Table 2 – 60% Sediment Acceptance Criteria Technical Memorandum Comments

Comment No.	Page No.	Section No.	Directed Comment (Yes/No)	Comment
1.		General		The following comments from the 30% Submittal appear not to have been addressed: 1e, 1f, 2, 5b, 6a, 6b, 7a, 7b, 8, 9, 16, 22a, 24, 25
2.		General		These comments on this document include comments also related to material in Appendix I of the Design Analysis Report (DAR). The reason is that the Appendix I modeling material seems to overlap into this report, and it is critical that the correct modeling, calculations and conclusions arrived at from those calculations be carefully developed and understood before repeating information in different reports. Appendix I to the 60% DAR needs to be revised based on comments to that report before the conclusions or values from that report can be imported into this document. Ultimately, all documents must be consistent, comments applied to Appendix I shall apply here as well.
3.		General		The discharge of contaminants from the different layers of sediment placed in the Confined Disposal Facility (CDF) must account for flows in a surface water body until the CDF is filled above the water line, and also must account for flow through the different layers of sediments once the CDF is filled above the river and ground water levels. As such, the flow of contaminants must account for all the potentially significant hydraulic conductivities and flow paths (exchanges from the finer material with lesser hydraulic conductivities to those surrounding materials with significantly higher hydraulic conductivities). The assumption that the flow of ground water contaminants will be along the centerline of the finer sediments may not present us with a reasonable estimate of either the contaminant flux or the time it would take contaminants from the head of the CDF to arrive at the berm. That would also affect any assumptions about potential degradation before reaching the river since those estimates depend on time of travel.
4.		General		The acceptance criteria will be very dependent on the different sediment types (and related parameters such as foc, contaminant concentrations and related tests (DRET or MET total and dissolved, etc.), and on the potential for those sediments to affect or alter the limited modeling conclusions from the Slip 3 sediments done so far. Particularly there should be much more sampling and testing for potential leaching for any of the contaminants not presently tested and modeled in the Slip 3 material (that would include anything besides copper and lead, which as of the 60% design are the only contaminants that have been modeled).
5.		General		The organization of the document could be improved. Section references are incorrect in several instances (see specific comments below). Section 6 seems out-of-place and could perhaps be included as a subsection in Section 3. The information in sections 3 and 4 should be rearranged to provide the reader a more logical flow from, for example, sediment quality criteria to the sampling and analytical requirements included in the SAP. At the very least, pertinent subsections of Section 4 should be referenced in Section 3.

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6.		General		Dioxin is not included in the list of sediment screening criteria. Dioxin is a chemical of concern upstream of T4 and at other locations within the Portland Harbor site. Please include chlorinated dioxins and furans in the list of screening chemicals.
7.	1	1.1		The RAO/performance standards as written impact not only the potential monitoring locations/compliance points but also the modeling that is done to design the CDF and to predict environmental impacts from it as well as the acceptability of wastes to be accepted.
8.	1	1.1		Last bullet, sentence beginning "To ensure…" Sentence is unclear regarding which criteria will be met by exiting and receiving water. (The text has been taken verbatim from the DAR thus this is also the case therein.) Please revise. A definition of "receiving water" in the text would be helpful.
9.	1	1.1		The CDF Performance Standard should be modified. It defines the CDF design such that "the quality of groundwater exiting the CDF to the river will meet USEPA's national recommended chronic water quality criteria or ambient background conditions at the point of discharge, and fish consumption criteria and drinking water criteria/guidelines in the receiving water." This statement assumes that the compliance point for the aquatic life WQC will be at the face of the berm and that the compliance point for the human health criteria (WQC for human health and MCLs/PRGs) will be within the water column 10 cm (WQC) or 10 meters (MCLs/tap water PRGs) from the berm. This allows for tremendous dilution, does not take into account any consideration of loading, and is not consistent with EPA's request to have compliance monitoring inside the berm. The final language should reflect the final compliance points chosen by EPA. The aquatic life WQC should not be limited to USEPA's but should include consideration of all of those criteria listed in the EPA/ODEQ JSCS, using the hierarchy given in the JSCS. Also, EPA's MCLs are not criteria or guidelines- they are regulations. See Table 1 attached to DAR Comments.
10.	1			Last bullet: "….will meet USEPA's national recommended chronic water quality criteria or ambient background conditions…". The "or" is confusing. Should this be "and"? Should this be "national recommended chronic water quality criteria or ambient background conditions, which ever are less (i.e., lower concentrations)"?
11.	2			Last sentence before Section 1.2. Please replace "next section" with "Section 2."
12.	3			Second paragraph: The Long-Term Monitoring and Reporting Plan (Appendix E) should be drafted or completed before the Final 100% Design Document. Currently no text is included in the appendix (E). The current figures in appendix E show no "sentinel" wells in the berms. Background wells and wells below the fill should also be shown.
13.	5			Paragraph 2: How will placed contaminated dredged materials below the water table "minimize the leachability and mobility of contaminants"? This may be true for some contaminants under some conditions; but not for all contaminants under all conditions.
14.	7	Section 3		Paragraph after bullets. Please correct section references.

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15.	8	Section 3.2.1		The text states “Testing requirements for TCLP organic constituents will be based on the results of the historical review and bulk sediment chemical analysis.” Please include specifically how the organic constituents will be chosen or provide a reference to the procedure.
16.	8	Section 3.2.1	Yes	Treatment methods that destroy or remove contaminants from sediments may be acceptable; however, treatment methods that immobilize contaminants are not acceptable. Please revise the text accordingly.
17.	8	Section 3.2.2		Sediments with concentrations above the criterion for “free oil” will not be accepted. The quantitative criterion used to determine “free oil” content is “greater than 1 percent TPH by weight (greater than 10,000 ppm, as the sum of gasoline, diesel, and residual oil fractions”. This criterion level is much too high as it could potentially result in wastes being accepted that have levels of BTEX (e.g., benzene, toluene, xylene) and soluble diesel components that are at 10,000 ppm individually or in sum. Such constituents can easily move through the berm with little control. In addition, such constituents can mobilize the contaminants that are adsorbed to particulates in the CDF and in the CDF berm. The potential impacts of these types of such constituents on contaminant mobility is never discussed in any of the modeling or monitoring in the DAR or in the acceptance criteria. Note also that Section 6.1 provides an exception for the need to meet the “free oil” criteria after treatment.
18.	8	Section 3.2.2		As per prior comment #8 on the 30% Submittal, please provide a justification of the free oil value of 1%. Is this 1 % by weight? Dry or wet weight? Sediment containing up to 1% free oil might be acceptable in limited quantities, whereas large quantities of sediment actually containing 1% oil would likely cause negative environmental impacts, such as sheening in the CDF with possible release of sheen over the weir. Suggest establishing a 1% oil maximum concentration and a 0.1% oil average concentration for any material to be accepted into the CDF. What is the procedure and analytical method used to determine free oil? First bullet: Visual field observation to estimate 1% of the area is not possible to do accurately. A better qualitative criterion would be “no observed free oil” – or drop the qualitative criterion.
19.		Section 3.3		According to this section, the geotechnical concerns include obstructions to future deep pile foundations, long-term secondary consolidation and gas generation. The following considerations should also be addressed, at a minimum: In addition to secondary consolidation, the anticipated primary consolidation properties of the sediment to be placed in the CDF should be estimated, including coefficients of compression and recompression, and consolidation time. If consolidation settlement is expected to occur, recommendations should be made regarding pre-loading or some other plan to reduce consolidation settlement at final grade. Consideration should be given to the anticipated final use of the area. It should be noted that in accordance with the 60% Design Analysis Report, Appendix C, Section 4.6.3.6, consolidation settlement will be monitored in order to compare actual values to predicted values and estimate a total consolidation time. Permeability of the sediments to be placed in the CDF should be estimated.

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20.	9	Section 3.3		Second and third bullets: Please define for each what constitutes "significant organic debris." Need to define "significant" and then relate to a quantitative test. For example, TOC analyzed by method XXX should be less than X %. The current criterion is not appropriate and very subjective. Please provide additional description of the size of debris to be excluded from the CDF.
21.	9-15	Section 3.4		This section is essentially the same as that in the DAR when discussing the acceptability of the T4 Slip 3 waste, please refer to related comments on the DAR A major issue is the compliance points for the ecological WQC and human health WQC and MCLs/tap water PRGs. The compliance point for the aquatic WQC is at the "face of the berm" (not sure where this is), for the human health WQC (in the receiving water 10 cm from the berm face) and for the MCLs/PRGS in the receiving water 10 meters from the berm face). Given the tidal influence on the berm and the flow of the river, this essentially provides for unlimited dilution, even of constituents that are bioaccumulative chemicals. It makes no sense to remove sediments from the river and then allow essentially unlimited discharge of bioaccumulative contaminants back into the river from the CDF during the months/years of CDF filling. Monitoring (modeling) should be within the berm near the inside of the CDF for all criteria. In Table 2: • The drinking water MCLS/PRGs and fish WQC criteria are not the actual criteria, but are those values (BCOC Groundwater Criteria and DCOC Groundwater Criteria) listed in Table 3. These values are developed assuming that monitoring will be done in the receiving water and are based on the fact that there will be massive dilution from groundwater in the berm, tidal influence, and the river. As stated on page 13, estimated (from tests such as the PCLT) or modeled groundwater chemical concentrations will only be compared to the criteria in Table 3. • Sediment criteria should include consideration of bioaccumulative potential. • The criterion for each chemical should be listed, not the solubility limit. • For PAHs, a WQC for human health should be added that is Total B(a)P equivalents with the B(a)P WQC as the criterion. • The background levels in the tables should be considered draft for now as new ones will be available based on the PH RI surface water sampling upstream of the PH Superfund site. • See Table 1 attached to DAR Comments. Please coordinate Table 2 and Table 6 of the DAR with Table 2 of the SACTM. Please coordinate Table 8 of the DAR with Table 3 of the SACTM.

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22.		Section 3.4		The statement "when allowance is made for mixing and attenuation of contaminants during subsurface transport through the fill materials and the berm" is too broad to mean anything useful. Note that it is in the same section that "predicted groundwater dilution and attenuation factors (DAF) are introduced. The combination of the statement, together with the lack of exactness of the DAF concept, leaves too much uncertainty to be of value in any acceptance criteria. This section will need to be more specific to provide useful site criteria.
23.	9-10	Section 3.4.1		Sediment screening criteria for contaminated sediments to be placed into the CDF are provided in this section and Table 2. These sediment criteria are based only on benthic toxicity criteria (e.g., PECs). Such criteria (listed by chemical in Table 2) do not address the bioaccumulation potential of sediments in the Harbor (e.g., from PCBs, TBT, and DDX). In addition, the list of chemicals is limited. Analysis of wastes considered for acceptance should include the full suite of analytes and use the same use the analytical methods used for sediments in the PH RI, unless a decision has been made as a part of the ROD or based upon site specific basis that such analysis is not necessary. Manganese and iron should also be included. The "Draft PH" criteria listed in Table 2 (Column 4) should be deleted as there is not agreement by EPA and its partners that these criteria developed by Windward for the RI are acceptable. An alternative preliminary set of criteria have been developed by EPA for the same chemicals using the same data set (the benthic toxicity test done as a part of the RI) and many of the values are very different. I recommend that we use the screening PECs/TECs that were provided for the Arkema RAA and that are being developed by EPA to review the RI data for the RI Round 2 Report. (Please contact Eric Blischke for the most up-to-date PECs/TECs).
24.	10	Section 3.4.1		First sentence top of page. Please clarify specifically 1) what considerations will be made regarding the bulk sediment and 2) how, if at all, the results of these considerations will determine what PCLT testing will be performed. The second bullet below indicates that, for organic constituents, PCLT testing will be conducted on any one exceeding the PEC or SQG values as applicable. However, for metals the procedure is unclear. Will PCLT tests be performed for all metals, regardless of exceedances of screening criteria? Please clarify.
25.	10	Section 3.4.2		First sentence: It is unclear if this reference should be to Section 5 rather than Section 6.
26.	10	Section 3.4.2		First paragraph: the words "estimated or modeled" are used many times. What procedures would be used to "estimate" the concentrations?
27.		Section 3.4.3		Drinking Water Standards- The TM states that drinking water guidelines & criteria are applied at the tap & not at the point of discharge. EPA has previously advised the LWG that drinking water standards should be considered in the river because contamination can be an adverse impact to the beneficial use of the water body.
28.	10-11	Section 3.4.2.1		Need to add a paragraph on other organic compounds besides PAHs (VOC, DDT, PCBs, etc.).

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29.	11			First full sentence at top of page: Please clarify “evaluation of sediment leachability.” Does this refer to results of the PCLT testing?
30.	11			Please revise this section consistent with comments on the DAR and requirements as listed in Table 1 (attached to DAR).
31.		3.4.2.2	Yes	The text asserts that fish consumption criteria (i.e., fish consumption AWQC) "should be applied to conditions in the receiving water in consideration of the spatial and temporal scales of interest". The text also says 1) the "bioaccumulation-based discharge criteria would be temporally averaged over a 70-year human lifetime"..., and 2) that fish consumption criteria would be achieved 10 cm above the face of the berm...,, and 3) "achieving chronic water quality criteria at the point of groundwater release from the CDF will be implicitly protective of bioaccumulation exposures in the receiving water". To date, there is not general agreement for the Portland Harbor project that "spatial & temporal scales of interest" approach is reasonable and defensible. Retaining this approach in the T4 document potential establishes a precedence for the broader Portland Harbor project, which is premature at this time. Additionally, the approach may not be fully protective of benthic receptors. EPA has provided Table 1 attached to the DAR to clarify applicable requirements for the CDF discharge. This comment applies to Section 7.1.2.2 as well.
32.	Section	3.4.2.3	Yes	Shall be completely rewritten. EPA directed the Port to use tap water PRGs, MCLs, and other levels as performance standards. This section is not written consistent with that directed comment and it is not relevant whether ICs will limit the use of groundwater in the area of the CDF. EPA will provide specific text to the Port for inclusion in the 100% DAR regarding this issue.
33.	Section	3.4.2.3		Drinking Water Standards: The TM states that drinking water guidelines & criteria are applied at the tap and not at the point of discharge. EPA has previously advised the LWG that drinking water standards should be considered in the river because contamination can be an adverse impact to the beneficial use of the water body.
34.	14			Paragraph 3: There will be bacteria in the dredged materials.
35.	15			First paragraph (continued from previous page), last sentence: This sentence references Section 6 for a description of the mercury loading analysis. However, it appears that this is not the correct reference. Please correct the reference or provide specific information in the section as to how the Hg loading analysis will be completed.
36.	15			Second paragraph: Please list specifically the 303(d)-listed parameters and describe briefly how they were evaluated or provide a reference to another section of the document.
37.	15			Paragraph 2: The 303(d) listed parameters should be provided in this section. The evaluations conducted should be provided in detail (“listed parameters were evaluated”).

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38.	Section	3.4.2.4		The only discussion of loading for contaminants other then mercury is in the last paragraph of Section 3.4.2.4. Based upon the problems with the modeling and the use of compliance points that allow for massive dilution, the Port has not been able to show that "the CDF is protective of the river" for 303 (d) listed parameters.
39.	16			Paragraph 1: what are the other "qualitative factors"?
40.		Section 3.5		Permeability of the fill used to construct the berm should be estimated.
41.		Section 3.5		This section is not complete as written. Contaminant concentrations used by the M&B cleanup are to apply in this case for clean fill material being imported. This should be made clear in this section that testing will be required per XX cubic yards (specify in text) to ensure that contaminant concentrations are as approved and revised throughout the design.
42.	18	Section 4.2.1	Yes	A DMMU of 100,000 CY is too large to be characterized by compositing 3 to 4 cores. Please revise.
43.	18	Section 4.2.1.1		Second sentence: Please define acronyms MET and CST.
44.	19			Paragraph 2: Individual core samples should be analyzed, not composite samples.
45.	19			Last bullet list: Need to add TOC and method number. Need to add TPH and method number. Need to be more specific on analytical methods (e.g., 6020 vs. 6000 series).
46.	19	Section 4.2.1.1		The proposed sampling scheme for candidate sediment should mirror the CERLCA RI/FS process. For CERCLA, sediment cores are typically not composited over long lengths and multiple sample locations. Establishing sampling requirements that are not consistent with the CERCLA process will result in duplicative work and schedule delays.
47.	Section	4.2.1.1		The last paragraph in this section states that samples will be a composite from 3 to 4 cores systematically distributed throughout the proposed dredge prism. It seems that the number of sampling cores should be dependent on the depth of the prism and the area of the prism. Perhaps this should state a minimum, and the exact number will be based on some statistical sampling which can provide sufficient control on the sampling variability of the sediment mass. It would be best if there were enough cores to make the results statistically valid, more in the range of 20 to 40 samples composited for analysis, or enough other point data that some estimates can be made beyond the 3 to 4 cores suggested in this section.
48.	19	Section 4.2.1.1		As previously instructed, this section shall include a sentence, "Additional sampling locations may be required." TMDL WLAs need to be evaluated once these are available as material acceptance criteria.

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49.	19-21	Section 4.2.1.2		Given the problems with the GASCO removal, it is not clear that the tests (e.g., TCLP) are accurate predictors of what is truly soluble during dredging and in the initial weeks following placement of the dredged material in the CDF. In addition, some of these tested provide for a large dilution factor (1:250) before being modeled and compared to criteria. The test with the lowest dilution (the MET) will only be used if overflow of the CDF weir is expected which completely ignores impacts from the CDF berm.
50.	19	Section 4.2.1.2.1		Please clarify if TPH analyses will include diesel, gas, and/or oil range hydrocarbons?
51.		Section 4.2.1.2.1		Bulk sediments should also be analyzed for chlorinated dioxins and furans, consistent with sediment characterization for the Portland Harbor site.
52.	21			First paragraph after first bullet list: see previous comments about PCLT test (30% design comments). That is, tests should be performed until concentrations level out (not set number of pore volumes) and then rebound tests should be conducted. Conductivity or other real time parameters should be measured to select samples for analyses. Initial pore volumes should always be analyzed. Consider analyzing the 0.5 pore volume.
53.		Section 4.2.2		The results on figures 4-9 and 4-10 are not correct. These figures are based on using the Kd values from the fill material. During filling, the source concentrations are not attenuated by the fill material (the fill material is the source). Attenuation occurs only in the berm. In addition, the properties of the berm provide little attenuation.
54.		Section 4.2.3		In the fourth bullet, TCLT should be PCLT. Figure 4-11 is difficult to interpret because none of the lines are labeled or have values. Figures 4-12 through 4-17 are based on apparently incorrect calculations, use inappropriate values and are based on suspect results of only one sample. More detail should be provided to verify the values and techniques used.
55.	22	Section 4.3		Provide additional description of data validation requirements and data quality packages to be submitted with SCR.

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56.	23-24			Pg 23, last paragraphs and pg 24, first two paragraphs: These evaluations appear to have been performed incorrectly. Use of figure 6 is not appropriate. The PCLT tests provide direct results of leachate quality. These results (i.e., highest concentrations) should be used directly in the model as the source concentrations. The Kd or R for the berm materials (not the fill material) should then be used to predict concentrations on the face of the berm. Using a calculated Kd for the fill material is not appropriate. This assumes reactions and attenuation in the fill materials. In reality, the initial pore volume concentrations will enter the berm material and not be attenuated or diluted. In addition, the Kd values were not calculated correctly for column studies. For column studies, the concentrations should be compared to conservative tracer concentrations. Either the mass under the curves or the half-concentrations of the tracer and COC should be used to more accurately calculate Kd values. Use of organic carbon content ratios is not appropriate to calculate Kd values for metals in the candidate sediments and the berm materials. Only organic compounds have well defined relationships with organic material.
57.	24	Section 4.4.1		The value of 0.1% TOC in berm material appears to be a critical factor in achieving the predicted chemical attenuation. For the 100% Design Submittal, please provide TOC test results for several candidate berm fill materials. Establish the TOC value as a requirement in the material specifications and provide TOC monitoring of import materials during construction.
58.		Section 4.4.1		The proposal is to have the calculations done at the berm face on the river side. It will be hard to do any retrofitting of the CDF if the calculations prove to not be conservative; therefore, it seems more protective to model the ground water at the inside of the berm, near the CDF sediments, or in the middle of the berm, where if we need to install monitoring wells the monitoring can verify the modeling. In addition, it will be necessary to only use conservative values model parameters to prevent getting too optimistic of a modeling result.
59.		Table 4-4		The method used to calculate the Kd values should be given. In the headings, the “TCLT” should be “PCLT”.
60.	23-25	Section 4.4.1 and 4.4.2		The Tier I and Tier II evaluations make the assumptions that the impacts from CDF filling have been modeled correctly, that the tests being done on waste are accurate predictors of soluble constituents, that the compliance points/dilution to meet large multiples of the criteria values in the river are appropriate, and that loading is adequately dealt with through dilution. None of these seem supportable.

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61.		Section 4.4.3		Additive Effect: A comment on the previous "Sediment Acceptance Criteria TM" asked how additive effect will be evaluated? For instance, if sediment with high levels of contamination is placed in the CDF away from the berm and lower level contamination is placed closer to the berm…, how will the cumulative effect of groundwater impacted by both sediments be evaluated?
62.		Figure 4-5		This figure is difficult to interpret with all lines on top of each other, most of the figure being blank and some lines not labeled. This figure should be redone with y-axis from 0 to 4%, etc.
63.		Section 5		Based on above comments, the conclusions concerning predicted concentrations may not be correct. Please address all comments on the fate and transport modeling and provide an interim deliverable prior to the 100% design document that addresses these issues.
64.	29	Section 5.2		See previous comment concerning pg 23.
65.	30			First paragraph: See previous comment. Use of Figure 6 is not appropriate.
66.	30			Last paragraph: This paragraph was apparently not completed.
67.	31	Section 6.1		Treatment methods that destroy or remove contaminants from sediments may be acceptable; however, treatment methods that immobilize contaminants are not acceptable. Please revise the text accordingly. Please note in the text that if treated sediments are accepted into the CDF, post-treatment monitoring will be required.
68.		Appendix I Table 4-1		CONTAMINANT TRANSPORT MODELING: Table 4-1: The hydraulic conductivity values for the fill material are not correct as shown in the table. For example, 0.0013e-3 should be 0.0013. This is still a very low value given the Material description of “sand”. Apparently, the material description needs to be changed. The units for “fraction organic carbon” are given as “%”. The fraction organic carbon (foc) should not have units. That is, a foc of 0.1 is equal to an organic carbon content of 10%. We assume that the values given in the table are “percent organic carbon” and not “fraction organic carbon”. This should be cleared up. The bulk density values given for all material are high given the relatively high water content under saturated conditions. Please revise values lower and provide justification for the values used. The two headings for “Berm” should be different (fill and training material). The foc for these materials is too high given the nature of the material (well sorted sand and gravel; quarry spalls). Provide test results for representative samples of prospective source materials as an interim submittal prior to submitting the 100% design.
69.		Appendix I, Figure 4-2		Modeling at a Willamette River stage of 5 NGVD should provide a conservatively high gradient to the river, and it is within a reasonable range, as shown in Figure 4-2 of Appendix I.

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70.		Table 4-1		The fill hydraulic conductivity of 0.0013 feet/day in Table 4-1 seems to be way too low. In addition it is not clear whether it is 0.0013 or 0.0013e-3 (Note the difference between table and footnote a). The berm hydraulic conductivity, by comparison, is between 16 and 450 ft/day. Please discuss in detail and give an uncertainty range of the results that would occur with the use of those values in calculations. More detail on these topic on my other 60% document comments.
71.		Table 2		The table does not have minerals such as manganese or iron. These may not be direct contaminants, but seem to be regularly at levels above screening values in Portland Harbor and should be considered as the CDF is planned.
72.		Figure 6		This figure appears in the last page of the report, and it seems a bit unrelated to the text or to other data developed in this report or in the DAR. Since the figure plots DAFs over orders of magnitude, it should be discussed in the text as to how it was developed and what the significance of it is. Furthermore, Kd's are also very variable, especially for metals, and to simply select a value from literature may be misleading. Since the values are based on ground water model predictions, the implication that those values may be similar to actual field data may be somewhat speculative also and some such limitation should be given in report. This figure needs to be explained in terms of how those values plotted can be verified by field data prior to using them in the final CDF design, as presented here they are modeled values which are further manipulated into a regression. While the plot looks reasonable smooth at this scale, it is the validity of the original numbers plotted, and how that relates to Kd's that needs more discussion and support.