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NSA CRANE
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TECHNICAL MEMORANDUM REGARDING ADDITIONAL SAMPLING AND ANALYSIS SOLID WASTE MANAGEMENT UNIT 17 (SWMU 17) BOGGS CREEK DITCH 3 NORTHWEST DITCH REVISION 1 NSA CRANE IN

1/20/2011

TETRA TECH

TECHNICAL MEMORANDUM

DATE: January 20, 2011, Revision 1

TO: Mr. Howard Hickey, NAVFAC MW

FROM: Steve Ruffing, Tetra Tech, Pittsburgh, PA

Ralph Basinski, Tetra Tech, Pittsburgh, PA

cc: Mr. Tom Brent, NSA Crane

Mr. John Trepanowski, Tetra Tech

Project File – CTO 42

SUBJECT: NSA Crane – Additional Sampling and Analysis for SWMU 17 (Boggs Creek, Ditch 3, Northwest Ditch)

PROJECT DESCRIPTION

The Naval Support Activity (NSA) Crane prepared a Quality Assurance Project Plan (QAPP) [Tetra Tech NUS, Inc. (Tetra Tech), 2001] for a Phase III Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at Solid Waste Management Unit (SWMU) 17 to provide data regarding polychlorinated biphenyl (PCB) contamination in surface and subsurface soil at the PCB Capacitor Burial/Pole Yard. Following approval of the QAPP, Tetra Tech began site activities in March 2002.

In June 2005, the Navy prepared a QAPP Addendum (Tetra Tech, 2005) to address data gaps regarding PCB contamination in surface soil, subsurface soil, perched groundwater, surface water, and sediment at SWMU 17.

Based on the previous field investigations in which unacceptable risk was identified related to PCB contamination at SWMU 17, the Navy prepared a QAPP Addendum No. 2 (Tetra Tech, 2006a) to identify the full extent of the contamination specifically in ditches 1 through 10 leading into Boggs Creek, Boggs Creek headwaters, Boggs Creek plunge pool, and upper portion of Boggs Creek itself.

Due to PCB contamination found within the headwaters of Boggs Creek, the Navy prepared a QAPP Addendum No. 3 (Tetra Tech, 2006b) to gather data that would allow the RFI report to be completed, including the delineation of the nature and extent of PCB contamination, primarily in the area around Building 2721 and the tributary flowing west from Building 2721 to Boggs Creek.

In August 2008, the Navy prepared a QAPP Addendum No. 4 (Tetra Tech, 2008) to determine the full extent of PCB contamination in the surface water and sediment associated with Boggs Creek to its termination into Lake Gallimore. Results from this sampling event demonstrated that PCBs were not migrating into Lake Gallimore via Boggs Creek surface water or sediment, which is documented in the Field Investigation Report for SWMU 17 – Boggs Creek (Tetra Tech, 2010). Removal actions were recommended for 411 cubic yards of sediment from the northwestern ditch, Boggs Creek Stream Segment 1, Ditch 3 Stream Segment 2, and Ditch 3 Segment 6, all of which are the focuses of this technical memorandum.

The purpose of this memorandum is to provide recommendations for additional sampling and analysis in accordance with QAPP Addendum No. 4 (Tetra Tech, 2008) to delineate the extent of sediment contamination in Ditch 3 Segment 6 and the horizontal extent of sediment contamination in the floodplain of the stream sections to be excavated to obtain sufficient data to prepare the Interim Measures Work Plan (IMWP) in support of removal actions.

BACKGROUND

The PCB capacitor Burial/Pole Yard (SWMU 17) has been in use since before 1966. Historically, the site has been used for the following:

- Storage of capacitors, some of which contained PCBs.
- Storage of transformers, some of which contained PCBs.
- Reported burial of capacitors, some of which may have contained PCBs.
- Storage of creosote-impregnated utility poles, some of which may contain PCBs as a result of burst transformers.

Pure PCBs have never been found in transformers or capacitors at NSA Crane. The greatest concentrations of PCBs have been in the range of 10,000 ppm PCBs. Therefore, any releases of capacitor or transformer oil at SWMU 17 would be expected to exhibit concentrations, in the range of 10,000 ppm PCBs. It is known that capacitors were buried at SWMU 17 in the early to mid 1970s. However, it is not known whether any capacitors were buried prior to the early 1970s or after mid-1970.

RECOMMENDATIONS

Based on a review of the current data, additional data needs to be collected to better determine the horizontal extent of contamination in the ditch and floodplains associated with stormwater runoff from Building 2721. Samples will be collected along four different areas: Northwest Ditch, Boggs Creek Segment 1, Ditch 3 Segment 2, and Ditch 3 Segment 6. The following sections provide detail regarding the proposed additional sampling. Table 1 provides a description of the sampling plan for each of the four different areas.

- Ditch 3 Segment 6

  A total of six samples will be collected from three locations in the floodplain surrounding Ditch 3 Segment 6. Three surface soil samples will be collected at a depth of 0 to 6 inches bgs (Round 1 samples) for analysis and three soil samples will be collected at a depth of 6 to 12 inches bgs (Round 2 samples) for potential analysis. The 6 to 12 inch bgs samples will be sent to the laboratory and placed on hold and will only be analyzed if the collocated 0 to 6 inch bgs sample has a PCB concentration greater than 1 ppm. Each sample will be collected via disposable plastic trowel unless the ground is frozen. In this instance, a coring device will be used and a rinsate blank collected per each type of coring device.

  Additionally, 16 sediment samples will be collected from a depth of 0 to 6 inches bgs. Prior to collection, the sediment profile and width of channel will be measured. One sample will be collected if the profile does not exceed 8 inches bgs. Should the sediment profile exceed 8 inches, a second sample will be collected from 6 to 12 inches bgs. Each sample will be collected via disposable plastic trowel. If the ground is frozen, a coring device will be used and a rinsate blank will be collected per each type of coring device used. Figure 1 shows all proposed sample locations and results from previous sampling events. Sample locations were selected to fill data gaps regarding PCB contamination within this stream channel east of 17SD61. Table 1 lists proposed samples.

- Boggs Creek Segment 1, Ditch 3 Segment 2, and Northwest Ditch

  A total of 64 samples will be collected from 32 locations within the estimated floodplain area that surrounds Boggs Creek Segment 1, Ditch 3 Segment 2, and the Northwest Ditch (11 samples, 17 samples, and 4 samples respectively). Thirty-two discrete surface soil samples will be collected at a depth of 0 to 6 inches bgs (Round 1 samples) for analysis and 32 discrete soil samples will be collected at a depth of 6 to 12 inches bgs (Round 2 samples) for potential analysis. The 6 to 12 inch bgs samples will be sent to the laboratory and placed on hold and will only be analyzed if the collocated 0 to 6 inch bgs sample has a concentration greater than 1 ppm. Each sample will be collected via disposable plastic trowel. If the soil is frozen, a coring device will be used. A rinsate blank will be collected for each type of coring device used. Figure 2 shows proposed sample locations along with concentrations from previous sampling events. Locations were selected based on previous sampling events and are spatially distributed across the estimated floodplain. Sample locations may be moved due to site conditions.

Additional information regarding quality assurance data can be found in Table 2. A field duplicate will be collected at a rate of 1 per every 20 samples per media. A rinsate blank will be collected for each coring device used that is not disposable.

A global positioning system (GPS) will be used to collect coordinates of all sampling locations. In addition, site photos will be taken and a description for each photo will be noted. Photos will include pictures of segments containing sample locations, as well as all portions of SWMU 17. The standard operating procedure (SOP) for the GPS is enclosed with this technical memorandum.

All samples will be field documented in accordance with the procedures described in QAPP Addendum No. 4 (Tetra Tech, 2008). This work is tentatively scheduled to be performed beginning January 17, 2011.

TABLE 1

LISTING OF SAMPLES
SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD
QAPP ADDENDUM NO.4 – TECHNICAL MEMORANDUM
NSA CRANE
CRANE, INDIANA

SAMPLING AREA		Round 1 Samples		Round 2 Samples [2]	
	SAMPLE LOCATION	SAMPLE ID	SAMPLE DEPTH [1] (inches bgs)	SAMPLE ID	SAMPLE DEPTH (inches bgs)
Ditch 3 – Segment 6	17SD106	17SD1060006	0 - 6	NA	NA
	17SD107	17SD1070006	0 - 6	NA	NA
	17SD108	17SD1080006	0 - 6	NA	NA
	17SD109	17SD1090006	0 - 6	NA	NA
	17SD110	17SD1100006	0 - 6	NA	NA
	17SD111	17SD1110006	0 - 6	NA	NA
	17SD112	17SD1120006	0 - 6	NA	NA
	17SD113	17SD1130006	0 - 6	NA	NA
	17SD114	17SD1140006	0 - 6	NA	NA
	17SD115	17SD1150006	0 - 6	NA	NA
	17SD116	17SD1160006	0 - 6	NA	NA
	17SD117	17SD1170006	0 - 6	NA	NA
	17SD118	17SD1180006	0 - 6	NA	NA
	17SD119	17SD1190006	0 - 6	NA	NA
	17SD120	17SD1200006	0 - 6	NA	NA
	17SB87	17SB870006	0 – 6	17SB870612	6-12
	17SB88	17SB880006	0 – 6	17SB880612	6-12
	17SB89	17SB890006	0 – 6	17SB890612	6-12
Ditch 3 – Segment 2	17SB90	17SB900006	0 – 6	17SB900612	6-12
	17SB91	17SB910006	0 – 6	17SB910612	6-12
	17SB92	17SB920006	0 – 6	17SB920612	6-12
	17SB93	17SB930006	0 – 6	17SB930612	6-12
	17SB94	17SB940006	0 – 6	17SB940612	6-12
	17SB95	17SB950006	0 – 6	17SB950612	6-12

TABLE 1

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SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD
QAPP ADDENDUM NO.4 – TECHNICAL MEMORANDUM
NSA CRANE
CRANE, INDIANA

SAMPLING AREA		Round 1 Samples		Round 2 Samples [2]	
	SAMPLE LOCATION	SAMPLE ID	SAMPLE DEPTH [1] (inches bgs)	SAMPLE ID	SAMPLE DEPTH (inches bgs)
	17SB96	17SB960006	0 – 6	17SB960612	6-12
	17SB97	17SB970006	0 – 6	17SB970612	6-12
	17SB98	17SB980006	0 – 6	17SB980612	6-12
	17SB99	17SB990006	0 – 6	17SB980612	6-12
	17SB100	17SB1000006	0 – 6	17SB1000612	6-12
	17SB101	17SB1010006	0 – 6	17SB1010612	6-12
	17SB102	17SB1020006	0 – 6	17SB1020612	6-12
	17SB103	17SB1030006	0 – 6	17SB1030612	6-12
	17SB104	17SB1040006	0 – 6	17SB1040612	6-12
	17SB105	17SB1050006	0 – 6	17SB1050612	6-12
	17SB106	17SB1060006	0 – 6	17SB1060612	6-12
Northwest Ditch	17SB107	17SB1070006	0 – 6	17SB1070612	6-12
	17SB108	17SB1080006	0 – 6	17SB1080612	6-12
	17SB109	17SB1090006	0 – 6	17SB1090612	6-12
	17SB110	17SB1100006	0 – 6	17SB1100612	6-12
Boggs Creek – Segment 1	17SB111	17SB1110006	0 - 6	17SB1110612	6-12
	17SB112	17SB1120006	0 – 6	17SB1120612	6-12
	17SB113	17SB1130006	0 – 6	17SB1130612	6-12
	17SB114	17SB1140006	0 – 6	17SB1140612	6-12

TABLE 1

LISTING OF SAMPLES
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QAPP ADDENDUM NO.4 – TECHNICAL MEMORANDUM
NSA CRANE
CRANE, INDIANA

SAMPLING AREA		Round 1 Samples		Round 2 Samples [2]	
	SAMPLE LOCATION	SAMPLE ID	SAMPLE DEPTH [1] (inches bgs)	SAMPLE ID	SAMPLE DEPTH (inches bgs)
	17SB115	17SB1150006	0 – 6	17SB1150612	6-12
	17SB116	17SB1160006	0 – 6	17SB1160612	6-12
	17SB117	17SB1170006	0 – 6	17SB1170612	6-12
	17SB118	17SB1180006	0 – 6	17SB1180612	6-12
	17SB119	17SB1190006	0 – 6	17SB1190612	6-12
	17SB120	17SB1200006	0 – 6	17SB1200612	6-12
	17SB121	17SB1210006	0 – 6	17SB1210612	6-12

SB = Soil Boring
SD = Sediment
XXXX = Depth of sample

(1) Measurement of sediment depth will take place prior to sampling. Sediment samples will be collected over the entire profile of the sediment; therefore, samples could potentially exceed a depth of 6 inches. If sample depth is up to 8 inches, 1 sample will be collected and the ID will be change to the depth at which it was collected. If the sample depth exceeds 8 inches, a second sample will be collected.
(2) Round 2 Samples will only be analyzed if the PCB results from the associated Round 1 sample exceed 1 ppm.

TABLE 2

SUMMARY OF SURFACE SOIL AND SEDIMENT ANALYSES AND QUALITY CONTROL SAMPLES
SWMU 17 – PCB CAPACITOR BURIAL/POLE YARD
QAPP ADDENDUM NO. 4 – TECHNICAL MEMORANDUM
NSA CRANE
CRANE, INDIANA

Sample Type	PCBs	
	SW-8082A (Sediment)	SW-8082A (Surface Soil)
Total Samples	15	70[2]
Field Duplicates [1]	1	4
Rinsate Blanks [3]	0	0
Matrix Spikes [4]	1	4
Matrix Spike Duplicates [5]	1	4
TOTAL	18	82

1. Field duplicates will be collected at a frequency of 1 per every 20 samples per media.

2. Seventy soil samples will be collected; however, 35 will be analyzed immediately (Round 1) and the remaining 35 (Round 2) will be extracted and held by the laboratory for potential analysis.

3. Rinsate blanks will be collected at a frequency of one per sampling device or instrument only if samples are collected via hand auger or stainless steel trowel.

4. Matrix spikes are collected for all organic and inorganic parameters at a frequency of 1 per every 20 field samples.

5. Matrix spike duplicates are collected for all organic parameters. Matrix spike duplicates are collected at a frequency of 1 per every 20 samples.

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU17_PROPOSED_SWSD.MXD 01/06/11 TW

N

17SD59 ND
17SD58 0.29
17SB54 (0-2 ft) 0.2
17SB64/TW03 (0-1 ft) 0.099 (2-4 ft) ND (13-15 ft) ND
17SB60 (0-1 ft) 0.28 (2-4 ft) 0.54 (17-19 ft) ND
17SB61 (0-2 ft) 0.1 (2-4 ft) ND (16-18 ft) ND
17SB51 (0-2 ft) ND (2-4 ft) ND (17-19 ft) ND
17SB52 (0-2 ft) ND (2-4 ft) ND
17SB50 (0-2 ft) ND (2-4 ft) ND (16-18 ft) ND
17SB53 (0-1 ft) 0.084 (2-4 ft) ND (18-20 ft) ND
17SB56 (0-2 ft) ND
17SB58 (0-2 ft) ND
17SB57 (0-2 ft) 0.083
17SB59 (0-1 ft) ND
17SD57 ND
17SB55 (0-2 ft) 73
17SB62/TW02 (0-1 ft) 0.047 (2-4 ft) ND (11-13 ft) ND
17SB63 (0-2 ft) 0.044
17SB65 (0-1 ft) 0.1 (2-4 ft) ND (14-16 ft) ND
17SB66 (0-1 ft) 0.028 (2-4 ft) ND (14-16 ft) ND
17SB67 (0-2 ft) ND
17SB68 (0-2 ft) 0.05
17SD61 70
17SB75 11
17SD62 7.1
17SD63 0.72
17SD64 4.1
17SB76 1.6
17SD60 0.012
17SB77 2.3
17SD42 ND
17SB78 0.66
17SD43 3.3
17SD44 0.57
17SD56 0.26
17SB69 0.18
17SB71 (0-1 ft) 0.039 (2-3 ft) ND
17SB72 (0-1 ft) ND
17SB70/TW04 (0-1 ft) ND (2-4 ft) ND (4-5 ft) ND

DITCH 3 (SEGMENT 6)
DITCH 3 (SEGMENT 5)
SURFACE SOIL AREA 2
700
750
2721
2890
353
354
1894

SEE FIGURE 1-3 FOR MORE RESULTS

Legend

- Sample Location with PCBs < 1
- Sample Location with PCBs > 1
- Proposed Sample Location
- ND Non Detect
- Sample Result Exceeds 1 mg/kg
- Fenceline
- Building
- Former Building
- Railroad
- Road
- Stream
- Topographic Contour (10-ft Interval)

Notes:
1.) Sample results represent total PCBs (summation of aroclor results). Results reported in mg/kg.
2.) Results presented without depth indication correspond to sample collected from 0-0.5 feet.

90 45 0 90 Feet

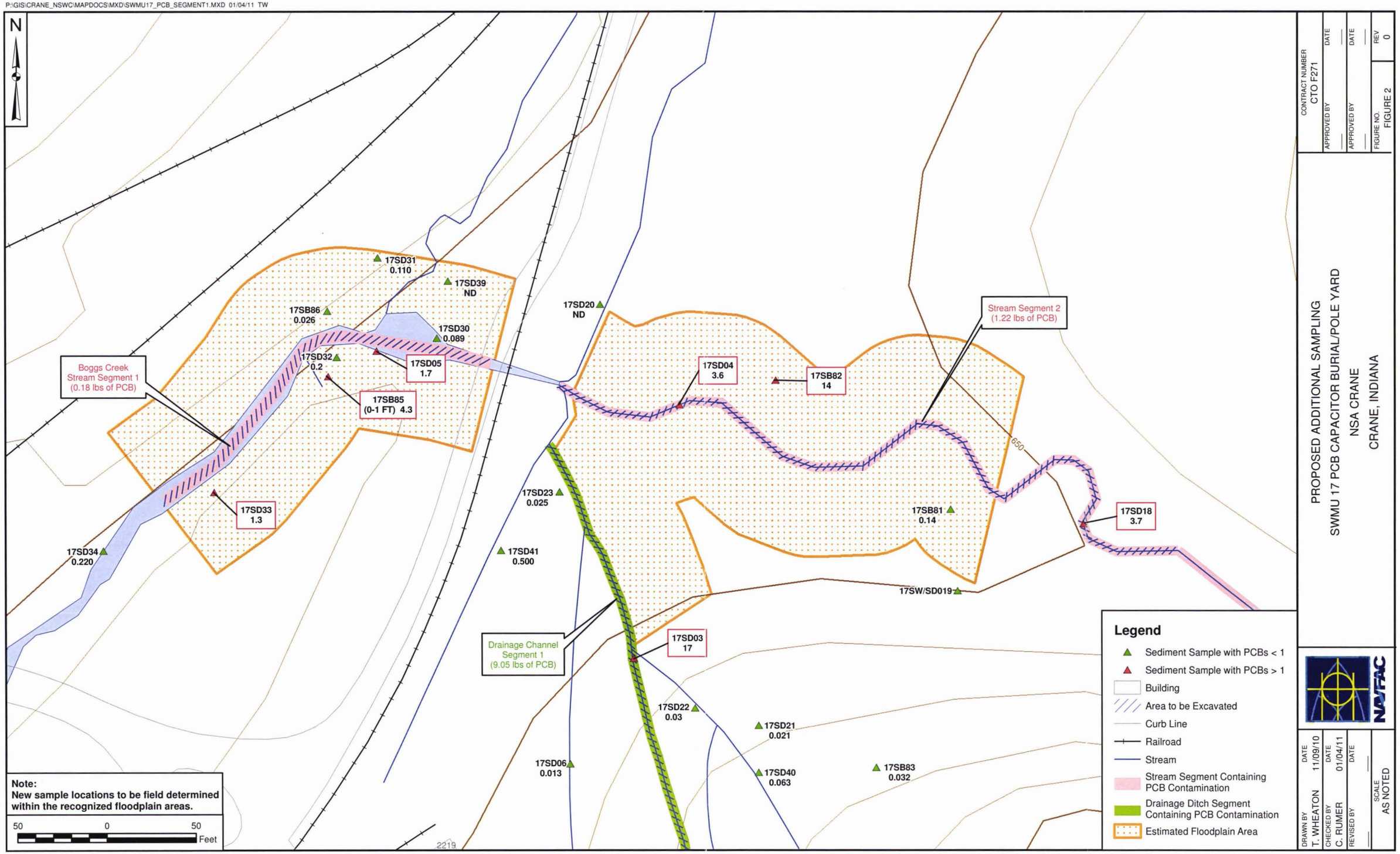
CONTRACT NUMBER CTO F271
APPROVED BY — DATE —
APPROVED BY — DATE —
FIGURE NO. FIGURE 1
REV 0

PROPOSED SAMPLE LOCATIONS
SMWU 17 - BOGGS CREEK
NSA CRANE
CRANE, INDIANA

NAVFAC

DRAWN BY T. WHEATON DATE 11/02/10
CHECKED BY C. RUMER DATE 01/06/11
COST/SCHEDULE-AREA
SCALE AS NOTED

P:\GIS\CRANE_NSWC\MAPDOCS\MXD\SWMU17_PCB_SEGMENT1.MXD 01/04/11 TW



PROPOSED ADDITIONAL SAMPLING
SWMU 17 PCB CAPACITOR BURIAL/POLE YARD
NSA CRANE
CRANE, INDIANA

CONTRACT NUMBER CTO F271	APPROVED BY	DATE	REV 0
	APPROVED BY	DATE	
FIGURE NO. FIGURE 2			

NAVFAC

DRAWN BY T. WHEATON	DATE 11/09/10	SCALE AS NOTED	
CHECKED BY C. RUMER	DATE 01/04/11		
REVISED BY	DATE		

STANDARD OPERATING PROCEDURE
GLOBAL POSITIONING SYSTEM

1.0 PURPOSE

The purpose of this Standard Operating Procedure (SOP) is to provide the field personnel with basic instructions for operating a handheld Global Positioning System (GPS) unit allowing them to set GPS parameters in the receiver, record GPS positions on the field device, and update existing Geographic Information System (GIS) data. This SOP is specific to GIS quality data collection for Trimble®-specific hardware and software.

If possible, the Trimble® GeoXM™ or GeoXH™ operators manual should be downloaded onto the operator's personal computer for reference before or while in the field. The manual can be downloaded at http://trl.trimble.com/docushare/dsweb/Get/Document-311749/TerraSyncReferenceManual.pdf

Unless the operator is proficient in the setup and operation of the GPS unit, the Project Manager (or designee) should have the GPS unit shipped to the project-specific contact listed below in the Pittsburgh, Pennsylvania, office at least five working days prior to field mobilization so project-specific shape files, data points, background images, and correct coordinate systems can be uploaded into the unit.

Tetra Tech NUS, Inc.
Attn: John Wright
661 Anderson Drive, Bldg #7
Pittsburgh, PA 15220

2.0 REQUIRED EQUIPMENT

The following hardware and software should be utilized for locating and establishing GPS points in the field:

2.1 Required GPS Hardware

- Hand-held GPS unit capable of sub-meter accuracy (i.e. Trimble® GeoXM™ or Trimble® GeoXH™). This includes the docking cradle, A/C adapter, stylus, and USB cable for data transfer.
  Optional Accessories:
  - External antenna
  - Range pole
  - Hardware clamp (for mounting GPS unit to range pole)

- GeoBeacon
- Writing utensil (preferably black pen with indelible ink)
- Non-metallic pin flags for temporary marking of positions

2.2 Required GPS Software

The following software is required to transfer data from the handheld GPS unit to a personal computer:

- Trimble® TerraSync version 2.6 or later (pre-loaded onto GPS unit from vendor)

- Microsoft® ActiveSync® version 4.5 or later. Download to personal computer from: http://www.microsoft.com/windowsmobile/en-us/downloads/microsoft/activesync-download.mspx

- Trimble® Data Transfer Utility (freeware version 2.1 or later). Download to personal computer from: http://www.trimble.com/datatransfer.shtml

3.0 START-UP PROCEDURES

Prior to utilizing the GPS in the field, ensure the unit is fully charged. The unit may come charged from the vendor, but an overnight charge is recommended prior to fieldwork.

The Geo-series GPS units require a docking cradle for both charging and data transfer. The Geo-series GPS unit is docked in the cradle by first inserting the domed end in the top of the cradle, then gently seating the contact end into the latch. The power charger is then connected to the cradle at the back end using the twist-lock connector. Attach a USB cable as needed between the cradle (B end) and the laptop/PC (A end).

It is recommended that the user also be familiar and check various Windows Mobile settings. One critical setting is the Power Options. The backlight should be set as needed to conserve power when not in use.

Start Up:

1) Power on the GPS unit by pushing the small green button located on the lower right front of the unit.

2) Utilizing the stylus that came with the GPS unit, launch **TerraSync** from the Windows Operating System by tapping on the start icon located in the upper left hand corner of the screen and then tap on **TerraSync** from the drop-down list.

3) If the unit does not default to the Setup screen, tap the Main Menu (uppermost left tab, just below the Windows icon) and select Setup.

4) If the unit was previously shipped to the Pittsburgh office for setup, you can skip directly to Section 4.0. However, to confirm or change settings, continue on to Section 3.1.

3.1 Confirm Setup Settings

Use the Setup section to confirm the TerraSync software settings. To open the Setup section, tap the Main Menu and select Setup.

1) Coordinate System
   a. Tap on the Coordinate System.
   b. Verify the project specs are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu. **Note:** It is always best to utilize the Cancel tab rather than the OK tab if no changes are made since configurations are easily changed by mistake.
   c. Tap on the Units.
   d. Verify the user preferences are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   e. Tap Real-time Settings.
   f. Verify the Real-time Settings are correct for your specific project by scrolling through the various settings. Edit as needed and then tap OK; otherwise, tap Cancel to return to Setup Menu.
   g. The GPS unit is now configured correctly for your specific project.

4.0 ANTENNA CONNECTION

1) If a connection has been properly made with the internal antenna, a satellite icon along with the number of usable satellites will appear at the top of the screen next to the battery icon. If no connection is made (e.g.: no satellite icon), tap on the GPS tab to connect antenna.
2) At this point the GPS unit is ready to begin collecting data.

5.0 COLLECTING NEW DATA IN THE FIELD

1) From the Main Menu select Data.

2) From the Sub Menu (located below the Data tab) select New which will bring up the New Data File menu.
3) An auto-generated filename appears and should be edited for your specific project. If the integral keyboard does not appear, tap the small keyboard icon at the bottom of the screen.
4) After entering the file name, tap Create to create the new file.
5) Confirm antenna height if screen appears. Antenna height is the height that the GPS unit will be held from the ground surface (Typically 3 to 4 feet).
6) The Choose Feature screen appears.

5.1 Collecting Features

1) If not already open, the Collect Feature screen can be opened by tapping the Main Menu and selecting Data. The Sub Menu should default to Collect.
2) **Do not begin the data logging process until you are at the specific location for which you intend to log the data.**
3) A known reference or two should be shot at the beginning and at the end of each day in which the GPS unit is being used. This allows for greater accuracy during post-processing of the data.
4) Upon arriving at the specific location, tap on Point_generic as the Feature Name.
5) Tap Create to begin data logging.
6) In the Comment Box enter sample ID or location-specific information.
7) Data logging can be confirmed by viewing the writing pencil icon in the upper part of the screen. Also, the logging counter will begin. As a Rule of Thumb, accumulate a minimum of 20 readings on the counter, per point, as indicated by the logging counter before saving the GPS data.
8) Once the counter has reached a minimum number of counts (i.e. 20), tap on OK to save the data point to the GPS unit. Confirm the feature. All data points are automatically saved within the GPS unit.
9) Repeat steps 2 through 8, giving each data point a unique name or number.

Note: If the small satellite icon or the pencil icon is blinking, this is an indication the GPS unit is not collecting data. A possible problem may be too few satellites. While still in data collection mode, tap on Main Menu in upper left hand corner of the screen and select Status. Skyplot will display as the default showing the number of available satellites. To increase productivity (number of usable satellites) use the stylus to move the pointer on the productivity and precision line to the left. This will decrease precision, but increase productivity. The precision and productivity of the GPS unit can be adjusted as the number of usable satellites changes throughout the day. To determine if GPS is correctly recording data, see Section 5.2.

5.2 Viewing Data or Entering Additional Data Points to the Current File

1) To view the stored data points in the current file, tap on the Main Menu and select Map. Stored data points for that particular file will appear. Use the +/- and <-/-> icons in lower left hand corner of screen to zoom in/out and to manipulate current view.
2) To return to data collection, tap on the Main Menu and select Data. You are now ready to continue to collect additional data points.

5.3 Viewing Data or Entering Data Points from an Existing File

1) To view data points from a previous file, tap on Main Menu and select Data, then select File Manager from the Sub Menu.
4) Highlight the file you want to view and select Map from the Main Menu.
5) To add data points to this file, tap on Main Menu and select Data. Continue to collect additional data points.

6.0 NAVIGATION

This section provides instructions on navigating to saved data points in an existing file within the GPS unit.

1) From the Main Menu select Map.
2) Using the Select tool, pick the point on the map to where you want to navigate.
3) The location you select will have a box placed around the point.
4) From the Options menu, choose the Set Nav Target (aka set navigation target).
5) The location will now have double blue flags indicating this point is you navigation target.
6) From the Main Menu select Navigation.
7) The dial and data on this page will indicate what distance and direction you need to travel to reach the desired target.
8) Follow the navigation guide until you reach the point you select.
9) Repeat as needed for any map point by going back to Step 1.

7.0 PULLING IN A BACKGROUND FILE

This section provides instructions on pulling in a pre-loaded background file. These files are helpful in visualizing your current location.

1) From the Main Menu select Map, then tap on Layers, select the background file from drop down list.

2) Select the project-specific background file from the list of available files.
3) Once the selected background file appears, the operator can manipulate the screen utilizing the +/- and <-/-> functions at the bottom of the screen.
4) In operating mode, the operator's location will show up on the background file as a floating "x".

8.0 DATA TRANSFER

This section provides instructions on how to transfer stored data on the handheld GPS unit to a personal computer. Prior to transferring data from the GPS unit to a computer, Microsoft ActiveSync and Trimble Data Transfer Utility software must be downloaded to the computer from the links provided in Section 2.2 (Required GPS Software). If a leased computer is utilized in which the operator cannot download files, see the Note at the end of Section 8.0.

1) See Attachment A at the end of this SOP for instructions on how to transfer data from the GPS to a personal computer.

Note: If you are unable to properly transfer data from the GPS unit to a personal computer, the unit should be shipped to the project-specific contact listed in Section 1.0 where the data will be transferred and the GPS unit then shipped back to the vendor.

9.0 SHUTTING DOWN

This section provides instruction for properly shutting down the GPS unit.

1) When shutting down the GPS unit for the day, first click on the "X" in the upper right hand corner.
2) You will be prompted to ensure you want to exit TerraSync. Select Yes.
3) Power off the GPS unit by pushing the small green button located on the bottom face of the unit.
4) Place the GPS unit in its cradle to recharge the battery overnight. Ensure the green charge light is visible on the charging cradle.

ATTACHMENT A

How to Transfer Trimble GPS Data between Data Collector and PC
original 11/21/06 (5/1/08 update) – John Wright

Remember – Coordinate System, Datum, and Units are critical!!!

Trimble Data Collection Devices:
Standard rental systems include the Trimble® ProXR/XRS backpack and the newer handheld GeoXT™ or GeoXH™ units. Some of the older backpack system may come with either a RECON "PDA-style" or a TSCe or TSC1 alpha-numeric style data collector.

The software on all of the above units should be Trimble® TerraSync (v 2.53 or higher – current version is 3.20) and to the user should basically look and function similar. The newer units and software versions (which should always be requested when renting) include enhancements for data processing, real-time display functions, and other features.

Data Transfer:
Trimble provides a free transfer utility program to aid in the transfer of GIS and field data. The Data Transfer Utility is a standalone program that will run on a standard office PC or laptop.

To connect a field data collector such as a RECON, GeoXM, GeoXT, GeoXH, or ProXH, you must first have Microsoft® ActiveSync® installed to allow the PC and the data collector to talk to one another. A standard USB cable is also needed to connect the two devices.

A CD or USB drive is provided with the data collector for use in data transfer. If needed, these programs are also available without charge via the web at:

• **Trimble Data Transfer Utility** (v 1.38) program to download the RECON or GeoXH field data to your PC: http://www.trimble.com/datatransfer.shtml

• **ActiveSync** from Microsoft to connect the data collector to the PC. The latest version (v4.5) can be found at: http://www.microsoft.com/windowsmobile/en-us/downloads/microsoft/activesync-download.mspx
(see page 2 for data transfer instructions)

To Transfer Data Collected in the Field:

• Install the Data Transfer and ActiveSync software installed on your PC
• Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
• ActiveSync should auto-detect the connection and recognize the data collector
• Make sure the data file desired is CLOSED in TerraSync prior to transfer
• Connect via ActiveSync as a guest (not a partnership)
• Run the Trimble Data Transfer Utility program on your PC
• Select "***GIS Datalogger on Windows CE***" or similar selection
• Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
• Select the "***Receive***" data tab (under device)
• Select "***Data***" from file types on the right
• Find the file(s) needed for data transfer. You can sort the data files by clicking on the date/time header
• Select or browse to a C-drive folder you can put this file for emailing
• When the file appears on the list, hit the "***Transfer All***"
• Go to your Outlook or other email, send a message to: John.Wright@tetratech.com (or GIS department)
• Attach the file(s) you downloaded from your C-drive. For each TerraSync data file created you should have a packet of multiple data files. All need to be sent as a group – make sure you attach all files (the number of files may vary – examples include: ssf, obx, obs, gix, giw, gis, gip, gic, dd, and car)

To Transfer GIS Data from PC to the Field Device (must be converted in Pathfinder Office):

• Obtain GIS file(s) desired from GIS Department and have converted to Trimble extension
• Contact John Wright (John.Wright@tetratech.com) if needed for file conversion and upload support
• The GIS file(s) can be quickly converted if requested and sent back to the field user in the needed "Trimble xxx.imp" extension via email – then quickly downloaded from Outlook to your PC for transfer
• Install the Data Transfer and ActiveSync software installed on your PC
• Connect the RECON or GeoXH to your PC via an A/B USB cable (blade end and square end type "HP printer" style)
• ActiveSync should auto-detect the connection and recognize the data collector
• Connect via ActiveSync as a guest (not a partnership)
• Run the Trimble Data Transfer Utility program on your PC
• Select "***GIS Datalogger on Windows CE***" or similar selection
• Hit the green connect icon to the right - the far right area should say "***Connected to ....***" if successful
• Select the "**Send**" data tab (under device)
• Select "**Data**" from file types on the right (you can also send background files)
• Browse to the location of the data on your PC (obtain the file from Pathfinder Office or from the person who converted the data for field use)
• Select the options as appropriate for the name and location of the data file to go on the data collector (usually you can choose main memory or a data storage card)
• When the file(s) appears on the list, hit the "***Transfer All***"
• Run TerraSync on the field device and open the existing data files. Your transferred file should appear (make sure you have selected Main Memory, Default, or Storage Card as appropriate)