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LETTER AND ATTACHED U S NAVY RESPONSE TO THE U S EPA REGION III SECOND ROUND COMMENTS ON THE DRAFT SAMPLING AND ANALYSIS PLAN FOR SITE 4 REMEDIAL INVESTIGATION WILLIAMSBURG FISC VA
9/7/2012
CH2M HILL

From:	Sawyer, Stephanie/VBO
To:	Haug.Susanne@epamail.epa.gov
Cc:	Park, Scott R CIV NAVFAC MIDLANT, EV; Smith, Wade (DEQ); Ivester, Marlene/VBO; Sawyer, Stephanie/VBO
Subject:	Response to EPA"s Second Round Comments on the Draft Site 4 RI UFP-SAP
Date:	Friday, September 07, 2012 1:20:14 PM
Attachments:	image001.jpg Site 4 Responses to EPA Round 2 Comment August 2012.pdf
Importance:	High

Sue,

Attached are the Navy's responses to the EPA's second round comments on the Draft Site 4 RI UFP-SAP. The USEPA comments were received via email on August 1, 2012. We will be discussing these RTCs at our partnering meeting next week so we can get consensus on the responses and mobilize to the field at the beginning of October.

I'll send the redline draft final version of the SAP in a separate email. If you have any questions prior to the meeting please let us know.

Thanks,
Stephanie

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Response to Comments
Tier II Sampling and Analysis Plan
Site 4 – Remedial Investigation
Naval Weapons Station Yorktown Cheatham Annex
Williamsburg, VA
September 7, 2012

EPA Tox Comment 2: EPA supports using a 95th percent Upper Tolerance Limit (UTL) to represent the upper end of background. This is not a conservative approach for estimating background conditions, at all; in fact, the 95th percent UTL allows for a great deal of leniency in defining background. At this site, where an on-site concentration exceeds the 95th percent UTL of the background dataset, the Navy proposes to default to the maximum background concentration as the comparison value. This type of point comparison alone simply is not good science. [RPM note: I also forwarded this comment/response to our statistician. If there are any changes or additions to this comment I will let you know within 1 week.]

Response: As discussed with the team on August 21, 2012, the intention of the Decision Tree (Figure 4) presented in the SAP is that comparison of COPC/COC concentrations to background 95% UTL data (or any other background-related criteria) will be conducted independently of the evaluation of potential risk through the completion of the human health and ecological risk assessments. Only in cases where potential human health or ecological risk is identified *and* comparison of site data to the background 95% UTLs indicates UTL exceedances, would further evaluation of the data with respect to consistency with background conditions be considered. In other words, should further evaluation methods (such as evaluating the magnitude of the 95% UTL exceedance and/or comparing to maximum background concentrations) be employed, they would only be utilized following the completion of the risk assessments. Therefore, the final step in the decision logic (Section 2.3.2, last bullet under "Human Health Decision Logic") was revised to state:

- If the COC concentrations exceed the background 95 percent UTLs, further evaluation will be conducted to consider whether the COC concentrations are consistent with background conditions or if they represent a release such that further action is warranted.

And the 2nd to last box in the decision logic (Figure 4) was revised to state:

> Conduct further evaluation to consider whether the COC concentrations are consistent with background conditions or if they represent a release such that further action is warranted. In addition, the text label for the arrow from this box directed to the left will be revised to read "COC concentrations not indicative of a CERCLA-related release" and the arrow directed to the right to read "COC concentrations indicative of a CERCLA-related release."

EPA RPM Comment 1: The response indicates that Appendix B was added to the SAP and includes figures showing soil, groundwater, sediment, and surface water exceedances. It would be helpful if these figures also showed all sample locations within each of these media so we can see the distribution of samples.

Response: There was a typo in the June 26, 2012 response to comment document. The response should have read as follows:

> Figures showing the exceedance of the screening criteria at Site 4 were included in the Site 4, Site 9, and AOC 3 Site Inspection Report. Since a single figure showing all SI exceedances of screening criteria and previous sampling locations would be extremely difficult to interpret due to the number of sampling locations and volume of results, Appendix B was added to the SAP and includes figures showing all soil, groundwater, sediment, and surface water ~~exceedances~~ sample locations and those constituents that exceeded their respective screening criteria.

EPA RPM Comment 2: The response is vague. It states that "the SAP was revised to include discussion of this agreement in an Action Items and Results section of the November 2011 Scoping Session". Was just the discussion documented in the SAP or will the number be revised to 50 ppb?

Response:

As a result of the original EPA RPM Comment 2 (dated June 13, 2012), in order clarify that 50 ppb will be used as the pesticide threshold (as opposed to what was originally discussed by the team during the Site 4 scoping sessions) the following text was added to the November 2011 scoping session summary:

> **Action Items and Results**
>
> The Team will discuss a threshold level for pesticides when determining if detected pesticides are as a result of normal base operations. *Follow-up: The Team agreed during the November 16, 2011 Partnering Meeting to use the threshold of 50 ppb when making risk management decisions on pesticides (i.e., pesticide detections of 50 ppb or below could be attributable to basewide pesticide use and not attributable to a CERCLA-related release).*

EPA RPM Comment 5: Based on results shown in the 2001 Pond Study, Jones Mill Pond and Cheatham Pond indicate COPCs. Because these ponds have received contaminants, they cannot be used as reference ponds.

Response: It is the Navy's position that the Pond Study sediment data do not preclude the use of Cheatham or Jones Pond as potential reference areas, particularly since the Pond Study sampling was biased toward portions of the ponds nearest to known source areas (sites); there are large, un-sampled areas within the ponds that are not near any known Navy source areas. However, based on further evaluation of the physical characteristics of the two proposed ponds, Cheatham Pond is the preferred choice for the reference area since it is more likely to provide areas with similar habitats for all of the surface water/sediment site evaluations (Site 4, Youth Pond, and Penniman Lake). Thus, Jones Pond has been removed from the SAP as a potential reference site. The results of the 2000 Pond Study indicate that very few organic constituents were detected in Cheatham Pond sediments (eight samples); a comparison of detected organic constituent concentrations with ecological sediment screening values indicate that none of the existing screening values were exceeded (see attached table). While several detected metals (e.g., arsenic, barium, and iron) exceeded ecological sediment screening values in one or more samples, the relatively small range in the detected concentrations do not suggest that they are the result of a release.

The Navy proposes that the suitability of Cheatham Pond as a reference area be evaluated as follows: (1) the site reconnaissance surveys at Site 4 (Upstream Pond), as well as at Youth Pond and Penniman Lake, will be conducted at the beginning of the sampling field event to characterize the physical characteristics of each water body; (2) a reconnaissance survey of Cheatham Pond will then be conducted to find specific areas that match, as closely as possible, the physical properties of each site water body (e.g., water depth, substrate type); (3) surface water and sediment samples will then be collected at the identified areas within Cheatham Pond and submitted for chemical analysis on a quick-turn basis; (4) while media and biological sampling of site water bodies is occurring, the unvalidated surface water and sediment data from Cheatham Pond will be reviewed (following a qualitative evaluation by a CH2M HILL chemist for critical quality issues) to determine if the sampling results preclude any of the identified areas in Cheatham Pond from being used for reference purposes following a similar process as used for the Pond Study data (see above); the Pond Study data will also be utilized as warranted during this process, which will be coordinated with the Partnering Team and technical support; and (5) biological data (tissue, invertebrates, and/or toxicity test samples) will be collected from the identified areas within Cheatham Pond that are deemed suitable. This approach was discussed during the August 21, 2012 Partnering Team and technical support conference call, with agreement by all participating parties. Thus, this approach has been added to Section 3.2.12 of the SAP.

EPA RPM Comment 7: I don't understand the use of reference pond data and how it relates to Site 4. Why would finding high levels chemical constituents (e.g., PCB's, explosives) in the reference pond change the conclusions drawn from Site 4 results? These are not naturally occurring substances.

Response: The purposes of the reference site samples are to provide background concentrations for naturally occurring constituents (such as metals) and widely occurring anthropogenic constituents with a multitude of sources (e.g., PAHs and certain pesticides), and to provide comparative data for site-specific biological surveys and toxicity testing. Significant detections of constituents such as PCBs and explosives within a reference area would preclude the use of that area as a suitable reference site. This information has been added to Section 2.3.4 of the SAP for clarity.

EPA RPM Comment 8: See Tox Comment 2.

Response: Please see the response to EPA Tox Comment 2 above.

EPA BTAG Comment 2: The response indicates that one additional surface and subsurface sediment sample is needed to determine if site related contaminants from Site 4 are migrating into Youth Pond. Without an understanding of the spatial variability of sediment concentrations in Youth Pond, one sediment sample is insufficient to make this determination. Either additional samples should be collected as part of this investigation or the investigation of this pathway should be deferred to the study of Youth Pond.

Response: As discussed and agreed to by the CAX Partnering Team, with input from their respective technical support during the August 21, 2012 conference call, these Youth Pond samples will be removed from the Site 4 SAP and included in the Youth Pond investigation SAP.

EPA BTAG Comment 3: The response indicates the lateral extent of the buried debris required further delineation and the team agreed that two test pits across the pond would address this data gap. The report does not indicate that the debris on the south side of the Upstream Pond would be the same as the debris that has been identified on the north side of the Upstream Pond. The Upstream Pond is not being sampled for debris. Again, the two debris test pits on the south side of this pond will not definitively address the existence of debris, or not.

Response: The lateral extent of buried debris within Burial Area 1 is the only area that requires further delineation; the extent of buried debris within Burial Area 2 has been delineated (see attached figure). During the 2009 SI test pitting activities, only the southeastern and eastern boundaries of Burial Area 1 could not be delineated due to the close proximity of Upstream Pond. Based on historical aerial photographs presented in the EPIC, it is not likely that buried debris extends beneath the pond such that it would be found on the southeastern or eastern side of Upstream Pond. While the potential exists for buried debris to be located in Upstream Pond, logistically, it is not possible to confirm its absence or presence within the pond. It is because of these reasons, that only two test pits are being proposed on the other side of the pond to identify the worst case scenario. In addition, as stated in the SAP, if buried debris is found in either of these two test pits, additional test pits will be excavated to determine the full extent of the debris.

EPA BTAG Comment 6: The response indicates "…the Navy technical folks feel two soil samples for hexavalent chromium are sufficient and that no groundwater samples are needed unless there is a known source." Support for this is needed to justify the decision reached. Section 2.1.3 appears to be related to human health only. Chromium can also impact ecological receptors. It is not clear that these two samples for hexavalent chromium would be adequate to assess ecological risk. In addition, if groundwater discharges to surface water (e.g., into the Upstream Pond, Youth Pond, or the York River) then multiple forms of chromium that would/could adversely impact ecological receptors need to be included in the analysis.

Response: The referenced quote at the beginning of the comment is a *summary* of the scoping session held by the Partnering Team. No other discussions regarding justification of the Navy's stance on hexavalent chromium sampling occurred at this time; therefore, no changes were made to Section 2.1.3.

The EPA is correct that the discussion summarized in Section 2.1.3 was related to human health only because the Partnering Team's hexavalent chromium analysis discussion was directly related to refining the human health risk assessment. The analysis of hexavalent chromium (along with total chromium) was included in this SAP specifically in order to refine the human health risk assessment. In accordance with EPA Policy, all detected

chromium must be assumed to be hexavalent chromium (the most toxic form) unless proven otherwise. It is for this reason alone that hexavalent chromium data are being collected.

Discussions regarding using hexavalent chromium analysis in the ecological risk assessment were not held (during the referenced scoping session or any other scoping session); therefore, information regarding using hexavalent chromium in the ecological risk assessment was not added to this section. It is understood that chromium (and all other constituents) can also pose potential risk to ecological receptors; however, the results of all other sampling proposed in this SAP will be used to determine which constituents pose potential risk to these receptors. Total chromium data (which will be collected in samples of all media) are typically sufficient for conducting an ERA. No changes were made to the SAP.

EPA BTAG Comment 9: The response states "…maximum HQ exceeds one…." This needs to change to "…maximum HQ is equal to or exceeds one…." It is not clear that this response can be applied to invertebrates and plants because the maximum HQ and the mean HQ will be used to describe the range of risk for these ecological receptors. Also, because contaminant concentrations in soil can be highly variable, using frequency of detection, frequency of exceedance, as well as spatial distribution of exceedances may not be a good indicator of the spatial extent of the ecological risk. The uncertainty of using these variables will need to be adequately addressed in the report given the potential for concentrations to be spatially variable (e.g., site related contamination not uniformly distributed). BTAG does not support the unqualified use of the magnitude of the HQ exceedance as an indicator of risk.

<u>Response:</u> The requested change in the first sentence of this comment was made to the relevant bullets in Section 2.3.2 of the SAP. The factors listed in the original response to this comment (submitted June 26, 2012) will be used as lines of evidence to determine if specific constituents warrant retention as COPCs for particular media. The uncertainties will be discussed in the ERA portion of the RI report. This information has also been added to Section 2.3.2.

EPA BTAG Comment 14: The response states that one surface and subsurface sediment sample will be used to determine if and what site related contaminants are migrating from Site 4 into Youth Pond. Making this determination based upon a single sample is highly questionable and uncertain. Currents within Youth Pond, resulting from groundwater discharge and storms, can redistribute contaminants which will not be identified by a single sample. Finally, no meaningful statistics can be applied to a single sample.

<u>Response:</u> Please see the response to EPA BTAG Comment 2.

EPA BTAG Comment 16: The response indicates the use of a single test organism (Hyalella azteca) is appropriate. The uncertainty of using one species to assess toxicity to invertebrates should be addressed in the report.

<u>Response:</u> The uncertainties will be discussed in the ERA portion of the RI report.

EPA BTAG Comment 17: The response indicates that the top two feet of soil is the standard depth of invertebrates that has been established for CAX. A number of previous comments have been made asking for support for this depth range as appropriate, but no adequate responses have been provided that pertain to the biology/habits of soil invertebrates. The question/concern is still valid and needs to be addressed in this report.

<u>Response:</u> This depth range was originally selected at the request of BTAG to conform to their previous FAQ guidance. A TEARS issue paper issued at about the same time (May 2003) concluded the following: "…a sampling depth of 0 to 12 inches (0 to 30 cm) should capture the bulk of critical ecological exposure point concentrations for most receptors, with some plant, invertebrate, and vertebrate receptors requiring additional sampling at depths of 12 to 24 inches (30 to 61 cm)." In addition, this comment was discussed during the August 21, 2012 Partnering Team and technical support conference call, and the participating parties agreed sampling the top two feet for evaluation of ecological risk is acceptable. While there are situations where the soil horizons with biological activity may extend beyond two feet deep, this situation can, and will, be addressed as part of the uncertainty section of the ERA in the RI report. No changes were made to the SAP.

EPA BTAG Comment 19: The comment indicated that background data from the same soil types found at Site 4 will need to be used. The response was "Comment noted." This response needs to confirm that background soil data from the same soil types that are at Site 4 will be used.

Response: The CAX Background data set for soil is based on depth (surface vs. subsurface) not soil lithology. As with the Site 4 SI, all surface soil evaluated in the Site 4 RI will be compared to the surface soil background dataset. Likewise, all subsurface soil will be compared so the subsurface soil background data set. Since the groundwater at Site 4 is the Yorktown-Eastover aquifer, all groundwater will be compared to the Yorktown-Eastover background dataset. Section 2.3.4 was revised to include this information.

EPA BTAG Additional comments on Figure 5:

a. It is not clear why the complete Burial Area 1 is not contained within the Burial Investigation Area 1. In both Burial Investigation Areas, there are areas included which are outside of the two identified Burial Areas. The text needs to adequately explain why there are no samples in these areas.

b. The SAP needs to clearly document why the sample locations proposed on this figure were selected. There appears to be a large amount of area in the burial areas where sampling will not occur, and the rationale for this needs to be provided.

Responses:

a. As described in the SAP, Burial Investigation Areas 1 and 2, shown on Figure 5 with yellow lines, are the previous study area boundaries for AOC 3 and Site 4, respectively, thus they represent previous, not current, conditions. Based on the SI, the Partnering Team agreed to incorporate AOC 3 into Site 4 for one large study area (shown on Figure 5 with a turquoise line). Burial Area 1 and Burial Area 2 represent the results of the 2009 SI test pitting activities, which revealed two distinct buried debris areas. The attached figure depicts all of the SI sample locations, as well as the proposed RI sample locations. Based on the results of the SI, the proposed RI sample locations cover data gaps, and there is adequate coverage within these areas. The Partnering Team agreed this sample density was adequate and no additional sampling within these areas was needed. In addition, the data evaluated in the 2009 SI will also be evaluated in this RI. The proposed sampling rationale is presented in Table 2-12 of the SAP.

b. The proposed sampling locations and laboratory analyses for the Site 4 RI were selected because the CAX Partnering Team (with consultation from their respective technical support) agreed that these sampling locations, combined with those evaluated in the 2009 SI, would fulfill the objectives of the RI (i.e., to adequately characterize Site 4 and evaluate the potential risk to human health and ecological receptors). Regarding the absence of samples within the burial areas, please refer to the response above.

Table 1
Exceedances - Cheatham Pond Surface Sediment - Pond Study
Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia

Station ID	**Sediment ESV**	Cheatham Pond-SD02		Cheatham Pond-SD03	Cheatham Pond-SD04	Cheatham Pond-SD05	Cheatham Pond-SD06	Cheatham Pond-SD07	Cheatham Pond-SD18	Cheatham Pond-SD19
Sample ID		CP-00-POND-SD02-0300	CP-00-POND-SD02D-0300	CP-00-POND-SD03-0300	CP-00-POND-SD04-0300	CP-00-POND-SD05-0300	CP-00-POND-SD06-0300	CP-00-POND-SD07-0300	CP-00-POND-SD18-0300	CP-00-POND-SD19-0300
Sample Date		03/30/00	03/30/00	03/30/00	03/30/00	03/31/00	03/31/00	03/31/00	03/30/00	03/30/00
Volatile Organic Compounds (UG/KG)										
Acetone	NSV	210 B	110 U	310 B	180 B	65 U	**780**	**1,500**	320 B	540 B
Toluene	4,194	110 U	110 U	85 U	**11 J**	65 U	79 U	**32 J**	82 U	60 U
Semivolatile Organic Compounds (UG/KG)										
bis(2-Ethylhexyl)phthalate	750	220 B	3,600 U	**260 J**	2,600 U	120 B	2,600 U	180 B	2,700 U	2,000 U
Diethylphthalate	630	3,600 U	3,600 U	2,900 U	**370 J**	2,100 U	2,600 U	2,900 U	2,700 U	2,000 U
Nitrobenzene	11,137	3,600 U	3,600 U	2,900 U	2,600 U	2,100 U	2,600 U	**69 J**	2,700 U	2,000 U
Pesticide/Polychlorinated Biphenyls (UG/KG)										
No Detections	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Herbicides (UG/KG)										
Diquat	NSV	NA	NA	NA	NA	NA	NA	NA	**110,000**	**48,000**
Explosives (UG/KG)										
4-Amino-2,6-dinitrotoluene	145	250 UJ	250 UJ	250 UJ	250 UJ	250 UJ	250 UJ	250 UJ	**96 J**	250 UJ
Inorganics (MG/KG)										
Aluminum	25,500	**8,710**	**9,400**	**10,100**	**12,400**	**10,900**	**12,200**	**7,990**	**10,300**	**4,880**
Arsenic	9.79	**63.6**	**65.3**	**75.2**	**58.5**	**50.3**	**45.4**	**51.1**	**61.6**	**36.5**
Barium	20	**59**	**56.9**	**69.9**	**61.8**	**67.8**	**66**	**57.6**	**56.7**	**46.2**
Beryllium	NSV	**1.2**	1.15 U	**0.53**	0.851 U	**0.4**	**0.54**	**0.29**	**1.2**	**1.1**
Calcium	--	**177,000**	**172,000**	**65,700**	**79,600**	**180,000**	**66,700**	**150,000**	**128,000**	**189,000**
Chromium	43.4	**22.9**	**31.3**	**25.7**	**38**	**21.2**	**26.5**	**17.2**	**29.1**	**9**
Cobalt	50	**8**	**12.7**	**4.5**	**9.4**	**2.7**	**3.8**	**3.4**	**6.3**	**5.4**
Copper	31.6	**19.5**	**19.1**	**15.6**	**20.2**	**11.6**	**13.3**	**12.5**	**20.8**	**10**
Iron	20,000	**24,100**	**23,800**	**35,800**	**32,800**	**20,300**	**28,600**	**16,300**	**22,600**	**11,000**
Lead	35.8	**27**	**27.4**	**31.3**	**29.6**	**23.6**	**29.1**	**26.2**	**29.2**	**13.8**
Magnesium	--	**1,660**	**1,780**	**2,300**	**2,650**	**2,340**	**1,950**	**1,730**	**2,110**	**1,450**
Manganese	460	**221**	**222**	**300**	**292**	**186**	**179**	**129**	**244**	**141**
Mercury	0.18	**0.15**	**0.13**	**0.18**	**0.18**	**0.12**	**0.17**	**0.13**	**0.24**	**0.08**
Nickel	22.7	22.2 U	24.4 U	**13.2**	18.1 U	**9.5**	**10.3**	**7.1**	16.3 U	11.7 U
Potassium	--	**1,600**	**2,090**	**2,080**	**2,440**	**1,510**	**1,870**	**1,490**	**1,670**	**1,020**
Sodium	--	**308**	**329**	**343**	**349**	**344**	**344**	**341**	**519**	**212**
Thallium	NSV	5.90 U	6.72 U	5.61 U	**6.5**	4.02 U	4.95 U	5.34 U	4.51 U	3.23 U
Vanadium	57	**27**	**33**	**36.9**	**41.1**	**30.9**	**39.1**	**28.2**	**35.2**	**17.5**
Zinc	121	**76.9**	**79.2**	**77.1**	**91.1**	**51.4**	**58.3**	**45.6**	**61.1**	**30.4**
Other Parameters (various units)										
pH (PH)	--	**7.6**	**7.7**	**8**	**7.8**	**7.7**	**7.9**	**7.3**	**7.7**	**7.8**
Total organic carbon (TOC) (MG/KG)	--	**43,200**	**60,800**	**108,000**	**29,500**	**46,700**	**78,300**	**12,700**	**96,500**	**68,500**

Notes:

Grey highlighting indicates value greater than screening value

Yellow highlighting indicates value equal to screening value

Bold indicates detections

NA - Not analyzed

B - Analyte not detected above the level reported in blanks

BJ

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

PH - pH units

UG/KG - Micrograms per kilogram

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Legend

- Outfall
- Storm Water Line
- Culvert
- Drainage Channels
- Proposed Test Pit Locations
- Burial Investigation Areas
- Water Body
- Site 4 Boundary
- Burial Area Boundary
- Inferred Boundary of Burial Area

N
W E
S

0 30 60
Feet

Burial Area Map
Cheatham Annex
Williamsburg, Virginia

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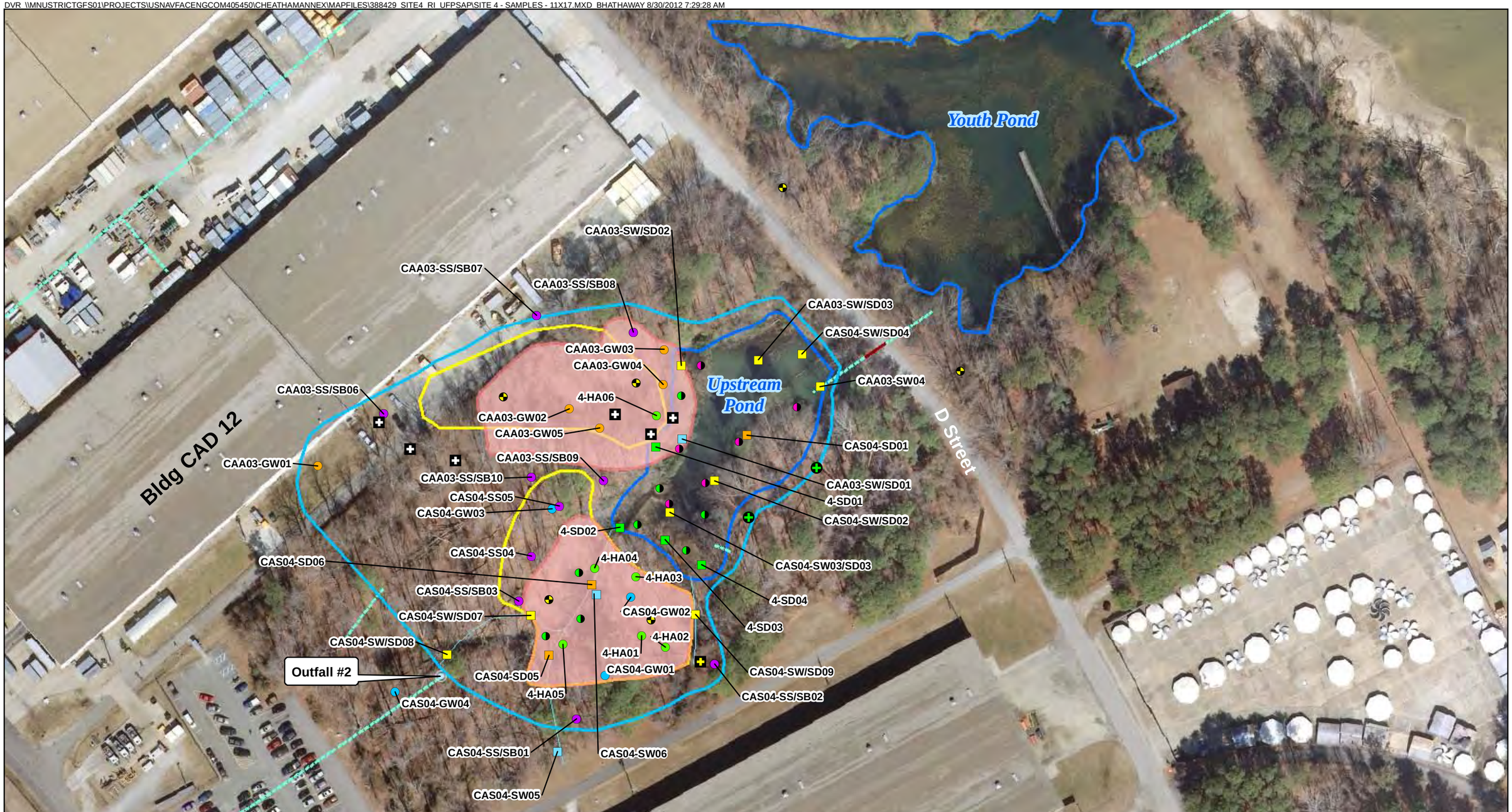
DVR \\MNUSTRICTGFS01\PROJECTS\USNAVFACENGCOM405450\CHEATHAMANNEX\MAPFILES\388429_SITE4_RI_UFPSAP\SITE 4 - SAMPLES - 11X17.MXD BHATHAWAY 8/30/2012 7:29:28 AM



Legend

- Proposed Surface Soil Samples
- Proposed Groundwater Sample Location
- Proposed Surface Soil Samples for Hexavalent/Total Chromium
- Proposed Surface/Subsurface Soil Samples
- Proposed Surface Sediment Samples
- Proposed Sediment/Toxicity Samples
- 1999 Soil Sample
- 1999 Sediment Sample Location
- 2009 SI DPT Soil Sample/Well Point Groundwater Sample Location
- 2009 SI Soil Sample Location
- 2009 SI Well Point Groundwater Sample Location
- 2009 SI Surface Water Sample Location
- 2009 SI Sediment Sample Location
- 2009 SI Surface Water/Sediment Sample Location
- Site 4 Study Area
- Burial Areas
- Water Body
- Outfall
- Storm Water Line
- Culvert
- Drainage Channels

N
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0 50 100
Feet

Sample Locations
Cheatham Annex
Williamsburg, Virginia

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