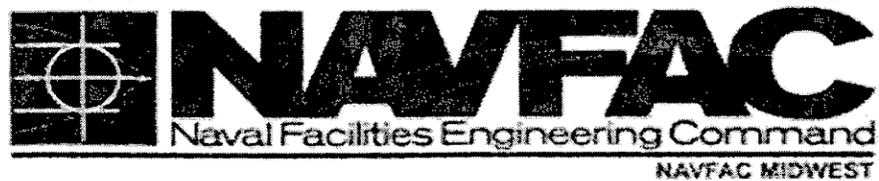


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ENVIRONMENTAL DESIGN REVIEW FOR REMEDIAL ACTION PLAN PETTIBONE CREEK
NS GREAT LAKES IL
7/5/2011
NS GREAT LAKES



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NAVFAC MW EV IPT			DATE:
ENVIRONMENTAL DESIGN REVIEW			Beginning 7/5/11 through 9/19/11.
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RAP Pettibone Creek			
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NAVFAC LANT			7/5/2011
1	Global Tom Spriggs - 7/5/11	1) Figures lack sufficient detail to understand how they fit into the larger picture. Each individual figure should provide information so they can stand alone and be understood while also referencing where/how they fit into the entire stream restoration. Figure 6-3 comes close to doing this, but only references the location of each, not showing the structure itself.	The details depicted in the figures have been centrally located on Drawing C-7. A new drawing, C-1, "Overall Site Plan" has been added that depicts the proposed stream back restoration features. Also, two new drawings, C-2 and C-3, present an enlarged view of separate halves of Pettibone Creek and their suggested, selected stabilization remedies.
2	Fig. 6-3 Tom Spriggs - 7/5/11	2) Side channel wetlands are referenced though no figures are shown. Need cut, plan, profile sections plus details on overflow structures etc. to illustrate how these fit into the larger stream restoration.	Three new drawings, C-4, C-5, and C-6, will be included in the next submittal that provide plan views and cross sections of Flood Plains A, B, and C (the term "Engineered Side Channel Wetlands" has been changed to "Engineered Flood Plains"). The locations of Engineered Flood Plains A, B, and C are depicted on Drawings C-1, C-2, and C-3.
3	Fig. 6-4 Tom Spriggs - 7/5/11	3) Unsure what the A-Jack provides to the restoration effort from this figure. Is this a cross-section view? Plan view? "Illinois" is mis-spelled in the title block.	A-Jacks are no longer being considered as a suggested stream bank stabilization alternative. The ERTEC stream bank stabilization system (BANK GUARD) is instead being recommended in it's place due to the simplicity of installation and potential cost savings. Note that the details provided on individual figures have been centrally located on one Drawing C-7.
4	Fig. 6-5 Tom Spriggs - 7/5/11	4) Define "LWD" (large woody debris?). This figure lacks definition to describe how the stream bank will be stabilized. Is this a cross-section or another view? This figure should reference Figure 6-6. What is the purpose of the "live willow stakes" and what is the difference between the LWS and wooden pins? Assume the willows are to establish new growth. What is the horizontal line at the top representing? How will the root wad or LWD be installed and kept in place? From the text, it says boulders and a footer log will be used, where are they on this figure? How will the root wad be secured to the footer log? How will the geotextile matting be kept in place along the bank and keyed into the root wad as illustrated? What does the dashed line presumably in the channel bottom represent? What will be used to keep the root wads in-place, especially during high flows? Have these been used successfully under similar flow conditions? Based on current scouring observed onsite, I have reservations that these LWD structures will be effective in the long-term. Suggest investigating other erosion control structure methods (ERTEC vertical tubes systems, www.ertecsystems.com) that could serve a dual purpose, stabilizing the banks and providing structural support for new plant growth.	See response to Comment 1 and 3 above.
5	Fig. 6-6 Tom Spriggs - 7/5/11	5) Same comment as #2, this system of integrating tree roots into stream banks as erosion control devices, though intriguing, does not appear viable from an engineering perspective. Where would these trees come from? How are they anchored? "Illinois" is mis-spelled in the title block.	See response to Comment 1 and 3 above.

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6	Fig. 6-7 Tom Spriggs - 7/5/11	6) According to Fig. 6-3, these log structures appear to be for slope stabilization, is this true? Please describe how the log vane will accomplish this. When water at low-flow and at higher flow conditions cascades over the logs, there will be increased turbulence downstream of the logs. What measures are in place to prevent scouring? How are these structures secured in the stream bank and stream bottom? As illustrated, there doesn't appear to be protection for the logs under high flow conditions to prevent erosion and eventual catastrophic loss of the structure under high flows. From the site walk, it was observed that historical flows pushed several ton rock gabions sideways in the streambed.	See response to Comment 1 and 3 above. Log vanes are anchored into the stream bank and provide energy dissipation, rather than stream bank stabilization, as is provided with the ERTEC stream bank stabilization.
7	Fig. 6-8 Tom Spriggs - 7/5/11	7) What are the two circles in the plan view downstream of structures? The legend describes the dashed areas of rock as "footer rock", but in the profile, the rock bed appears to be floating in the water. What is the intent here? Where are the scour holes as shown in the profile? What is the channel sub-pavement? The cross-section does not appear to correspond with the plan or profile drawings. What are the two trenches for? Where is the cross-section cut in the plan drawing?	See response to Comment 1 above. The J-Hook detail was revised and provided on Drawing C-7
8	Fig. 6-9 Tom Spriggs - 7/5/11	8) This figure makes no sense. Is the designer referring to "cobble" as part of the bank stabilization? At a minimum, we need arrows pointing to individual components; better yet, more detail of the stringer/fiberdam structure is needed (plan, cut sections). Define a "Lunker" How does this structure fit in the stream system? "Illinois" is mis-spelled in the title block.	See response to Comment 1 above. The detail for the bankfull bench has been replaced with the ERTEC Stream Bank Stabilization detail. Note that ERTEC has replaced the bank stabilization system initially presented in the last submittal with a different bank stabilization system (Bank Gaurd). A product description, installation guide, and technical specification sheet are provided in Appendix M.
NAVFAC ENV			8/4/2011
9	3.14 and Figure 3-4 ED	9) The primary traffic route to the site is from the north branch. This entrance is steep and has a very sharp turn on the hill. Will construction vehicles be able to make this turn?	The contractor that will do this work will need a laydown area for equipment and supplies. The area south of Building 6224 and west of Building 112 above Pettibone Creek could be used as this laydown area. The equipment that will be used to conduct this work would consist of small equipment, such as bobcats, small tracked backhoes, etc. These small construction vehicles will be able to make this turn - We have seen a school bus make this turn. The other entrance could be by the Boat Basin, however a convenient laydown area would need to be established.
10	Site 17 Traffic Plan ED	10) The Primary entrance is through the MLK St. Gate. There is no road as depicted in this figure immediately to the right entering the gate as shown.	The primary access route will be moved by 1 block to the east using Sampson Street. Also, Figure 3-4 has been changed to Figure 3-3 and will be updated to reflect the correct traffic pattern. Figure 3-3 in the last submission has been removed.
11	N/A BS	11) One of the primary goals for this Remedial Action Plan is to prevent contaminated sediment loading from off base sources into entering Pettibone Creek. If the northern sedimentation basin is not feasible in this project than a removal or NFA would be out of the question. No point in this report is a design of a northern sedimentation basin. Their needs to be a design/submittal section, included in this report. The northern sedimentation design section must also include a narrative which should include but is not limited to all design aspects; water flowrate and velocity, pipe size, particle size, detention time, storm intensity ie. 5, 10,25, sediment loading volumes. After this is completed a conclusion and recommendation narrative must be written. If the sedimentation basin is not feasible after it is designed, than a detailed explanation is required. A flowchart is also recommended for the design of the sedimentation basin. The flowchart should identify all key design aspects.	Based on the design calculations, the hydrology and hydraulics required a sedimentation basin that was larger than this area could provide. The basin calculations have been performed to evaluate the size of a basin needed to accommodate design storms ranging from 1 to 10 year and the 100 year storm event. These calculations are provided in Appendix P. As a result of further discussions, additional sampling will be conducted for benthic macroinvertebrates to compare to the reference stream (South Branch of Pettibone Creek). As part of this additional sampling sediment samples will be collected for chemical analysis and sediment samplers will be installed in the culverts using PVC pipes and filter socks to collect suspended sediment that is flowing in Pettibone Creek from the upstream area. These samples will be analysed for PAHs, Pesticides, PCBs, and metals and will be used to determine if contaminated sediment from off base sources is entering Pettibone Creek at the Navy property. This is a 1 time sampling event and the information and decisions will be based on this 1 sampling event.
12	6.5.7 BS	12) Restoration will be conducted on all disturbed areas of the site. The restoration will incorporate native species and be astatically pleasing.	Section 6.5.7 will be expanded to describe restoration of disturbed areas and will refer back to Section 4.4 that describes the restoration of disturbed areas.
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13	Doro	13) Fansteel and NRCS no longer have operations as depicted on Site Vicinity Map - Site 17- Pettibone Creek RAP	Figure will be revised to say "Former".
14	Doro	14) recheck the industries that are located along the North Branch of Pettibone Creek upstream of NSGL	EMCO is the only facility to our knowledge. The EMCO facility will be labeled on the drawing.
15	Doro	15) Calculation sheet is for "Northern Branch Pettibone Creek" but the Soil Map AOI includes the entire Mainside of NSGL up to Lake Michigan, as well as the other Branches of Pettibone Creek. The sediment loading calculations for the North Branch must reflect the actual watershed of the North Branch. The AOI does not represent the Watershed depicted in Section J Flow calculations.	The sediment loading calculations were performed for the North Branch of Pettibone Creek only. An additional figure is included with the calculation depicting the North Branch delineated watershed and the soil existing within it.
16	Doro	16) The Sun-Area Time of Concentration Details lists the velocity of all 3 sub-areas channel flow at 8ft/sec. How was this number calculated, it seems high, which lowers the Tc and increases the peak flow.	Previous reports indicated the North Branch of the creek has a short time of concentration (Tc), or time it takes for a unit of water to run the watercourse. The Tc is short because the water source is primarily from an urban area that has low infiltration rates (fast run-off rates) during storms. As a result, Pettibone Creek is susceptible to flash floods characterized by high channel velocities and increased erosive potential. Tetra Tech will revised the Tc using WinTR-55 and used only sheet and shallow flow for the Tc, based on the fact that we are looking for the longest Tc into Pettibone Creek and the storm sewer and channels are going to reduce the Tc. Additionally, the original calculation was found to have an error which was corrected and brings flow and velocity in line with the peak flow calculations.
17	Doro	17) Please re-examine the sub areas depicted. There are several outfalls along Lake Michigan that do not flow into Pettibone Creek.	Tetra Tech reviewed the Spill Prevention, Control, and Countermeasure (SPCC) Plan dated November 2010 that includes drawings showing the stormwater system at Naval Station Great Lakes and the Lake County Watershed Map showing the Pettibone Creek watershed. In the SPCC plan it shows several outfalls along Lake Michigan that are associated with Ziegemeier St. and some of the facilities along the top of the bluff. However most stormwater from the Main Base and Hospital side is collected and piped to outfalls along Pettibone Creek (North Branch and South Branch). Tetra Tech will revised the areas based on existing mapping of Lake County Watershed Map. Based on the revised area of the North Branch, the new area 1 is 2439 acres. On the Lake County Map the area for Pettibone Creek is 2721 acres. This difference is minimal and the approximate 300 acres is along the bluff and it is due to the present information obtained from topo maps.
18	Doro	18) In the tables that show the Simulation Runs for the various size storms, the last column "Volume" is listed as "IN" which is a unit of length, not volume. Please clarify the units for this.	The table in question is unedited output of the HEC-HMS Hydraulic Modelling System program. The units of volume are correct in that they are expressed in volume of inches as computed by dividing the volume by the drainage area.
19	Doro	19) The primary traffic route to the site is from the north branch. This entrance is steep and has a very sharp turn on the hill. Will construction vehicles be able to make this turn?	The contractor that will do this work will need a laydown area for equipment and supplies. The area south of Building 6224 and west of Building 112 above Pettibone Creek could be used as this laydown area. The equipment that will be used to conduct this work would consist of small equipment, such as bobcats, small tracked backhoes, etc. These small construction vehicles will be able to make this turn - We have seen a school bus make this turn. The other entrance could be by the Boat Basin, however a convenient laydown area would need to be established.
PWD-Env. Div.			8/24/2011
20	B.Vanbendegom	20) OICC - Currently used/applied acronym ??	OICC was used on page 3-10 of the report. If the OICC has been changed please provide the new title
21	B.Vanbendegom	21) Section #1.2: NSGL covers 1,2002 (which excludes PPV Houing Villages) vs 1,632 acres	The text will be changed to reflect a base size of 1,202 acres.

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22	2-1	B.Vanbendegom	22) Section #2.1.1: Banks of Pettibone Creek are forested with deciduous trees & other wood vegetation vs European Larch, white & Scotch Pine. Were & white oak trees identified within the proposed project area ?? Verify trees listed.	The trees listed in this section were obtained from an earlier version of the INRMP. The most recent version of the INRMP was provided during the review of this document. This section will be revised based on the most recent version. This section will be changed to "the vegetation consists of elm (Ulmus spp.), mixed oaks (Quercus spp.), sugar maple (Acer saccharum), silver maple (Acer saccharinum), boxelder (Acer negundo) and ash (Fraxinus spp.). Shrubs include blueberry (Vaccinium spp.), huckleberry (Gaylussacia spp.), blackberry (Rubus spp.), and immature trees of the overstory as well as willow (Salix spp.), red osier dogwood (Cornus stolonifera), sassafras (Sassafras albidum), and black oak (Quercus velutina)."
23	2-10	B.Vanbendegom	23) Section #2.3.3, last 2 sentences: Piscivorous birds such as State protected Common Tern, do feed within proximity to the boat basin & are directly impacted by Pettibone Creek. Refer to: "The biological pathway and effect of PCBs on common terns in Lake Michigan" by Michael P. Ward, et al; Ecotoxicology (2010), 19:1513-1922 - a publish research project conducted on NAVSTA Great Lakes.	Comment noted. The last 2 sentences were conclusions from the RI/RA report that included a site-specific baseline ecological risk assessment dated September 2003. The text will be changed to state that there is uncertainty in whether piscivorous birds will obtain a significant portion of their diet from Pettibone Creek and the Boat Basin, not that significant numbers of the birds are not feeding in the area.
24	Table 2-2	B.Vanbendegom	24) Piscivorous Birds, Chemical of Concern: Add 'Aroclor-1254' as identified in aforementioned research paper.	The table was from the RI/RA report that included a site-specific baseline ecological risk assessment dated September 2003. The inconsistency with the sentence on page 2-10 will be reviewed and corrections will be made based on the site-specific risk assessment.
25	3-2	B.Vanbendegom	25) Section #3.1, 1st paragraph (i.e. Sediment Processing): Will this process step separate or remove C&D debris ??	C&D concrete and rock debris will be removed during this processing step if it is greater than 3 inches. The bottom of page 3-4 and top of page 3-5 indicates man-made materials will be stockpiled for off-site disposal. This would apply for C&D debris.
26	3-3	B.Vanbendegom	26) Section #3.2.1, 2nd paragraph, 3rd sentence: 'The portable dam will be located on the upstream end of each construction increment. Verify - is this correct, i.e. upstream end or should it be down stream end ??	Up stream end is correct so that the sediment removal can be completed in a dry creek bed.
27	3-4	B.Vanbendegom	27) Section #3.2.1: Reuse of man-made, C&D debris, etc. on sight is not permitted.	The bottom of page 3-4 and top of page 3-5 indicates man-made materials will be stockpiled for off-site disposal. This would apply for C&D debris.
28	3-10	B.Vanbendegom	28) Section #3.2.12: Tree removal shall be approved by the NSGL Natural Resources Program Manager.	Text will be added to Section 3.2.12 indicating that tree removal shall be approved by the NSGL Natural Resources Program Manager.
29	3-13	B.Vanbendegom	29) Section #3.5.2.: Based on the DEC 1999 Wetland Delineation Report for Naval Training Center Great Lakes - Pettibone Creek & its adjacent banks do not qualify as jurisdictional wetland. The channel itself does qualify as a jurisdictional 'waters of the United States' below the OHWM.	Section 3.5.2 will be edited to indicate that Pettibone Creek and its adjacent banks do not qualify as jurisdictional wetland though the channel itself does qualify as a jurisdictional 'waters of the United States' below the OHWM.
30	4-4	B.Vanbendegom	30) Section #4.3: Use of fertilizers during reseeding, etc. is prohibited.	Text will be added to Section 4.3 to indicate that the use of fertilizers during reseeding and other related activities is prohibited.
31	4-4	B.Vanbendegom	31) Section #4.4: During high rainfall events, mulching along stream beds could easily erode; Not recommended.	Alternative mulching approaches will be evaluated for disturbances to existing ground along the stream bed and discussed further in Section 4.4.
32	4-5	B.Vanbendegom	32) Section #4.5: Contractor is allowed maximum of two ASTs on site not to exceed 500-gal total capacity. Temporary ASTs shall be inspected & approved by NSGL Fire Dept and PWD-Environmental Division before initial filling.	Text will be added to Section 4.5 indicating that only two Above Ground Storage Tanks (ASTs) will be allowed during remediation activities and the maximum allowable volume of each tank shall be 500 gallons. Also Temporary ASTs will be inspected and approved by the NSGL Fire Dept and PWD-Environmental Division before initial filling. The acronym "AST" will be added to the List of Acronyms on page vi.
33	4-6	B.Vanbendegom	33) Integrate current Spill Procedures into document (copy provided).	The Naval Station Great Lakes Spill Procedures (as provided by the file that was provided with the comments) will be referenced in Section 4.5 and included as an Appendix.
34	6-2	B.Vanbendegom	34) Recommend posting information signs adjacent to adapted stabilization & sediment collection features, such as - Rootwads; Log Vanes; etc. - otherwise they will be perceived in future years to be un-necessary obstruction or debris and removed by unknowing persons.	Text will be added to Section 6.2 recommending that signage be placed near updated and sedimentation features such as Rootwads and Log Vanes indicating that they are intended to remain in place as installed.

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35	6-9	B.Vanbendegom 35) Section #6.5.7, re. replacement vegetation: Final seed & plant selection shall be approved by NSGL Natural Resources Program Manager.	The recommended plant list in the draft final RAP will be updated based on the plant list provided with the Navy comments (file that accompanied the comments). This plant list was approved by the NSGL Natural Resource Manager and NAVFAC LANT personnel
36	Appendix A, Photo #1	B.Vanbendegom 36) Appendix A, Photo #1: Recommend installation of metal mesh on upstream culverts. to prevent entrance of undesired debris into restored Creek.	Installation of a metal mesh on the culverts will catch debris however this could cause the culverts to become clogged and cause upstream flooding. This is not recommended. The Navy could request the City of North Chicago to install a trash rack type structure before the culvert near the intersection of the off ramp of Amstutz Expressway and 24th Street. A similar trash type struction could be also considered downstream of where the culverts discharge onto the base. In both cases these structures can cause upstream flooding if the debris is not removed.
LANT/Public Health Center			9/19/2011
37	general	PHC 37) We did not do an editorial review, but when an obvious typographical error was identified we have noted it below. Given the large number of editorial errors we noticed, we recommend that this entire document be reviewed by an editor.	An editorial review will be performed prior to the next submission.
38	1-2	PHC 38) Editorial: The first sentence in Section 1.3.1 states that an IAS was performed in 1986, but the reference given is for 1996. Either one of these dates is a typographical error, or it took 10 years to finish the report.	The reference date will be corrected to 1986.
39	1-3	Barclift 39) It is stated that this RAP is consistent with Navy Sediment policy "because implementation of this RAP will occur only after the upgradient contamination areas and potential sources to the proposed remediation area have been controlled." It continues to state that PBC is likely to be recontaminated with off-base contamination. This statement has several schedule and policy implications that need to be considered during the implementation and planning of this remediation. The most obvious policy implication is the fact that there does not appear to be direct Navy source of contamination that has been identified and there is likely recontamination by the same uncontrolled non-Navy upstream sources that likely caused the problem in the first place. The necessity to perform this action needs to be clearly justified throughout this document. Also, please discuss the schedule to implement this action in regards of the upgradient source areas being controlled.	Comment noted with regard to the Navy policy. With regard to project schedule, it is not possible at this point to complete a project schedule given uncertainties with funding availability and remedy selection. In regards to necessity to perform this action, as stated by NAVFAC Midwest personnel under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), persons may be held strictly liable for cleaning up hazardous substances at properties that they either currently own or operate or owned or operated at the time of disposal. Strict liability in the context of CERCLA means that a potentially responsible party may be liable for environmental contamination based solely on property ownership and without regard to fault or negligence. CERCLA imposes joint and several liability for cleaning up contamination caused by hazardous substances on four categories of responsible parties. Although agreements can be made to apportion liability between responsible parties, no agreement will shield any responsible party from CERCLA liability. CERCLA also imposed liability retroactively to contamination predating the act's passage in 1980. Finally, as discussed between the NAVFAC Midwest IPT, Navy NAVFAC Midwest, NAVFAC LANT, Illinois EPA, Illinois DNR, the US Army Corps of Engineers, and Tetra Tech during the November 4, 2011 meeting held at the Naval Station Great Lakes, it was essentially agreed upon that the RAP will be completed based on the assumption that the remedial action is being mandated by the Illinois EPA.
40	2-1	Barclift 40) Section 2.1 - please reference NAVFAC's RERA in Appendix G in the first paragraph.	Reference to the NAVFAC RERA will be added as the last sentence of the first paragraph of Section 2.1. Note that the Appendix containing the RERA has been changed to Appendix C.
41	2-3	Barclift 41) The statement, that non-Navy sources "...have contributed to elevated concentrations of contaminants in Pettibone Creek..." calls into question the necessity for this remedial action. Statements such as these need to be tempered with evidence of specific Navy sources of contamination to justify this action will comply with the Navy sediment policy.	See response to Comment 39.
42	2-4	Barclift 42) 2nd paragraph - in this section and throughout the document, please remove all text pertaining to the Boat Basin. It is my understanding that this RAP only addresses the North Branch of PBC.	It is understood that remediation of the Boat Basin will not occur during this remedial action. However, given the importance of the Boat Basin as being the ultimate receptor of past and future sediments, it is appropriate to leave text referring to the Boat Basin not implying specific remedial action.

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43	2-4	Khoi Nguyen	43) Sec. 2.3 - The 2001 and 2008 data indicate that there was an overall increase in the extent of contamination during this period. However, the extents of contribution from contamination sources and Navy activities that result in such increase have not been fully described in the current report. Cleaning the Creek as planned would result in a reduction of pollutant loadings into the lake. However, good knowledge of pollution sources is useful in enhancing the effectiveness of the stream remediation project and predicting long-term results. Recommend preparing a full comparison of the 2001 & 2008 sampling data; review outfall sampling data and activities associated with such discharges; characterize groundwater and soil conditions of source locations and the site; evaluate possible effects of groundwater contamination and contribution to the creek; review historical data related to source remediation activities.	Section 2.3 summarized the results from the 2001 investigation that was reported in the September 2003 RI/RA report. The results from the 2008 investigation are discussed in Section 2.5 of this report and a full comparison to the 2001 investigation is provided. The non-native sediment deposits (2001 investigation results - brown/tan silty sand) are much higher than the native stream bed sediment (2008 investigation results - blue gray clay). Table 2-4 also shows a side-by-side comparison of the results of the samples that were in the same area - just at different depths and a difference in the soil/sediment description. The table does show some exceedences in the native stream bed sediment but the number of exceedences and the concentrations in general are significantly less. The pollution sources for this site has been documented in many previous reports by USEPA, Illinois EPA, and the Navy - most of the pollution sources were from the upstream industries as mentioned in the historical section of this report. These industries are no longer in operation. Some pollution sources can also be attributed to the City of North Chicago and the Navy's stormwater systems as well.
44	2-5	PHC	44) This section discusses non-Navy, off-site sources for some of the constituents that were identified as COCs for the site. The text even states that, "...the analytical results available for the Site 17 area do not suggest that a signifant point source(s) from Naval Station Great Lakes is impacting the surface water/sediment quality of Pettibone Creek or the Boat Basin." In order for these constituents to be considered COCs warranting a clean-up by the Navy, these chemicals should all be tied to a Navy source according to the Navy policy.	See response to Comment 39. Also see comment 11 - an additional investigation will be conducted to determine the population and diversity of the benthic macroinvertebrates which were identified as a receptor of concern in the Ecological Risk Assessment from the original investigation. The need for a remedial action will be based on the results of this investigation.
45	2-5	Barclift	45) Please see my previous comment on page 2-3 and PHC comment above and below. The majority of text on this page points toward not having to do a remedy vs. having to perform an action.	See response to Comment 39 and 44.
46	2-6	Tom Spriggs	46) Noting comment above, is there a reason why the Navy is moving ahead with remediation and restoration if the potential sources are from upstream locations, off-base? The WCSD states the same. Doesn't this go counter to the CNO's <i>Policy on Sediment Site Investigations and Response Actions</i> dated 08 FEB 02 states: "All sediment investigations and response actions must be directly linked to Navy CERCLA/RCRA contaminated releases (BRAC and/or ER,N eligible). Directly linked means that the sediment contamination is scientifically connected to a Navy IR/BRAC site...All sediment investigations and response actions shall be scientifically defensible, technically feasible, risk-based, and cost effective." (emphasis added) If CNO or HQ has waived these requirements, consider stating this in Sec. 2.3.1.	See response to Comment 39 and 44.
47	2-7	PHC	47) Editorial: The Section of "Risks from...Sediment" says, "The ILCR for the adult recreational user exposed to sediment in the South Branch Pettibone Creek (E-06) was within the..." A number is missing in the cancer risk.	The inumber before the E is 1.6 from the RI/RA and FS report. This should be an integer and will be listed as 2.
48	2-7	Barclift	48) Risk from exposure to fish ingestion. Please clarify whether risk from fish ingestion was calculated using Boat Basin data or PBC data. I believe that risk from fish ingestion was based on Boat Basin data. If this is accurate, then this should be removed from the RAP since this document focuses on PBC.	Fish ingestion was based on samples from the Boat Basin. This risk will be removed from the RAP.

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49	Table 2-4	Khoi Nguyen	49) Data associated with Sample Nos. NTC17PSD48, __D11, __D14, __D17, and __D23 show exceedances of the PRGs for copper, lead, and zinc in the lower sediment samples compared with those associated with the upper sediment samples. Deeper samples to determine concentrations of the inorganics would be helpful in determining the extent of stream depth that needs to be cleaned up.	The non-native sediment deposits (2001 investigation results - brown/tan silty sand) are much higher than the native stream bed sediment (2008 investigation results - blue gray clay). Table 2-4 also shows a side-by-side comparison of the results of the samples that were in the same area - just at different depths and a difference in the soil/sediment description. The table does show some exceedances in the native stream bed sediment but the number of exceedances and the concentrations in general are significantly less.
50	Fig.2-4	Tom Spriggs	50) Is it possible that anthropogenic sources of PAHs are related to the elevated hits at D42 & D44? Can we exclude these from the risk assessment evaluation?	It is possible that anthropogenic sources of PAHs are related to the elevated concentrations. Illinois EPA in their TACO regulations have criteria for background PAHs that can be used for surface soil. A comparison with these criteria will be discussed in the RAP.
51	2-8 thru 2-10, App.G	Tom Spriggs	51) The Ecological Risk Assessment section needs revised. The 3rd paragraph (p.2-8) says PBC & BB do not support large fish populations, so the piscivorous exposure route is not expected to be significant, yet we retain 4,4'-DDE as a COPC. The same statement is repeated though it is contradicted several times in several places afterward. Why keep it as a COPC? If it's at the headwaters only (again, relates to an off-site source), then why can't the ERA reflect the limited area and remove it from consideration? Soil erosion is noted at the bottom of p.2-9 as being a physical stressor adding to the risk to aquatic organisms, but erosional soil is not identified as a COPC in the ecological RERA. What data do you have to support this? Add it or delete this sentence. This may bring up another point - are we removing sediment because it truly is a risk or are we trying to correct a physical stream erosion issue (non-ER,N funded issue)?	The RI, which was completed in 2003 did find unacceptable risks to piscivorous birds from consuming fish from the North Branch of Pettibone Creek and the Boat Basin. There are several uncertainties in the assessment, though. At the time the ERA was prepared, the NOAEL for DDT (which was also used for DDE and DDD) was 0.0028 mg/kg/day and the LOAEL was 0.028 mg/kg/day. Based on the new Eco SSL document for DDT, the NOAEL that is used is 0.227 mg/kg-day and the LOAL is 2.7 mg/kg/day. This would decrease risks by a factor of about 100 which would probably make risks acceptable. Also, the RI noted that the concentrations of pesticides are indicative of concentrations associated with typical applications of the pesticides when it was legal to do so. Therefore, although these chemicals were retained as COCs, the fact that they may not be site-related should be factored into any risk management decisions. The part about the physical stressors was included in the RI just to note that there are risks from other stressors than just chemical stressors. The greater risks in the creek are actually to the benthic invertebrates than they are to the piscivorous birds and mammals. However, as noted in the RI, those risks are caused by exceedances of literature screening levels, not site-specific studies. Also see the response to comment 44.
52	2-10	PHC	52) Section 2.4 discusses chemicals of potential concern (COPCs) and preliminary remediation goals (PRGs). At this stage in the investigation, site-specific cleanup standards should be calculated only for the risk drivers, or chemicals of concern (COCs). Since I have not seen the RI/RA report, it is unclear if this is just a nomenclature error or if the total list of COPCs still has not been refined down to the risk drivers.	The parameters listed in Section 2.4 are actually COCs, not COPCs. The text will be changed to indicate that and the RAP will be revised - removing reference to PRGs as cleanup goals and relating the removal action to removal of the brown/tan silty sand (the blue gray clay native soil is considered clean) and risk analysis based on the 2008 investigation and additional confirmation samples.
53	2-10	PHC	53) Since it appears from previous sections that some of the chemicals that PRGs were calculated for contributed risk to both the human health and ecological risk assessments, it would be helpful if this section discussed the basis for the PRGs. Although there are some notation given on Table 2-5, those notations are not completely defined and it is unclear at first glance if those values are based on protection of human health or the environment.	The RAP will be revised - removing reference to PRGs as cleanup goals and relating the removal action to removal of the brown/tan silty sand (the blue gray clay native soil is considered clean) and risk analysis based on the 2008 investigation and additional confirmation samples.
54	2-13	PHC	54) It's unclear what the advantage was to Tetra Tech duplicating an effort that was already performed by the Navy, and is included in an appendix to this RAP.	The Tetra Tech HHRA will be removed from the RAP
55	2-13	PHC	55) The text and Table 2-6 state that no updates were made to the screening levels from the previous assessment. However, this results in outdated sources (i.e., Region 9 PRGs) being used as screening criteria. It seems that if the information in Appendix G is going to be redone by TT, that the updated assessment should reflect the current state of the science and use screening levels that are publically available.	This section and the associated tables will be revised and will reference the NAVFAC RERA in Appendix C.
56	2-13	Barclift	56) I'm not sure what the benefit is of having 2 (TTNUS, PHC) risk calculation presented in this section and in Appendix G, esp. since the outcomes are not identical. Please rectify.	This section and the associated tables will be revised and will reference the NAVFAC RERA in Appendix C.
57	2-14	PHC	57) Editorial: The second and third paragraphs refer to, "The Navy and Marine Corp Public Health Center." Please change "Corp" to "Corps."	In Section 2-14, the word "Corp" will be changed to "Corps".

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58	3.1- 3.6 Tom Spriggs	58) Dewatering sediments. Water will be moved from the streambed to the dewatering pad. Will water collection be low just because the soils are sandy? It just means they will drain faster than peat, silts, or clay. The contractor will face the pore water, the water transferred by the excavator irregardless of the soil type, PLUS water used to clean rocks >3" in diameter. Consider rewording to reflect that the station needs to be ready to handle ALL water for testing and treatment. Consider adding a statement that upland soils will be handled separately and not mixed with sediments for dewatering.	It is anticipated that the water collection will be low because the sediment/soil is silty/sandy. Wording will be added to Sections 3.1 through 3.6 as appropriate to better describe the contractors need to be ready to handle all water for testing and treatment. A statement will be added that upland soils will be handled separately and not mixed with sediments for dewatering.
59	Table 2-5 PHC	59) The references for Illinois EPA 2000 and the "Urban Area PAH study" could not be found. As such, it is not possible to verify these values or to understand the endpoints that were considered in their development. We recommend providing a discussion in this report that gives the context for these values.	The reference will be changed to the Illinois EPA TACO regulations (35 IAC Part 742), Appendix A, Table H Concentrations of Polynuclear Aromatic Hydrocarbon Chemicals in Background Soils. Additional text will be added to discuss this part of the TACO regulation. The tables appearing in Section 2 have been updated to reflect comments recieved regarding the use of the aforementioned EPA regulation.
60	3-1 PHC	60) This section opens with the statement, " <i>The intent of this RAP is to remove sediment with PAH, PCB, pesticide, and metal concentrations greater than the PRGs identified in Table 2-5 from the North Branch Pettibone Creek portion of Site 17.</i> " However, according to information and tables presented in Section 2, the native sediment contains levels of some of these compounds in excess of the PRGs. It seems that the intent of the remedial action is to get to native sediment, rather than getting to native sediment that meets the PRGs. We recommend clearly and consistently reporting the intent of the remedial action throughout the document.	The RAP will be revised - removing reference to PRGs as cleanup goals and relating the removal action to removal of the brown/tan silty sand (the blue gray clay native soil is considered clean) and risk analysis based on the 2008 investigation and additioinal confirmation samples.
61	3-2 PHC	61) Editorial: The second bullet on this page states, "...unless exposed native stream bed is bed rock...". Change "bed rock" to "bedrock."	Referances to "Bed Rock" have been changes to Stream bed" throughout the Section 3.
62	3-3 PHC	62) Editorial: The second paragraph contains the following sentence, "Creek and tributary increments in which construction activates will occur will be isolated from the rest of the creek and tributary using potable dam and a filtration device." "Activates" should be "activities" and "potable" should be "portable."	The words "activates" will be changed to "activities" and "potable" will be changed to "portable" in Section 3.2.
63	3-2; 3-6; 3-8 Khoi Nguyen	63) Page 3-2 - The second bullet in Section 3.2.6 indicate that post removal samples will be taken by the Navy's representative; Sec. 3.2.3 indicates that such samples will be collected by Tetra Tech. Recommend revising text or provide a clarification to remove the inconsistency.	Post removal sampling will not be performed in lieu of visual confirmation of acceptable sediment removal. Section 3 will be updated to reflect this approach accordingly.
64	3-3 Khoi Nguyen	64) Sec. 3.2 - Ensure outlet protection for each outfall discharging to the stream is properly installed or restored.	In the future, the Navy may conduct a separate study related to the stormwater outfalls and the outlet protection. Additional text will be added to the RAP that recommends instatioin of energy dissipation structures be designed and installed at each outfall.
65	3-4 PHC	65) Editorial: The second sentence after the table reads, " <i>Man-make materials will be cleaned ...</i> " Man-make should be changed to "man-made."	Text will be added to Section 3.2.1 indicating that reuse of man-made materials will be prohibited and make will be changed to made.
66	3-6 Barclift	66) Section 3.2.3 Post Removal Sampling - clarification is needed to further describe the implementation of the remedy. The RERA (appendix G) clearly indicates that both human health risk and ecological risk will be greatly reduced if sediment in PBC is removed to the native sediment layer identified during the 2008 sampling. Assuming that native sediment is reached, then there would be no need to perform post removal sampling. Reaching native sediment should be the basis of implementation esp. considering the relatively lack of a specific identified Navy source. If the basis of implementation is to meet chemical levels, then it is likely that the overall depth and cost of the remedy will increase due to exceedances of chemicals levels already know to occur in the native sediment. the overall goal of this remedy shoud be risk reduction, not risk elimination.	Post removal sampling will not be performed in lieu of visual confirmation of acceptable sediment removal. Section 3 will be updated to reflect this approach accordingly.

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67	3-6	J. Wright	67) Section 3.2.3 Post Removal Sampling - In concert with the preceding comment and post-removal sampling/analysis, please remove any discussion of conducting an ecological risk assessment on these post-removal data. An ERA has already been performed and thus is extraneous for this project. Suggest a total rewriting of this section stating that since risk reduction (not risk elimination) is the goal, sediments will be removed based on visual parameters and not based on confirmation sampling.	See response to Comment 66 above.
68	3-11	Khoi Nguyen, Tom Spriggs	68) Secs. 3.3, Item 5 - Stream backfilling and seeding would follow post-removal sampling. Recommend scheduling the backfilling process upon receipt of post-removal sampling result ("clean" only) and consider possible needs for further remediation of the section should analytical results come back "impacted above RG" before moving into backfilling operations.	See response to Comment 66 above.
69	3-12 and 4-1	Khoi Nguyen	69) Sec. 3.4 - Recommend adding a procedure to prevent storm water pollution due to project work when inclement weather conditions occur.	Section 4.0 presents methodologies and practices to be implemented to control erosion and sedimentation resulting from construction activities including erosion control devices, inspection and maintenance practices, site restoration activities, and response procedures. Specifically, a system of sediment traps will be deployed at strategic locations within Pettibone Creek designed to reduce the impacts of intrusive activities.
70	Table 3-1	Khoi Nguyen	70) Recommend addition of a project timeline or duration schedule for planning purposes.	It is not possible at this point to complete a project schedule given uncertainties with funding availability and remedy selection.
71	Fig. 3-1	Khoi Nguyen	71) Provide legend for the triangular symbols associated with the stream footprint.	The triangle symbols on this figure have been removed.
72	Fig. 3-2	Khoi Nguyen	72) Recommend replacing "Exposed Stream Bed" associated with the bottom line on the stream cross section with "Stream Native Soil"; add a note associated with the 12-in vertical thickness indicating that this thickness varies depending on stream location and can exceed three feet. Scale is not appropriate on this figure.	The figure will be revised based on the comment
73	Fig. 3-3	Khoi Nguyen, Tom Spriggs	73) The note "Limit of Excavation (24" Min. within Limits of Stream)" is unclear. Specify whether 24" represents the vertical or horizontal distance or both. Geotextile is shown under sand & gravel, what will keep either material & the geotextile in place during high flow? What is the purpose of this geotext material? Won't it float up during high flows? Scale is not appropriate on this figure.	The figure will be revised taking into consideration the comments and the restoration described in Section 6
74	5-1	Barclift	74) Section 5.2 Post removal sampling - it is stated that Post removal samples will be analyzed for PCBs. PCBs are not a risk driver for PBC. They are a risk driver for Boat Basin. Please remove. Also, please refer to the RERA in Appendix G that already presents an analysis of native sediment concentrations compared to the PRGs. This comparison and the results of the RERA should eliminate the need for post removal sampling. The remedy should be depth-based and not chemical based as it has already been determined that exceedances of chemical levels exist in native sediment.	Post removal sampling will not be performed in lieu of visual confirmation of acceptable sediment removal.
75	Fig. 4-2	Khoi Nguyen	75) Synthetic Filter Fence detail drawing - Recommend specifying the spacing between adjacent posts. A center-to-center spacing much shorter than 10 ft. would be needed on steep slopes such as those found at site.	A note will be added to the Synthetic Filter Fence detail to indicate a shorter post to post distance on steep slopes.
76	6-1	J. Wright	76) Title of section and first sentence is misleading and should be changed...this action is Site Restoration following a remedial action, not a supplemental remedial action. Suggest changing this term throughout the section and document, where applicable.	The title of Section 6 will be changed to "Pettibone Creek Stream Restoration Activities".

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77	6-1	Khoi Nguyen	77) Sacs. 6-1 and 6.2 - Figures 6-1 and 6-2 are not found. Reference(s) to Table 6-1 in the Sections needed.	Figures 6.1 and 6.2 will be included within Section 6 in the next submittal. A reference to Table 6-1 will be added to the text of Section 6. Note that the figures were provided electronically after the revised draft was submitted.
78	6-2	Tom Spriggs	78) Proper identification and reference for LUNKERS needs to be noted. Per the WI DNR website (http://dnr.wi.gov/news/WeeklyNews_Print.asp?id=1752), LUNKERS, which stand for Little Underwater Neighborhood Keepers Encompassing Rheotaxic Salmonids (check your spelling), were originally designed by recently retired WI DNR biologist Dave Vetrano for the protection of trout fingerlings.	The word Neighbor will be changed to Neighborhood in Section 6.2.
79	6-4	Tom Spriggs	79) The proposed use of Rootwads in this high energy, high flow environment should be thoroughly examined before we proceed. The use of natural material in this manner sounds good, but even the developers of the system caution users, see App. M, p.9-10 "Applicability & Limitations." Have we examined the possible outcomes of some becoming dislodged and moving downstream? Under extreme events, some could wash into the Boat Basin or beyond.	The addition of rock riffles into the proposed stream bank stabilization design will help alleviate high energies and will be included in the RAP submittal.
80	6-9	J. Wright	80) Section 6.5.7 - Please update the plant list to the revised list dated Aug 2011 (see attached). This list incorporates Bob V's comments to add species that are shade tolerant, as well as some suggested seeding rates. Within the RAP, suggest making this plant list it's own section as it includes species outside the Engineered Wetlands, such as the upland embankments.	The recommended plant list in the draft final RAP will be updated based on the plant list provided with the Navy comments (file that accompanied the comments).
81	Table 6-1	Khoi Nguyen	81) Fig. 6-9 referenced in the table is not found.	The reference was a typographical error and will be removed from the table.
82	App. I and App. K	Khoi Nguyen	82) Discuss the discrepancy in the estimated 100-yr flow rate (Q) associated with the North 2 stream section shown in Appendix J (341 cfs) and that associated with Drainage Area 1 (683 cfs). Provide updated flow profiles and stream cross section if the flow rate is higher than 341 cfs.	The storm flow calculations have been revised to include the correct contributing watershed basin and are included in Appendix K.
83	App. J	Khoi Nguyen	83) Fig. 1 - Specify locations of Junctions 1 and 2 (listed in the appendix) on the figure. Clarify if these junctions are the same as those shown in the first drawing found in Appendix I.	Additional Figures have been provided that provide a more clear representation of the cross sectioning evaluated.
84	App. K	Khoi Nguyen	84) Most of the estimated velocities of the post-construction flows exceed the maximum recommended flow velocity of 3 feet per second for silty sand soil above which silt transport is potentially promoted. Recommend an evaluation of the erosion potential with regards to the flow velocities, backfill materials, and proposed stream bank enhancement features.	Flow velocities will be considered with respect to backfill materials and stream bank enhancement features. Also see the response to Comment 82.
85	Drawing C-1	Khoi Nguyen	85) Is a J-hook needed for Wetland C? Is the use of lunkers suitable for this stream, where the main objective is to reduce erosion rather than creating a fish habitat? Root-wads cause turbulence, which may affect erosion. Provide a discussion on reasons for the selection of the proposed stream remediation features for each location (especially Ertec structures, log vanes, wetlands, lunkers, root-wads). Also, technical limitations and long-term maintenance aspects of the proposed features should be discussed.	Discussions and guidance will be added about the use of J-Hooks, LUNKERS, and Rootwads with regard to their applicability, technical limitations, and long-term maintenance.
86	Drawing C-1, C-2 & C-3	J. Wright	86) Please update the plant lists on the drawings... see attached revised list (8/2011). This list incorporates species that tolerate shade, as per Bob V's comments.	The updated plant list will be included in Section 6.
87	Drawings C-4 thru C-7	J. Wright	87) Please add cross sections detailing plant species location based on elevation and wetness. Since this project is in a remedial design phase, planting schemes for site restoration following a remedial action are usually included within remedial designs.	The reference to "Side Channel Wetlands" have been replaced with the more appropriate term, "Flood Plains" given the intent of these features. A general cross section detailing the plant species locations will be added to Drawing C-7.

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88	Dwg C-1 & 3 Tom Spriggs	88) Concerned with the design of all near-stream wetlands, A-C. At the upstream connection point, the end of the berm would sit exposed to erosion and damage at high flow conditions. Why are the wetland bottoms sitting 2-3 ft. above the stream elevation? What will keep the wetland plants saturated? My experience is to incorporate wetlands inline with the stream to capture and treat low flows using the plants and wetland shape and design a bypass structure for high flows. With energy dissipation structures upstream, the wetlands should survive high flows.	See the response to Comment 87 above with regard to the change in nomenclature. With respect to questions regarding plant saturation, the intent of the side channel flood plain is to provide areas to slow the flow during large storm events, not for treatment. As far as installing the flood plains inline, certain geographical limitations such as the existing access road limit the area where they could be installed.
89	Dwg C-6 Tom Spriggs	89) Section A-A is backwards. The berm should be shown on the left, not the right. Is this drawing illustrating Wetland A or Wetland C? What I meant to say, all wetland drawings say "Wetland A" inside the wetland drawing despite what the figure title says.	The drawings and wetland cross sections will be reviewed and corrected.
90	Dwg C-7 Tom Spriggs	90)The LUNKER sketch does not illustrate the open nature of the device underwater. Suggest referencing the WI DNR website above to improve the sketch, possibly incorporating a plan view or cross-section to illustrate the supports.	A more detailed LUNKER detail will be provided upon determining that the stream restoration activities will be performed as a result of the proposed additional sediment sampling and subsequent risk analysis.
91	Dwg C-7 Tom Spriggs	91) Suggest referencing this article for the design and use of these structures: " <i>The Cross-Vane, W-Weir and J-Hook Vane Structures...Their Description, Design and Application for Stream Stabilization and River Restoration</i> " D. L. Rosgen, P.H.	The suggested article will be referenced in Section 6 and will be added as an appendix.
92	App. E, p.6-10 Tom Spriggs	92) Is Tetra Tech proposing to use an asphalt emulsion to secure the temporary mulch in the floodplain as illustrated in the figure and first bullet? Do you have more contemporary specs other than MAR 1982?	An update version of the Erosion and Sediment Controls Standards is not available. Asphalt emulsion will not be used and will be crossed out.
93	See comment 6-9 J. Wright	93) Updated the plant list provided	The updated plant list will be included in Section 6.