDB.	FACW-	MUHLY, PULLUP
MUHLENBERGIA GLOMERATA (WILLD.) TRIN.	FACW+	MUHLY, MARSH
UHLENBERGIA MINUTISSIMA (STEUD.) SWALLEN	FAC+	MUHLY, LEAST
UHLENBERGIA RACEMOSA (MICHX.) B.S.P.	FACW	MUHLY, GREEN
MUHLENBERGIA RICHARDSONIS (TRIN.) RYDB.	FAC+	MUHLY, MAT
HEMLERIA CERASIFORMIS (HOOK. & ARN.) LONDON	FACU	OSO-BERRY
PLOPANAX HORRIDUS (J.E. SMITH) TORR. & GRAY EX MIQ.	FAC+	DEVIL'S-CLUB
OXALIS TRILLIIFOLIA HOOK.	FAC+	WOODSORREL, TRILLIUM-LEAF
PANICUM CAPILLARE L.	FACU+	WITCHGRASS
PANICUM VIRGATUM L.	FACW	SWITCHGRASS
EDICULARIS CONTORTA BENTH. EX HOOK.	FACU	LOUSEWORT, COILED
PENSTEMON ATTENUATUS DOUGL. EX LINDL.	FACU*	BEARDTONGUE, SULFUR
PENSTEMON SERRULATUS MENZIES	FACU*	BEARDTONGUE, CASCADE
ERIDERIDIA GAIRDNERI (HOOK. & ARN.) MATHIAS	FAC*	YAMPAH, GAIRDNER'S
PETASITES FRIGIDUS (L.) FR.	FACW-	COLTSFOOT, ARCTIC SWEET
PHIPPSIA ALGIDA (PHIPPS) R. BR.	OBL	GRASS, ICE
PHELEUM ALPINUM L.	FACW	TIMOTHY, ALPINE
PHELEUM PRATENSE L.	FAC-	TIMOTHY
PHLOX IDAHONSIS WHERRY	FACW*	PHLOX, CLEARWATER
PHLOX KELSEYI BRITTON	FACW*	PHLOX, KELSEY'S
PHYLLOOCE EMPETRIFORMIS (J.E. SMITH) D. DON	FACU*	MOUNTAIN-HEATH, PINK
PHYLLOOCE GLANDULIFLORA (HOOK.) COVILLE	FACU**	MOUNTAIN-HEATH, YELLOW
PHYSOCARPUS CAPITATUS (PURSH) KUNTZE	FACW-	NINEBARK, PACIFIC
PICEA GLAUCA (MOENCH) VOSS	FAC*	SPRUCE, WHITE
PINUS CONTORTA DOUGL. EX LOUDON	FAC	PINE, LODGE-POLE
PIPHERIA UNALASCENSIS (SPRENG.) RYDB.	NI	REINORCHID, ALASKA
PLANTAGO LANCEOLATA L.	FAC	PLANTAIN, ENGLISH
PLANTAGO MAJOR L.	FACU+	PLANTAIN, COMMON
PLATANThERA ORBICULATA (PURSH) LINDL.	NI	ORCHID, LARGE ROUND-LEAF
PLATANThERA STRICTA LINDL.	FACW+	BOGORCHID, SLENDER
PLECTRITIS MACROCERA TORR. & GRAY	FACU+	PLECTRITIS, LONGHORN
POA ANNUA L.	FAC	BLUEGRASS, ANNUAL
POA ARCTICA R. BR.	FACU*	BLUEGRASS, ARCTIC
POA COMPRESSA L.	FACU+	BLUEGRASS, CANADA
POA CURTA RYDB.	FACU	BLUEGRASS, WASATCH
POA NEVADENSIS VASEY EX SCRIBN.	FAC*	BLUEGRASS, NEVADA
POA PRATENSIS L.	FAC	BLUEGRASS, KENTUCKY
POA TRIVIALIS L.	FACW	BLUEGRASS, ROUGH
PODAGROSTIS HUMILIS (VASEY) BJOERKM.	FACW	BENTGRASS, MOUNTAIN
POLYGONUM BISTORTOIDES PURSH	FACW*	BISTORT, AMERICAN
POLYGONUM CUSPIDATUM SIEBOLD & ZUCCAR.	FACU*	KNOTWEED, JAPANESE
POLYGONUM LAPATHIFOLIUM L.	FACW	WILLOW-WEED
POLYGONUM SACHALINENSE F. SCHMIDT EX. MAXIM.	FACU*	KNOTWEED, GIANT
POLYPOGON MONSPELIENSIS (L.) DESF.	FACW	GRASS, ANNUAL RABBIT-FOOT
POLYSTICHUM MUNITUM (KAULF.) K. PRESL	FACU	FERN, PINELAND SWORD
PULMONARIA ALAACLINA A. CHOLEWA & D. HENDERSON	OBL*	PRIMROSE, ALKALI
PUNUS EMARGINATA (DOUGL. EX HOOK.) WALPERS	FACU*	CHERRY, BITTER
PSEUDOTSUGA MENZIESII (MIRBEL) FRANCO	FACU*	FIR, DOUGLAS
PSILOCARPHUS OREGONENSIS NUTT.	OBL	WOOLLY-HEADS, OREGON
PSILOCARPHUS TENELLUS NUTT.	OBL	WOOLLY-HEADS, SLENDER

SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
PUCCINELLIA CUSICKII WEATHERBY	NI	GRASS, CUSICK ALKALI
PUCCINELLIA DISTANS (L.) PARLAT.	FACW+	GRASS, WEeping ALKALI
PUCCINELLIA NUTTALLIANA (J.A. SCHULTES) A. HITCHC.	FACW+	GRASS, NUTTALL'S ALKALI
RANUNCULUS ESCHSCHOLTZII SCHLECHT.	FACW*	BUTTER-CUP, ESCHSCHOLTZ
RANUNCULUS GLABERRIMUS HOOK.	FACU	BUTTER-CUP, SAGEBRUSH
RANUNCULUS OCCIDENTALIS NUTT.	FAC	BUTTER-CUP, WESTERN
RANUNCULUS UNCINATUS D. DON EX G. DON	FAC-	BUTTER-CUP, HOOKED
RANUNCULUS VERECUNDUS B. ROB.	FAC*	BUTTER-CUP, WETSLOPE
RAPHANUS SATIVUS L.	NI	RADISH
RHAMNUS PURSHIANA DC.	FAC-	BUCKTHORN, CASCARA
RHINANTHUS CRISTA-GALLI L.	FACU	YELLOW-RATTLE, LITTLE
RHOODENDRON ALBIFLORUM HOOK.	FACU	RHOODENDRON, WHITE-FLOWER
RIBES CEREUM DOUGL.	FAC*	CURRANT, WHITE SQUAW
RIBES DIVARICATUM DOUGL.	FAC*	GOOSEBERRY, SPREADING
RIBES HUDSONIANUM RICHARDS.	FACW	CURRANT, HUDSON BAY
RIBES SETOSUM LINDL.	FACW*	GOOSEBERRY, BRISTLY
RIBES VISCOSISSIMUM PURSH	FAC	CURRANT, STICKY
RIBES WOLFII ROTH.	FAC*	CURRANT, WOLF
ROBINIA PSEUDOACACIA L.	FACU	LOCUST, BLACK
RORIPPA CURVISILIQUA (HOOK.) BESSEY EX BRITTON	OBL	YELLOW-CRESS, CURVE-POD
ROSA EGLANTERIA L.	FACW*	SWEETBRIER
ROSA GYMNOCARPA NUTT.	FACU	ROSE, WOOD
ROSA NUTKANA K. PRESL	FAC	ROSE, NOOTKA
ROSA PISOCARPA GRAY	FAC	ROSE, CLUSTERED
RUBUS BARTONIANUS M.E. PECK	FACW*	RASPBERRY, BARTON'S
RUBUS DISCOLOR WEIHE & NEES	FACU	BLACKBERRY, HIMALAYAN
RUBUS PARVIFLORUS NUTT.	FAC-	THIMBLE-BERRY, WESTERN
RUBUS PROCERUS P.J. MUELL.	FACU	BLACKBERRY, HIMALAYA
RUBUS SPECTABILIS PURSH	FAC+	BERRY, SALMON
RUBUS STRIGOSUS MICHX.	FAC-	RASPBERRY, RED
RUBUS URSINUS CHAM. & SCHLECHT.	FACU	DEWBERRY, CALIFORNIA
RUMEX ACETOSELLA L.	FACU+	SORREL, SHEEP
RUMEX CRISPUS L.	FAC+	DOCK, CURLY
SALIX ARCTICA PALLAS	FAC	WILLOW, ARCTIC
SALIX MACCALLIANA ROWLEE	FACW*	WILLOW, MCCALL'S
SALIX MELANOPSIS NUTT.	OBL*	WILLOW, DUSKY
SALIX RETICULATA L.	FAC*	WILLOW, NET-LEAF
SALIX WOLFII BEBB	OBL	WILLOW, WOLF
SALSOLA KALI L.	UPL	THISTLE, RUSSIAN
SAMBUCUS CERULEA RAF.	FACU	ELDER, BLUE
SAXIFRAGA ADSCENDENS L.	FACW*	SAXIFRAGE, ROCK
SAXIFRAGA INTEGRIFOLIA HOOK.	NI	SAXIFRAGE, COLUMBIA
SCIRPUS CYPERINUS (L.) KUNTH	OBL	WOOL-GRASS
SEDUM ROSEA (L.) SCOP.	NI	STONECROP, ROSEROOT
SENECIO CYMBALARIOIDES H. BUEK	FACW	GROUNDSEL, CLEFT-LEAF
SENECIO INTEGERRIMUS NUTT.	FACU	GROUNDSEL, LAMBSTONGUE
SENECIO JACOBAEA L.	FACU*	STINKING-WILLIE
SENECIO SERRA HOOK.	FACU*	GROUNDSEL, BUTTERWEED
SETARIA VERTICILLATA (L.) BEAUV.	FACU-	GRASS, BUR BRISTLE
SIDALCEA NELSONIANA PIPER	FAC	CHECKER-MALLOW, NELSON'S
SISYRINCHIUM LITTORALE GREENE	FACW*	BLUE-EYE-GRASS, ALASKA

SPECIES WITH A CHANGE IN INDICATOR STATUS OR ADDED TO NORTHWEST 1988 LIST

SCIENTIFIC NAME	INDICATOR	COMMON NAME
ANUM DULCAMARA L.	FAC+	NIGHTSHADE, CLIMBING
SCOPULINA GREENE	FACU	MOUNTAIN-ASH, GREENE'S
PIRAEA BETULIFOLIA PALLAS	FAC*	MEADOW-SWEET, WHITE
FRANTHES ROMANZOFFIANA CHAM.	FACW	LADIES'-TRESSES, HOODED
ROBOLUS AIROIDES (TORR.) TORR.	FAC*	SACATON, ALKALI
POROBOLUS CRYPTANDRUS (TORR.) GRAY	FACU-	DROPSEED, SAND
POROBOLUS HETEROLEPIS (GRAY) GRAY	FACU*	DROPSEED, PRAIRIE
ELLARIA LAETA RICHARDS.	UPL	STARWORT, LONG-STALK
ELLARIA MEDIA (L.) VILLARS	FACU	CHICKWEED, COMMON
ELLARIA UMBELLATA TURCZ. EX KAREL. & KIR.	FACW*	STARWORT, UMBELLATE
ANTHIUM OCCIDENTALE GRAY	FAC*	FEATHER-BELLS, WESTERN
PHORICARPOS OCCIDENTALIS HOOK.	NI	SNOWBERRY, WESTERN
ANACETUM VULGARE L.	NI	TANSY, COMMON
TAUSCHIA TENUISSIMA (GEYER EX HOOK.) MATHIAS & CONSTANCE	FACW*	TAUSCHIA, LEIBERG'S
TAUSCHIA BREVIFOLIA NUTT.	NI	YEW, PACIFIC
THALICTRUM OCCIDENTALE GRAY	FACU*	MEADOW-RUE, WESTERN
HELYPTERIS NEVADENSIS (BAKER) CLUTE EX MORTON	NI	FERN, SIERRA NEVADA MARSH
HEMIPHYLLIS MENZIESII (PURSH) TORR. & GRAY	FAC*	PLANT, PIGGY-BACK
HEMIPHYLLIS BOREALIS RAF.	FACW*	STARFLOWER, AMERICAN
TRIFOLIUM HAYDENII PORTER	UPL	CLOVER, HAYDEN
TRIFOLIUM HYBRIDUM L.	FAC	CLOVER, ALSIKE
TRIFOLIUM REPENS L.	FAC*	CLOVER, WHITE
TRILLIUM OVATUM PURSH	FACU*	TRILLIUM, WESTERN
TRITICUM SPICATUM (L.) RICHTER	UPL	FALSE-OATS, SPIKED
TRITICUM WOLFII VASEY	FACU	FALSE-OATS, WOLF'S
VACCINIUM CESPITOSUM MICHX.	FAC*	BLUEBERRY, DWARF
VILLODEA ATROPURPUREA (WAHLENB.) FR.	FACW	HAIRGRASS, MOUNTAIN
VILLODEA VIRIDE AIT.	FACW	FALSE-HELLEBORE, AMERICAN
VERBENA BRACTEATA LAG. & RODRIG.	FAC*	VERVAIN, PROSTRATE
VERONICA ARVENSIS L.	FACU*	SPEEDWELL, CORN
VERONICA CUSICKII GRAY	FAC*	SPEEDWELL, CUSICK'S
VERONICA WORMSKJOLDII ROEM. & J.A. SCHULTES	FAC*	SPEEDWELL, AMERICAN ALPINE
VIBURNUM TRILOBUM MARSHALL	FACW-	CRANBERRYBUSH, AMERICAN
VICIA AMERICANA MUHL. EX WILLD.	FAC*	VETCH, AMERICAN PURPLE
VICIA BROMOIDES (L.) S.F. GRAY	NI	GRASS, BROME SIX-WEEKS
ZIGADENUS ELEGANS PURSH	FACU	DEATHCANAS, MOUNTAIN
ZIGADENUS VENENOSUS S. WATS.	FACU*	DEATHCANAS, MEADOW

Attachment G

**REVISION OF THE NATIONAL LIST OF PLANT SPECIES THAT OCCUR IN  
WETLANDS**

February 15, 1997

# Revision of The National List of Plant Species That Occur in Wetlands\*

by

Porter B. Reed, Jr.  
Compiler

In cooperation with the National and Regional Interagency Review Panels:

U.S. Fish and Wildlife Service  
U.S. Army Corps of Engineers  
U.S. Environmental Protection Agency  
Natural Resources Conservation Service

Department of the Interior  
U.S. Fish and Wildlife Service  
Washington, DC 20240

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\* Federal Register Notice Page 2680-2681.  
January 17, 1997 (Volume 62, Number 12).  
Notice of availability and request for comments.

AR 002746

## 1996 National List of Vascular Plant Species That Occur in Wetlands

The Fish and Wildlife Service has prepared a National List of Vascular Plant Species That Occur in Wetlands: 1996 National Summary (1996 National List). The 1996 National List is a draft revision of the National List of Plant Species That Occur in Wetlands: 1988 National Summary (Reed 1988) (1988 National List). The 1996 National List is provided to encourage additional public review and comments on the draft regional wetland indicator assignments.

The 1996 National List reflects a significant amount of new information that has become available since 1988 on the wetland affinity of vascular plants. This new information has resulted from the extensive use of the 1988 National List in the field by individuals involved in wetland and other resource inventories, wetland identification and delineation, and wetland research. Interim Regional Interagency Review Panel (Regional Panel) changes in indicator status as well as additions and deletions to the 1988 National List were documented in Regional supplements.

The National List was originally developed as an appendix to the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) to aid in the consistent application of this classification system for wetlands in the field. The 1996 National List also was developed to aid in determining the presence of hydrophytic vegetation in the Clean Water Act Section 404 wetland regulatory program and in the implementation of the swampbuster provisions of the Food Security Act. While not required by law or regulation, the Fish and Wildlife Service is making the 1996 National List available for review and comment.

Copies of the 1996 National List are available from the Fish and Wildlife Service, National Wetlands Inventory, Suite 101, Monroe Building, 9720 Executive Center Drive, St. Petersburg, FL 33702-2440. An electronic copy of the 1996 National List is available for downloading from the World Wide Web at <http://www.nwi.fws.gov/ecology.htm>. Written comments may be submitted to the Fish and Wildlife Service, National Wetlands Inventory, Suite 101, Monroe Building, 9720 Executive Center Drive, St. Petersburg, FL 33702-2440, faxed to (813) 570-5409, or electronically transmitted to [ecology@wetlands.nwi.fws.gov](mailto:ecology@wetlands.nwi.fws.gov). The principal agency contacts for the cooperating agencies are Mr. Porter B. Reed, Jr., Fish and Wildlife Service, at (813) 570-5425, Dr. Russell Theriot, U.S. Army Corps of Engineers, at (601) 634-2733, Mr. William Sipple, Environmental Protection Agency, at (202) 260-6066, and Dr. Norman Melvin, Natural Resources Conservation Service, at (301) 497-5933.

The 1996 National List was produced under the guidance of National and Regional Panels composed of representatives from the Fish and Wildlife Service, U.S. Army Corps of Engineers, Environmental Protection Agency, and the Natural Resources Conservation Service. The National Panel provides guidance and direction for the development and maintenance of the National List of Vascular Plant Species That Occur in Wetlands. The wetland ecologist of the National Wetlands Inventory, Fish and Wildlife Service, coordinates the activities of the National



Panel. The National Panel meets as necessary to review Regional Panel progress and to set future direction and goals.

The Regional Panels solicit and obtain information from their agency personnel, regional reviewers, and from published literature to aid in the assignment of regional wetland indicators. The activities of the Regional Panels are coordinated by a Fish and Wildlife Service representative, usually the Regional Wetland Inventory Coordinator. The Regional Panels also meet as necessary to consider and assess all new submissions recommending changes to the National List of Vascular Plant Species That Occur in Wetlands that relate to their respective Regions.

The cooperating agencies responsible for the development and continued enhancement of the 1996 National List have recently signed an Agreement for Coordination in the Refinement of the National List of Vascular Plant Species That Occur in Wetlands. The 1996 National List represents the combination of the Regional Lists into a single list. National and Regional Lists will be released as Fish and Wildlife Service publications and will be made available to the other agencies and the public.

Regional Lists will be advertised separately in the Federal Register in the future as changes are made by individual Regional Panels. The production of new National Lists will not occur any more often than every 5 years. If changes to the Regional Lists become necessary outside the 5-year cycle, those changes will be made in compliance with these procedures.

To facilitate the development of the new National List of Vascular Plant Species That Occur in Wetlands, the four principal agencies involved in its preparation agree to work cooperatively at achieving their collective goal by adhering to the following steps:

1. The Regional Panels prepare an updated draft of the Regional List of Vascular Plant Species That Occur in Wetlands.
2. The Regional Panels submit proposed changes to the Regional List to the National Panel and identify those changes to taxa in the updated draft that have potentially significant impact for wetland identification and/or delineation in the region.
3. The National Panel reviews proposed changes in close consultation with the Regional Panels. This review includes all technical input and rationale that formed the basis for proposed changes to each Regional List.
4. The National Panel makes additions/deletions/corrections as needed based on their review, and in consultation with the Regional Panels. As part of National Panel's work, agency representatives to the Panel inform the appropriate Headquarters officials in their respective agencies, of the status of the effort during all phases of the process. This will include a briefing by the National Panel.

5. The Service prepares a draft National List and prepares a Notice of Availability in Federal Register (FR) for public review and comment.
6. Public comments come back to the Service. The National Panel will evaluate the comments to determine which merit scientific review and input.
7. Comments meriting scientific review are submitted to the Regional Panels, which will prepare draft responses and clarify any discrepancies.
8. The National Panel, in close consultation with the Regional Panels, reviews the comments and the Regional Panel responses, resolves differences, and prepares responses, including modifications of the proposed changes, if needed.
9. The Ecology Section of the National Wetlands Inventory Center summarizes all responses at each stage of the process and presents the final National List to the National Panel. The National Panel members will inform the appropriate Headquarters officials in their respective agencies of the status and effects of the effort.
10. When the National Panel completes its work on the National List, final technical determinations, and the effects of those determinations are provided to each agency Headquarters by their respective National Panel members.
11. The Service, as chair of the National Panel, summarizes all National and Regional Panel responses and prepares a Notice of Availability in the FR for the final revised National List.

The 1996 National List consolidates all Regional Interagency Review Panel wetland indicator decisions made since 1988. The revision process followed the same procedures described for the development of the 1988 National List. Review submitted for each species was examined by each Regional Panel. A unanimous decision by each Regional Panel on the indicator status for each species was derived by comparing the new review against the previous review and habitat provided by botanical manuals and floras. In some regions, habitat expressed by botanical floras published since the completion of the 1988 National List was extensively used by the Regional Panels in the development of the 1996 National List.

The 1996 National List has been revised to conform to A Synonymized Checklist of the Vascular Flora of the United States, Canada, and Greenland (Kartesz 1994) (1994 Synonymized Checklist). The 1994 Synonymized Checklist replaces the National List of Scientific Plant Names (SCS 1982) (NLSPN) followed by the 1988 National List. The 1994 Synonymized Checklist has been adopted by a number of federal natural resource agencies and is rapidly becoming the federal standard for vascular plant nomenclature. The Natural Resources Conservation Service maintains the 1994 Synonymized Checklist as the PLANTS database. The PLANTS database is accessible electronically at <http://trident.ftc.nrcs.usda.gov/plants/>. The PLANTS database maintains the most current revision of the 1994 Synonymized Checklist and

state distribution data. Future revisions of the 1996 National List will follow the most current version of the PLANTS database.

The conversion of the nomenclature to follow the 1994 Synonymized Checklist has resulted in a number of changes within the 1996 National List.

1. A few taxa listed in the 1988 National List were designated in the 1994 Synonymized Checklist as excluded or anomalous names and thus were eliminated from the 1996 National List.
2. A small number of taxa with misapplied or misspelled names were converted manually to the correct name.
3. A number of infra-taxa (subspecies, varieties, and quadrimorphs) occur on the 1996 National List as a result of the merger of many formerly accepted taxa into other accepted taxa with a different regional wetland indicator. The wetland indicator assigned to the binomial name for a taxon applies to all infra-taxa unless an indicator is specifically given for one or more infra-taxa.
4. Where two formerly accepted taxa with different indicators were merged into a single taxon with no accepted infra-taxa, the Regional Interagency Review Panels have considered all previous review data for the two or more taxa and developed a single indicator.

The regional distribution of many taxa in the 1996 National List have been modified to reflect revised 1994 state distribution data graciously provided by Dr. John T. Kartesz. A small number of taxa not listed in the 1994 Synonymized Checklist are included in the 1996 National List. These taxa include names inadvertently omitted, unpublished when the 1994 Synonymized Checklist was completed, or occur in the western Pacific outside the coverage of the 1994 Synonymized Checklist. Taxa that have had an Obligate Upland indicator applied across all regions have been removed from the 1996 National List.

The 1996 National List presents for all taxa alphabetically by scientific name the wetland indicator for each region and subregion and the national indicator range. The national indicator range represents the span of indicator assignments from the lowest to the highest frequency of occurrence in wetlands. If a species does not occur in wetlands with an estimated probability equal to or greater than one percent in any Region, it is not on the 1996 National List.

The wetland indicator represents the estimated probability (likelihood) of a species occurring in wetlands versus non-wetlands in the region. The probability percentages applied to each indicator category were provided to enhance an understanding of this methodology. The regional indicator assignments are not based on the results of a statistical analysis of the occurrence of these species in wetlands. The indicator assignments are the best approximation of wetland affinity for these species based upon a synthesis of submitted review comments, published botanical manuals and literature, and field experience. If a Regional Panel was not able to reach a unanimous decision on

a species, NA (no agreement) was recorded. An NI (no indicator) was recorded for those species for which insufficient information was available to determine an indicator status or that were not considered by the Regional Panel. An asterisk (\*) following a regional indicator identifies tentative assignments based on limited information or conflicting review. A positive (+) or negative (-) sign was used with the Facultative indicator categories to more specifically define the regional frequency of occurrence in wetlands. The positive sign indicates a frequency toward the higher end of the category (more frequently found in wetlands). A negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands).

### ***Indicator Categories***

- Obligate Wetland (OBL). Occur almost always (estimated probability >99%) under natural conditions in wetlands.
- Facultative Wetland (FACW). Usually occur in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
- Facultative (FAC). Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
- Facultative Upland (FACU). Usually occur in non-wetlands (estimated probability 67%-99%), but occasionally found in wetlands (estimated probability 1%-33%).
- Obligate Upland (UPL). Occur in wetlands in another region, but occur almost always (estimated probability >99%) under natural conditions in non-wetlands in the region specified.

The wetland indicator categories should not be equated to degrees of wetness. Many Obligate Wetland species occur in permanently or semipermanently flooded wetlands, but a number also occur and some are restricted to wetlands that are only temporarily or seasonally flooded. The Facultative Upland species include a diverse collection of plants that range from weedy species adapted to a number of environmentally stressful or disturbed sites (including wetlands) to species in which a portion of the gene pool (an ecotype) always occur in wetlands. Both the weedy and ecotype representatives of the facultative upland category occur in a variety of wetland habitats, ranging from the driest wetlands to semipermanently flooded wetlands.

The actual frequency of occurrence of a specific species in wetlands may be anywhere within the frequency range of the indicator category. For example, some species assigned to the Facultative Upland indicator category may actually have a frequency toward the lower end of the category whereas other species may actually have a frequency toward the upper end of the category.

The regions, as defined in the 1988 National List, have been maintained to provide broad geographic divisions for the Regional Panels. The states comprising the regions expressed by the regional codes used in the NLSPN are displayed below.

REGION CODE	REGION	STATE(S) IN REGION
1	Northeast	CT,DE,KY,MA,MD,ME,NH,NJ,NY,OH,PA,RI,VA,VT,WV
2	Southeast	AL,AR,FL,GA,LA,MS,NC,SC,TN
3	North Central	IA,IL,IN,MI,MO,MN,WI
4	North Plains	ND,MT (Eastern),SD,WY (Eastern)
5	Central Plains	CO (Eastern),KS,NE
6	South Plains	OK,TX
7	Southwest	AZ,NM
8	Intermountain	CO (Western),NV,UT
9	Northwest	ID,MT (Western),OR,WA,WY (Western)
0	California	CA
A	Alaska	AK
C	Caribbean	PR (Puerto Rico), VI (U.S. Virgin Islands)
H	Hawaii	HI (Hawaiian Islands), AS (American Samoa), FM (Federated States of Micronesia), GU (Guam), MH (Marshall Islands), MP (Northern Mariana Islands), PW (Palau), UM (U.S. Minor Outlying Islands)

The 1996 National List contains subregional indicator assignments that provide a means for the Regional Panels to describe more accurately the ecological variability of a species within a region. The subregions, described as Land Resource Regions and Major Land Resource Areas of the United States, are ecologically defined by the Soil Conservation Service (1981) as geographic areas with similar soils, climate, water resources, and land use. Subregional wetland indicator assignments have been applied to only a few species by a limited number of Regional Panels. We anticipate that the number of subregional indicator assignments will increase substantially as the 1996 National List is further refined.

A composite list of all synonym names for all accepted taxa included on the 1996 National List from the 1994 Synonymized Checklist (graciously provided by Dr. John T. Kartesz) and the NLSPN is presented alphabetically by scientific name for all synonyms. The previous acceptance in the 1988 National List of a current synonym is indicated by an (\*) preceding the synonym name. The accepted name from the 1994 Synonymized Checklist is displayed for each synonym name. The source of each synonym name is presented.

The 1996 National List will remain dynamic and the submission of well documented review based on field experience is encouraged. We are primarily seeking review of the information contained in the 1996 National List. However, comments on other taxa not included on the 1996 National List and recommendations for indicator assignments for other subregions are welcome. Comments that concur with an assigned indicator are as important as reviews supporting a different indicator. We especially would appreciate receiving review comments on taxa currently

assigned an "NI" (no indicator) in one or more regions. No previous regional review has been submitted for these taxa and/or there is limited habitat information in the botanical literature.

All scientific plant names in a submission except for those taxa occurring in the Western Pacific must be contained in the 1994 Synonymized Checklist or the PLANTS database. Complete documentation, including a description and explanation of the variety of field sites and/or data supporting the recommended wetland indicator, is necessary for the Regional Panels to adequately understand and consider a submission. A submission should contain a strong rationale supporting the proposed recommendation including the extent of the area that the field experience and data provided are based upon. Information presented in the submission from botanical and ecological texts and periodicals should be supplied with the citation of the source. The rationale should clearly discuss as part of the field information the percentage of occurrence of the taxon in both wetland and non-wetland areas. The Regional Panels will consider submissions ranging from short narratives to those containing detailed vegetation sampling data analyses. An ideally complete submission should present for each field site referenced in the submission quantitative community information including the scientific names and importance of all plant taxa, soils data including classification and morphology (especially the presence of field indicators) (USDA NRCS 1996), hydrologic data (especially any intensive water table and redox potential monitoring), and landscape position.

A review form is provided with the 1996 National List on the Ecology Section World Wide Web site to facilitate review submission. Use of this review form is encouraged but not required. Completed submissions and review forms can be delivered by the World Wide Web to [ecology@wetlands.nwi.fws.gov](mailto:ecology@wetlands.nwi.fws.gov)

### ***Literature Cited***

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish & Wildlife Service. FWS/OBS-79/31. 103pp.

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**AR 002754**

EXHIBIT

AR 002755



FOSTER PEPPER & SHEFELMAN PLLC

ATTORNEYS AT LAW



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336  
2:10  
HELSELL FETTERMAN LLP <sup>RD</sup> Direct Phone  
(206) 447-4676

Direct Facsimile  
(206) 749-1997

E-Mail  
PearR@foster.com

November 15, 2001

VIA FACSIMILE

Ms. Kaleen Cottingham, Presiding Officer  
Pollution Control Hearings Board  
Rowe Six, Bldg. 2, MS 40903  
4224 6th Avenue SE  
Lacey, WA 98504-0903

Re: PCHB Case No. 01-160  
Plans and Reports Prepared Pursuant to §401 Certification

1111 THIRD  
AVENUE  
Suite 3400  
SEATTLE  
Washington  
98101-3299

Dear Ms. Cottingham:

Telephone  
(206) 447-4400  
Facsimile  
(206) 447-9700  
Website  
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As required by the Board's Prehearing Order in this matter, the Port of Seattle herein identifies the plans and reports (other than ministerial documents) prepared or expected to be prepared pursuant to the §401 Certification and on which the Port or Ecology may rely at the hearing on the merits. The Port has consulted with Ecology on the list included below.

In addition, the Port has identified certain ministerial documents to be prepared pursuant to the §401 Certification. Any document deemed to be non-ministerial is hereby listed as a document to be prepared after February 15, 2001.

The §401 Certification requires the submittal of certain plans and reports, both before and after the November 15, 2001 date set by the Board. With respect to each report submitted, it is possible that Ecology may require changes. The Port reserves the right to submit as an exhibit any such changes required by Ecology. In addition, it is possible that the U.S. Army Corps of Engineers may require changes to some plans as part of the §404 permitting process. The Port reserves the right to submit as an exhibit any changes required by the COE.

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A. Plans and reports prepared and/or submitted on or before November 15, 2001.

- ✓ 1. Mitigation plan for the Wetland A17 complex. §401 ¶D.4.  
The Wetland A17 mitigation plan was submitted to Ecology on 9/8/01.
- ✓ 2. Best management practices to prevent interception of contaminated groundwater and plan to monitor potential contaminant transport via subsurface utility lines. §401 ¶F.1.  
These documents were submitted to Ecology on 9/10/01.

B. Plans and reports to be submitted between November 16, 2001 and February 1, 2001.

- ✓ 1. Revised Natural Resource Mitigation Plan (NRMP). §401 ¶D.1 *et seq.*  
The revised NRMP will include both the Auburn Site Mitigation Plan and the Borrow Site Three plans mentioned in the §401 Certification.  
Port will submit the Revised NRMP to Ecology on or about 11/21/01.
- ✓ 2. Surface Water and Ground Water Monitoring Plan, including monitoring plan regarding subsurface utility lines. §401 ¶E.3.  
The Port will submit this monitoring plan on or about 11/19/01.
3. Revised Low Streamflow Analysis and Low Flow Offset Proposal. §401 ¶L.1.  
The revised low streamflow analysis and mitigation plan will be submitted by the Port to Ecology on or about 12/17/01.
4. Stormwater Facilities Operation and Maintenance Plan. §401 ¶J.2.f.  
The operation and management plan is required to be submitted by 3/19/02.  
The Port can submit the plan on or before 2/1/02.
5. Construction Stormwater Pollution Prevention Plan (SWPPP) and Erosion and Sediment Control plans pursuant to existing NPDES permit. §401 ¶¶H.3 & K.1.  
These plans are developed on a project-by-project basis, and will be prepared in this fashion for the projects covered by the §401 Certification. The Port's construction SWPPP is implemented in each project's construction documents at the Port on a project-by-project basis. Those provisions are already in place pursuant to the existing NPDES.  
The Port reserves the right to submit sample SWPP and ESC plans prior to 2/1/01.

6. Spill Prevention and Containment Plan for all project elements. §401 ¶L.1.  
The Port has current spill prevention and containment plan provisions for all projects. Like the SWPPP, these provisions are implemented on a project-by-project basis and included in construction documents. Those same provisions will be utilized for all projects subject to the §401 Certification.  
The Port reserves the right to submit sample Spill Prevention and Containment plans prior to 2/1/01.

C. Ministerial documents that may be prepared and submitted pursuant to the §401 Certification.

1. A specific monitoring plan for each in-water or shoreline project. §401 ¶A.2.a.  
A plan for each separate project is required 30 days prior to start of each construction project. This plan would be required, of course, only if a §404 permit was issued by the Corps of Engineers.  
These plans are ministerial because the monitoring requirements are specified in §401 Certification and in the Natural Resources Mitigation Plan.
2. Monitoring reports are required for each project-specific monitoring plan. §401 ¶A.2.h.  
This monitoring would not occur unless a §404 permit was issued and work commenced. The monitoring reports would be ministerial and factual in nature, because the monitoring requirements are already being specified in the NRMP.
3. Hydrologic monitoring of downslope wetlands. §401 ¶D.1.g.  
This monitoring is ministerial and factual in nature, because the monitoring requirements are being specified in the NRMP.
4. Restrictive covenants for all wetland mitigation areas are required to be recorded within 60 days after issuance of a §404 permit from COE. §401 ¶¶D.2; D.4.h. & D.6.f. As-built plans for wetland mitigation sites are due 60 days after the completion of construction. §401  
These restrictive covenants would be ministerial because approved drafts for restrictive covenants are included in the NRMP.
5. Monitoring of wetland hydrology and wetland protection swales is required after construction of the in-stream improvements. §401 ¶¶ D.6.d & D.6.e.  
This monitoring is factual and ministerial in nature because the monitoring criteria are included in the NRMP.

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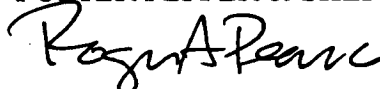
Ms. Kaleen Cottingham  
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6. Documentation of each fill source utilized for embankment fill, both within wetlands and on uplands, and monthly summaries of fill locations. §401 ¶¶E.1.a & E.2.  
These documents will be submitted to Ecology on an ongoing basis. The reports are ministerial because the criteria for fill acceptance are set forth in the §401 Certification.
7. Monitoring plan for stormwater and construction dewatering discharges at Auburn mitigation site. §401 ¶K.8.  
This monitoring plan is required 30 days prior to the beginning of construction at the Auburn mitigation site. This plan is ministerial in nature because the criteria for monitoring are already set forth in the NRMP.

Copies of all plans and reports will be submitted to the attorneys for petitioner ACC in conformity with the Board's Prehearing Order.

Very truly yours,

FOSTER PEPPER & SHEFELMAN PLLC



Roger A. Pearce  
Attorneys for Port of Seattle

cc: Counsel of record (via FAX)

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