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March 11, 2010

U.S. Environmental Protection Agency – Region II
290 Broadway – 22nd Floor
New York, NY 10007-1866

Attn: Mr. Timothy Gordon

Re: Contract N62470-07-D-0502
IQC for A/E Services for Multi-Media
Environmental Compliance Engineering Support
Delivery Order (DO) 0002
U.S. Naval Activity Puerto Rico (NAPR)
EPA I.D. No. PR2170027203
Draft Corrective Measures Study (CMS) Investigation for SWMU 61
Request for Additional Sampling

Dear Mr. Gordon:

In response to EPA comments dated February 18, 2010 on the January 8, 2010 proposal for additional sampling at SWMU 61 this proposal has been modified below. The headers on pages 2 through 9 were updated. Chloroform was added to the list of six VOCs detected in subsurface soil (3 to 11 ft bgs) and a proposed schedule for implementing this work is attached. Replacement pages are provided for this submission and directions for inserting these pages are attached for your use.

Michael Baker, Jr., Inc. (Baker), on behalf of the Navy, has completed the environmental sampling and laboratory analysis specified in the Final Corrective Measures Study Work Plan for SWMU 61 (December 6, 2007). A preliminary evaluation of the resulting data indicates that the extent of contamination in the surface soil, subsurface soil, sediment and groundwater has not been fully defined. In addition, completeness goals for VOCs in soil were not achieved due to data quality issues identified during validation activities. Additional sampling of these media is required to complete the field work requirements for a CMS and to identify the nature and extent of contamination requiring follow-on action. Field activities that have already been completed and the associated data, as well as the results from the proposed additional sampling will be fully documented and evaluated in the CMS Investigation Report for SWMU 61. This additional sampling and analysis will follow the approved sampling and analytical procedures in the Final Work Plan. The following paragraphs provide a brief summary of the field activities completed, the sampling results and the additional sampling proposed for this SWMU.

Field Activities

The field activities specified in the Final Work Plan for SWMU 61 (Former Bundy Area Maintenance Facilities) primarily consisted of:

- The collection of surface soil samples from 20 soil boring locations for laboratory analysis of Appendix IX volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs) (including low level polycyclic aromatic hydrocarbons [LLPAHs]) and metals.

- The collection of a total of 40 subsurface soil samples from 20 soil boring locations for laboratory analysis of Appendix IX VOCs, SVOCs (including LLPAHs) and metals.

- The installation of permanent monitoring wells at six of the 20 soil boring locations.

- The collection of groundwater samples from six monitoring wells for laboratory analysis of Appendix IX VOCs, SVOCs (including LLPAHs), and total and dissolved metals.

Sample locations are provided on Figure 1.

This field program was conducted in May and June 2008. During the development of the CMS Investigation Report sparsity of data from the adjacent freshwater wetland was identified as a data gap. Collection of sediment samples from nine locations and background sediment samples from an additional nine locations from the adjacent freshwater wetland was conducted in October 2008. Sediment sample locations are shown on Figure 2.

Analytical Results

Detected concentrations of VOCs, SVOCs (including LLPAHs) and metals for surface soil, shallow subsurface soil, subsurface soil, sediment and groundwater are provided on Tables 1 through 6. Data were preliminarily screened against various human health and ecological criteria to identify potential data gaps or areas requiring further delineation (additional risk-based evaluation of the data will be included in the CMS Investigation Report). Screening criteria for surface and subsurface soil included USEPA Regional Screening Levels (RSLs) for Residential and Industrial Soil, ecological screening values and Naval Activity Puerto Rico (NAPR) basewide background screening values; screening criteria for groundwater included RSLs for Tap Water, maximum contaminant levels (MCLs), ecological screening criteria for surface water and NAPR Basewide background screening values; screening criteria for sediment included RSLs for Residential and Industrial soil, selected ecological soil screening values and maximum constituent concentrations from the background freshwater sediment samples. A comparison of the detected concentrations to applicable screening criteria is provided on Tables 1 through 4 and Table 6. Complete analytical data, including third party data validation and certification by a Puerto Rican chemist is available on request and will be included in the CMS Investigation Report.

The following paragraphs provide a brief summary of the analytical results and identification of the constituents and areas requiring further delineation at SWMU 61.

Surface Soil

Detected compounds in the surface soil were compared to human health and ecological screening criteria and background as shown on Table 1.

Four VOCs were detected in surface soil (i.e., 2-hexanone, acetone, carbon disulfide, and iodomethane). However, none of the detections exceed screening criteria. Although screening criteria were not exceeded, additional evaluation of VOCs is recommended because the completeness goal (95 percent of all sample data) established in the Data Control Quality Assurance Plan (DCQAP) was not met. Specifically, non-detected results for four samples (61SB04-01, 61SB09-001, 61SB09-00D, and 61SB10-00) were rejected during data validation activities.

Twenty-two SVOCs were detected in the surface soil; of these 22 SVOCs, only five PAHs exceeded human health screening criteria: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene. The ecological screening criteria for low or high molecular weight PAHs were not exceeded. Figure 3 illustrates the distribution of benzo(a)pyrene in surface soil with isoconcentration lines corresponding to the RSLs for Residential and Industrial Soil. With the exception of 61SB05, the SVOC exceedances occurred in the southern portion of the site with the highest concentrations at 61SB01, 61SB07 and 61SB09. Although the concentrations are low, the lateral extent of PAH contamination in the surface soil in the southern portion of the site requires further delineation.

Sixteen metals were detected in the surface soil samples collected from SWMU 61 (see Table 1). Only five of the 16 detected metals exceeded either the human health or ecological screening criteria and background: arsenic, barium, copper, lead and zinc (see Figure 4). Arsenic was detected at each of the 20 surface soil sample locations and exceeded the RSL for Residential Soil at 20 locations, exceeded both the RSL for Residential and Industrial Soil at 15 locations and exceeded the RSL for Residential and Industrial Soil and background at five locations. The locations where both human health criteria and background were exceeded include 61SB05 and 62SB06 in the northern portion of the site, 61SB12 in the western portion of the site and 61SB04 and 61SB10 in the eastern portion of the site. The extent of contamination in each of these areas is not fully defined and requires the collection of additional samples. Barium exceeded both the ecological soil screening criteria and background at two locations, 61SB13 and 61SB20. The barium exceedance at 61SB13 appears to be delineated; however, the exceedance at 61SB20 requires further definition. Copper exceeded the ecological screening criteria at 14 locations; both the ecological screening criteria and the background screening value were exceeded at only one location, 61SB16. The copper exceedance is limited to this one location and does not require further delineation. Lead exceeded both the ecological screening value and the background screening value at one location, 61SB04 in the eastern portion of the site. The extent of lead contamination in this area requires further definition. Zinc exceeded both the ecological screening criteria and the background screening value at four locations: 61SB04 and 61SB10 in the eastern portion of the site, and 61SB08 and 61SB12 in the southwestern portion of the site. Each of these areas also requires further investigation with respect to the occurrence of zinc.

Based on the data collected for the CMS Investigation, the distribution of PAHs, arsenic, barium, lead and zinc in surface soil has not been fully defined and additional surface soil sampling is required to delineate the extent of these contaminants. In addition, data completeness goals for VOCs were not met due to data

quality issues identified during validation activities (non-detected results for approximately 30 percent of the surface soil samples were rejected). Therefore, additional surface soil sampling for this analyte class is required to meet project objectives for data completeness.

Shallow Subsurface Soil (1 to 3 ft bgs)

Detected compounds in the shallow subsurface soil (1 to 3 feet below ground surface [ft bgs]) were compared to human health and ecological screening criteria and background as shown on Table 2.

Four VOCs were detected in the shallow subsurface soil (2-hexanone, acetone, carbon disulfide, and iodomethane), with none of the detections exceeding screening criteria. Identical to surface soil, validation activities identified data quality issues that resulted in non-detected results for three shallow subsurface soil samples to be rejected (61SB03-01, 61SB09-01, and 61SB13-01). Because the completeness goal for VOCs was not achieved, additional evaluation of this analyte class is recommended.

Twenty-one SVOCs were detected in the shallow subsurface soil; of the 21 detected SVOCs, only five PAHs exceeded human health screening criteria at one location, 61SB09: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene. Ecological screening criteria for low or high molecular weight PAHs were not exceeded. Benzo(a)pyrene also exceeded screening criteria at two other locations, 61SB01 and 61SB08. Figure 5 illustrates the distribution of benzo(a)pyrene in shallow subsurface soil with isoconcentration lines corresponding to the RSL for Industrial and Residential Soil. This figure shows elevated concentrations of benzo(a)pyrene in the southwestern portion of the SWMU. Additional shallow subsurface soil sampling is required to delineate the lateral extent of this contamination.

Sixteen metals were detected in the shallow subsurface soil samples collected from SWMU 61; only three of the 16 detected metals exceeded either the human health or ecological screening criteria and background: arsenic, barium, and cobalt (see Table 2). Arsenic was detected at each of the 20 shallow subsurface soil sample locations and exceeded the RSL for Residential Soil at all 20 locations, and exceeded the RSL for Residential and Industrial Soil and background at 12 locations, as shown on Figure 6. Based on the available data, additional definition of the arsenic concentrations in the shallow subsurface soil is required around the perimeter of the site adjacent to 61SB01, 61SB04, 61SB05, 61SB08, 61SB12, 61SB15 and 61SB19. Note that the arsenic concentrations are relatively low and maybe more indicative of natural background variability rather than site contamination. Barium exceeded the ecological soil screening criteria and background at five locations: in the northern portion of the site in the vicinity of 61SB05 and 61SB18, in the west central portion of the site in the vicinity of 61SB11 and 61SB12 and in the southern of the site in the vicinity of 61SB07. Barium requires further delineation in each of these three areas. Cobalt exceeded background and ecological soil screening criteria at one location, 61SB11. The cobalt distribution appears to be delineated at this location.

Based on the data collected for the CMS Investigation, the extent of PAH, arsenic and barium contamination in the shallow subsurface soil has not been fully defined. Additional sampling, primarily around the perimeter of the SWMU is required to delineate this contamination. As discussed above, the detected arsenic concentrations may represent natural background variability rather than site contamination. Collection of additional samples will increase the power of statistical testing that may be

conducted on the data set to evaluate this situation. In addition to PAHs and metals, additional sampling is required to achieve data completeness goals for VOCs. As discussed above, non-detected VOC results for three shallow subsurface soil samples, representing 15 percent of the shallow subsurface soil samples, were rejected during data validation activities.

Subsurface Soil (3 to 11 ft bgs)

Detected compounds in the subsurface soil (greater than 3 ft bgs) were compared to human health and ecological screening criteria and background as shown on Table 3.

Six VOCs were detected in the subsurface soil (3-chloro-1-propene, acetone, carbon disulfide, chloroform, iodomethane, and trichloroethene). None of the detections exceed screening criteria. However, identical to surface and shallow subsurface soil, non-detected results for three samples (61SB13-05, 61SB14-05, and 61SB15-05) were rejected during data validation activities. As such, the data completeness goals for this analyte class were not met. Investigation of potential on-site sources of VOC contamination also is necessary in the vicinity of monitoring wells 61SB05 and 61SB06 and borings 61SB17 and 61SB18. Based on these considerations, additional sampling for VOCs is recommended.

Thirteen SVOCs were detected in the shallow subsurface soil. Of the 13 detected SVOCs, only one PAH, benzo(a)pyrene exceeded human health screening criteria at two locations, 61SB01 and 61SB07. As shown on Table 3, the benzo(a)pyrene concentrations at these two locations are relatively low. However, because of their co-location with surface and shallow subsurface soil PAH exceedances, the subsurface soil PAH exceedances represent a potential data gap with respect to the extent of contamination.

Fourteen metals were detected in the shallow subsurface soil samples collected from SWMU 61. Only three of the 14 detected metals exceeded either the human health or ecological screening criteria and background: arsenic, cobalt and vanadium (see Table 3). Arsenic was detected at 19 of the 20 subsurface soil sample locations (the arsenic data for one location was rejected by the data validator) and exceeded the RSL for Residential Soil at all 19 locations, and exceeded the RSL for Residential and Industrial Soil and background at 11 locations, as shown on Figure 7. Based on the available data, additional definition of the arsenic concentration in subsurface soil is required around the perimeter of the site adjacent to 61SB01, 61SB02, 61SB04, 61SB05, 61SB06, 61SB07, 61SB08, 61SB15 and 61SB20. Note that arsenic concentrations are relatively low and may be more indicative of natural background variability rather than site contamination. Cobalt exceeded background and the RSL for Residential Soil at seven locations; cobalt also exceeded background and the RSL for Industrial Soil at six of these locations, primarily in the northern portion of the site. Additional delineation of the cobalt contamination is required in the northern portion of the site around 61SB05, 61SB06, 61SB19 and 61SB20. Vanadium exceeded background and the RSL for Residential Soil at one location (61SB18) from a depth of 9 to 11 ft bgs. This represents a single exceedance at depth that does not require further delineation.

Based on the data collected for the CMS Investigation, the extent of PAH, arsenic and cobalt contamination in the subsurface soil has not been fully defined. Additional sampling, primarily around the perimeter of the SWMU is required to delineate this contamination; this will also increase the power of statistical testing that may be conducted on the data set to evaluate background verses site contamination. Additional sampling for VOCs also is required to achieve data completeness goals for this

analyte class (approximately 12 percent of the subsurface soil samples were rejected during data validation activities).

Sediment

Detected compounds in the freshwater sediment samples were compared to human health and ecological screening criteria as shown on Table 4. Nine background sediment samples were collected from the freshwater wetland as shown on Table 5. Although there is not a sufficient number of samples to calculate a Background Screening Value (mean plus two standard deviations), the sediment sample results were compared to the maximum detections in the background data set as an indicator of potential site contamination. A more complete evaluation of background will be provided in the CMS Report.

Two VOCs were detected in the sediment, although none of the detections exceeded screening criteria. Additional delineation is not required for this suite of constituents in the sediment.

Twelve SVOCs were detected in the sediment. Only two of the 12 detected SVOCs exceeded their respective screening criteria: 3 & 4 methylphenol and benzo(a)pyrene. 3 & 4 Methylphenol exceeded the ecological screening criteria; no human health criteria have been established for this compound. Benzo(a)pyrene exceeded the RSL for Residential Soil at six of the nine sediment sample locations, as shown on Table 4. The levels of the detected SVOCs are relatively low; however, any additional sediment samples that are collected from the wetland should include SVOCs to verify that the contamination is low level and delineated.

Fourteen metals were detected in the sediment samples collected from SWMU 61. Of the 14 detected metals, eight exceeded either the human health or ecological screening criteria and the maximum detected background concentrations: antimony, barium, cadmium, chromium, copper, lead, mercury and nickel (see Table 4). Antimony was detected at two sample locations (61SD08 and 61SD09) at a concentration in excess of the RSL for Residential Soil, the ecological soil screening value and the maximum detected background concentration. Barium and cadmium were detected at one sample location at concentrations in excess of both the ecological soil screening value and the maximum background concentration. Chromium was detected at seven sampling locations at a concentration in excess of the ecological screening criteria and the maximum background concentration. Copper was detected at six sampling locations at a concentration in excess of the ecological screening criteria and the maximum background concentration. Lead was detected at all nine sampling locations at a concentration in excess of the ecological screening criteria and the maximum background concentration. Mercury was detected at two sampling locations at a concentration in excess of the ecological screening criteria and the maximum background concentration. Nickel was detected at one sampling location at a concentration in excess of the ecological screening criteria and the maximum background concentration. The distribution of these metals, particularly lead, has not been defined in the freshwater sediment and additional sampling is required to fully delineate the extent of this contamination.

Based on the data collected for the CMS Investigation, the extent of PAH, antimony, barium, chromium, copper, lead, mercury and nickel contamination in the sediment has not been fully defined and additional sampling in the freshwater wetland is required.

Groundwater

Detected compounds in the groundwater were compared to human health and ecological screening criteria and background as shown on Table 6.

Four VOCs were detected in the groundwater samples; three of these VOCs were detected at concentrations in excess of screening criteria including chloroform, tetrachloroethene and trichloroethene (see Figure 9). Chloroform was detected in five of the six monitoring well samples at concentrations exceeding the RSL for Tap Water. Tetrachloroethene was detected at a concentration in excess of the RSL for Tap Water in the groundwater sample collected from 61SB06. Trichloroethene was detected at concentrations in excess of the RSL for Tap Water in the groundwater samples collected from 61SB05 and 61SB06. Trichloroethene was also detected at a concentration in excess of the MCL in the sample collected from 61SB05. This contamination is believed to be associated with SWMU 54 (located approximately 175 feet east-northeast of SWMU 61), although this has not been confirmed. Data from the adjacent SWMU 54 should be reviewed in conjunction with data from SWMU 61 to determine the potential source of this contamination. Installation of groundwater monitoring wells along the eastern border of SWMU 61 also may assist in determining the hydrogeologic connection between the two SWMUs.

One SVOC, bis(2-ethylhexyl) phthalate was detected in the groundwater samples collected from monitoring wells 61SB02 and 61SB04 at a concentration greater that the ecological groundwater screening value. This compound was detected at trace concentrations and is a typical laboratory artifact. No additional delineation is required.

Eight metals (arsenic, barium, chromium cobalt, copper, nickel, selenium and vanadium) were detected in the total recoverable fraction of the groundwater samples collected from SWMU 61. Although there were various exceedances of the RSLs for Tap Water and the ecological groundwater screening values, none of the detected concentrations exceeded background. No additional delineation is required.

Five metals (barium, cobalt, nickel, selenium and vanadium) were detected in the dissolved fraction of the groundwater samples collected from SWMU 61. Vanadium exceeded the RSL for Tap Water, the ecological groundwater screening value and the background screening value in samples collected from five of the six monitoring wells; vanadium did not exceed the RSL for Tap Water or background at 61SB01. Additional delineation of the distribution of dissolved vanadium in groundwater is required.

Based on the data collected for the CMS Investigation, the extent of VOC and vanadium contamination in the groundwater has not been fully defined. Additional sampling, primarily around the perimeter of the SWMU is required to delineate this contamination.

Additional Sampling

Additional sampling at SWMU 61 is proposed to further delineate contamination in the soil and groundwater in the upland area and in the sediment in the freshwater wetlands at SWMU 61. The procedures given in the Final Corrective Measures Study Work Plan for SWMU 61 will be followed to conduct this additional investigation. The following items outline the additional work proposed for SWMU 61 (refer to Figures 10 and 11 for sample locations):

- A total of 32 soil borings are proposed for installation to a depth of 12 feet below the ground surface. These borings will be installed primarily around the perimeter of the site, as shown on Figure 10 to further delineate surface, shallow subsurface and subsurface soil contamination. However, several borings will be installed in the vicinity of monitoring wells 61SB05 and 61SB06 and borings 61SB17 and 61SB18 to further investigate potential on-site sources. Note that the location of the borings may be adjusted in the field, as needed to allow for better characterization of potential migration pathways (i.e. topographic low areas or swales, etc.). Surface soil (0 to 1 ft bgs), shallow subsurface soil (1 to 3 ft bgs) and subsurface soil (9 to 11 ft bgd or to just above the groundwater table, unless field screening indicates a different interval as displaying contamination) samples will be collected from each boring. Each sample will be analyzed for Appendix IX VOCs, SVOCs (including LLPAHs), and metals. In addition, those locations sampled in June 2008 with rejected VOC results (61SB03, 61SB04, 61-SB09, and 61SB10, 61SB13, 61SB14, and 61SB15) will be re-sampled and analyzed for VOCs. At a given location, re-sampling will be limited to the specific depth interval with rejected data. For example, rejected data at 61SB15 were limited to soil collected from the 9 to 11 ft depth interval. Therefore, re-sampling at 61SB15 will be limited to this depth interval.

- Groundwater monitoring wells are proposed for installation in seven of the 32 borings, as shown on Figure 10. Groundwater samples will be collected from each of the seven newly installed wells as well as from the six existing wells. Groundwater samples will be analyzed for Appendix IX VOCs, SVOCs (including LLPAHs) and metals (total and dissolved fractions). Additionally, data from the proposed sampling at SWMU 54 should be reviewed to ascertain the impact of groundwater contamination from SWMU 54 on SWMU 61. To assist this evaluation, a simultaneous set of groundwater elevation measurements will be collected from the SWMU 61 monitoring wells and from each of the SWMU 54 monitoring wells. Top of casing elevations will be determined for each newly installed well.

- A total of 20 sediment samples will be collected from the freshwater wetland area from a depth of 0 to 0.25 ft bgs (see Figure 11). The sediment samples will be analyzed for Appendix IX SVOCs, Appendix IX metals, total organic carbon (TOC) and acid volatile sulfide/ simultaneously-extracted metals (AVS/SEM).

- A total of ten background sediment samples are proposed for collection from the freshwater wetland area to supplement the existing background samples and to provide a sufficient number of samples to conduct statistical analysis of the data set. These sediment samples will be analyzed for Appendix IX metals.

The PEM1 wetland depicted on the various figures attached to this Request for Additional Sampling was delineated by Geo-marine, Inc. in December 1999 from 1993 color infrared and 1998 true color photography. As such the PEM1 wetland boundary does not represent a field delineated jurisdictional boundary. Therefore, as part of the additional sampling effort, the wetland boundary within the borders of the SWMU will be field-delineated in accordance with the 1987 Corps of Engineers wetland delineation manual.

Initiation of the additional work described herein will begin once the Navy approves a formal scope of work and secures the necessary funding for project implementation.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124.

Sincerely,

MICHAEL BAKER JR., INC.

Mark E. Kimes, P.E.
Activity Coordinator

MEK/lp
Attachments

cc: Ms. Debra Evans-Ripley, BRAC PMO SE (letter only)
Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy)
Mr. Pedro Ruiz, NAPR (1 hard copy)
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy)
Mr. Felix Lopez, US F&WS (1 hard copy)
Mr. Jonathan Flewelling, TechLaw, Inc. (1 hard copy)
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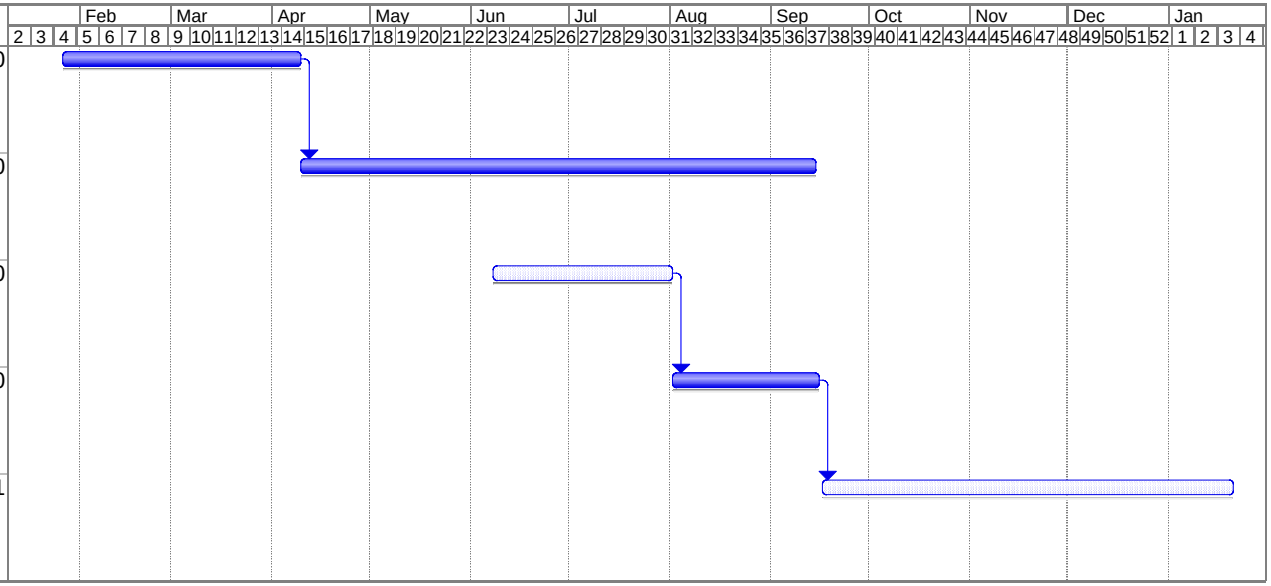
PROPOSED SCHEDULE

PROPOSED SCHEDULE
FOR ADDITIONAL SAMPLING
SWMU 61
CORRECTIVE MEASURES STUDY (CMS) INVESTIGATION

Task Name	Duration	Start	Finish
CMS Field Investigation	73 edays	1/27/10	4/10/10
Draft CMS Report Development	158 edays	4/10/10	9/15/10
Regulator Review	55 edays	6/8/10	8/2/10
Final CMS Report Development	45 edays	8/2/10	9/16/10
Regulator Review and Approval	90 days	9/17/10	1/20/11



Project: SWMU 61.mpp
Date: 3/11/10

Task

Regulator Review