

APPENDIX A

Excavation Field Reports 2006 and 2007

FIELD REPORT, FORT TOTTEN CONTENT SAMPLING ON 9 MAY 2006

Introduction

A one day exploratory investigation at Building 615, Fort Totten, Bayside, Queens was completed on 8 May 2006. Present during the site visit were: James Gatherer and Kim Shutty (EA), Debra Ford and Vernon Griffin (US ACE), and Bob Terry, an operator and laborer (Terry Contracting). The purpose of the exploratory investigation was to determine the discharge point of the floor drain, and complete soil sampling to determine the presence/absence of mercury-impacted soils at the discharge point. The following activities were completed at the site:

- Exploratory excavation of the parking area south of Bldg 615.
- Soil Sampling of possible discharge points of floor drain
- Interviews with and NYPD personnel, and second-hand anecdotal evidence from the electrician (Pete ?), and mechanic (Mike ?).

Findings

A septic tank was unearthed where the 20 April 2006 geophysical survey had located it. The septic tank was constructed of two courses of brick. It appeared to have once had a brick lid which may have been breached when Pete the Plumber retrieved his plumbing snake; brick debris was found inside the tank's interior. The location of the septic tank is approximately 3-feet south of an existing AST and 2-ft east of the seawall. It is 4-ft by 3-ft, and approximately 4-ft deep. The top lip of the tank is 6-in below the base of the concrete pad. Two 4-in cast iron pipes were inside the septic tank. One seems to be connected to the outfall pipe extruding from the seawall. The other pipe enters the tank from the north side of the tank. The limits of the excavation prohibited determining the origin of this pipe. It is possible that this pipe is connected to a second septic tank underlying the existing AST; Pete the Plumber reported encountering two side-by-side tanks when retrieving his plumbing snake. There is a clean-out ~4-ft south of the septic tank. A 4-in cast iron pipe lies across the top of the septic tank and is connected to this clean-out. This is apparently where the sewer was connected to the municipal sewer line instead of to the septic tank(s) where it had originally discharged. All toilets in Bldg 615 are apparently hooked up to this sewer line as evidenced by fluid observed in the clean-out when toilets were flushed.

However, a connection between the floor drain and this sewer line could not be established. Three methods were used to determine if there was a connection between the floor drain and sewer line.

- Running water down the floor drain to determine discharge point
Result: no fluid was observed or heard flowing past clean-out, and no excessively wet area was encountered in any other area of the excavation
- Tapping on the pipe at floor drain end and listening for an echo at the clean-out
Result: no echo was heard

- Dye released into the floor drain and observation of fluid color in clean-out
Result: no dye-coloring of fluid was observed in clean-out

Unable to confirm the discovered septic tank as the original discharge point for the floor drain, an attempt was made to locate the drain pipe and/or second septic tank closer the foot-print of Bldg 615 and further east of the discovered septic tank. Care was taken to excavate around a powerline encased in concrete about 2.5ft bgs. A 4-ft deep trench parallel to and ~6-ft from the building edge was excavated. However, no evidence of a drain pipe or septic tank was observed in this excavation.

At this point a decision was made to halt the excavation since further extending the trenching to the west and east of the existing trench would require the removal of the AST, and specialized reinforced-concrete cutting tools.

In the absence of a confirmed or observed floor drain discharge area, and in consultation with Debra Ford (USACE), three soil samples were collected in areas that may historically have been discharge areas:

- One composite soil sample was collected from the base of the septic tank for TCL VOC, SVOC, Pest/PCB, TAL metals and cyanide analysis.
- One grab soil sample was collected from an area of dark-colored soil adjacent to the septic tank for TCLP analysis.
- One composite soil sample was collected from an excavated trench for mercury analysis only.

Recommendations

It is recommended that exploratory excavations continue to determine the discharge area for the floor drain drain-line. However, prior to further intrusive activities, there are a few items that need to be addressed:

- Proximity to Building 615 excavation issues – We will need to determine how close we can excavate to the building without compromising its structural integrity during the content sampling, the soil boring program, and excavation phases of work. May involve contracting with a structural engineer during the content sampling, soil boring program, and excavation.
- Above Ground Storage Tank – The AST is possibly located above the second septic tank and floor drain drain-line leading from Bldg 615. Prior to continuing the excavation, it is recommended that the AST and associated containment structure be removed temporarily. This may involve work by special permit.

Decisions from 10May 2006 Conference Call

A conference call took place on 10 May 2006 between EA and ACE to discuss the results previous day's exploratory investigation, and where to proceed from there. It was concluded that further investigation is necessary to determine to discharge location of the floor drain drain-line. The following decisions were made:

- Acquisition of Sanborn Maps of the area if available. Sanborn Maps may shed light on location of drain-lines, septic tanks and other underground structures present at Bldg 615.
- Consultation with a plumber to aid in locating floor drain drain-line, and discharge areas.
- To continue exploratory excavations in the vicinity of Bldg 615. Specifically, it was agreed that excavating a continuous trench from the southwest corner to the southeast corner of Bldg 615, and parallel to the south face of Bldg 615 would be the best way to determine the location of the floor drain drain-line. The proposed excavation will be limited by a power-line encased in concrete that exits Bldg 615.



**FIELD REPORT, BUILDING 615 FORT TOTTEN EXPLORATORY
INVESTIGATION
30-31 OCTOBER 2006**

Introduction

A two day exploratory investigation at Building 615, Fort Totten, Bayside, Queens was completed from 30 to 31 October 2006. Present during the investigation were: James Gatherer (EA), Helen Kim (US ACE), and Sal Messina, Chris Zito, Manuel Garcia, Oscar Hernandez, Neptali Garcia, Jay Warner (Terry Contracting). The purpose of the exploratory investigation was to determine the discharge point of the floor drain, and complete soil sampling to determine the presence/absence of mercury-impacted soils at potential discharge points. The following activities were completed at the site:

- Exploratory excavation of the section of parking area south of Bldg 615 covered by an existing AST.
- Soil Sampling of possible discharge points of floor drain

Activities

Indoor activities included:

- Sampling and abatement of asbestos containing floor tile (performed 27 October)
- Excavation of Detective Robert Capozziello's office to uncover T-joint at 15-ft location
- Sampling of soil surrounding upstream and downstream bell joints
- Restoration of office space - resurfacing of floor with new floor tile

On 30 October, this area was excavated using a 6-inch concrete coring device. Two cores were completed: one to intersect the downstream bell joint location; one to intersect the upstream bell joint location. Two layers of concrete were encountered and removed: the first top layer was 6-inches thick while the bottom layer was 4-in thick. The underlying soil was subsequently excavated to uncover the drain-line. The depth to the mid-line of the drain-line was 2.5-ft below the floor.

Prior to the excavation on 30 October, floor tile and associated mastic was sampled to determine if it was asbestos containing. According to Detective Capozziello, he had the floor re-tiled about two years ago. Detective Capozziello reported that there was a second layer of tile below the recently installed tile. Both layers of tile plus the mastic were sampled and analyzed for asbestos. The bottom layer of floor tile was found to be asbestos containing. The subsequent abatement was completed on 27 October 2006 as a minor project (i.e. less than 10 square feet) as per NYC DEP requirements.

Outdoor activities included:

- The AST was re-located to a temporary location.
- The concrete pavement was removed.
- The area was excavated
- Excavated soils were stored in a lined 20-yard roll-off container
- Soil sampling at potential discharge areas and downgradient of drain-line discharge point
- At the conclusion of outdoor activities, the excavation was covered by road plates; the roll-off was covered.

Findings

Two septic tanks were excavated by hand digging. The septic tanks were constructed of two courses of brick and were in-line and upstream from the septic tank uncovered during the 9 May 2006 investigation. Septic tank #1 were dug out to a depth of 5-ft below the top of the brick. There was evidence of the tank being filled in. There was a layer of soil with brick and concrete debris from 3 to 4 feet below the top of the tank, suggesting the lid of the tank had been punched in and subsequently filled in. This probably occurred during the activities of Pete the Plumber. Figure 1 shows the location of the three septic tanks.

Septic tank #1 was excavated to a depth of 5-ft below the top of the tank. Soils at this point began to approach saturation, so excavation did not proceed any deeper. No bottom was encountered. It remains doubtful whether there is any bottom at all to these structures.

The live sewer line exits the building wall and lies across the 3 septic tanks. At one point, it most likely discharged into septic tank #1, the tank closest to the building. However, the sewer line has been hooked up the municipal sewer system. The old sewer line and more recent sewer line were joined about 2-ft out from the building wall. There is a leak in the old sewer line just as it exits the building wall.

During excavation activities, water was periodically introduced into the floor drain to determine if any discharge points (i.e. wet soil) could be located. Wet soil was encountered at the upstream bell joint at the 15-ft T-joint location, but nowhere else.

The apparent end of the drain-line was discovered. It appeared to be of the same material and diameter as the drain-line observed at the 15-ft T-joint. The end was flush with the footing wall. There was a 2-in metal pipe stuck inside it (Photo 1). This may have been used at one time to plug the drain-line. The top of the drain-line was 0.6-ft below the top lip of the footing wall.

It appears the drain-line never did drain into any of the septic tanks, but instead drained into the surrounding soil at the point of discharge at the footing wall (Photo 2). The evidence for this conclusion is based on:

- The end of the drain-line was flush with the building footing wall which implies it never extended beyond this point.
- Also, the drain-line's elevation as it exits the footing is below the top of the brick of the septic tanks.
- There were no perforations along the walls of the septic tank.

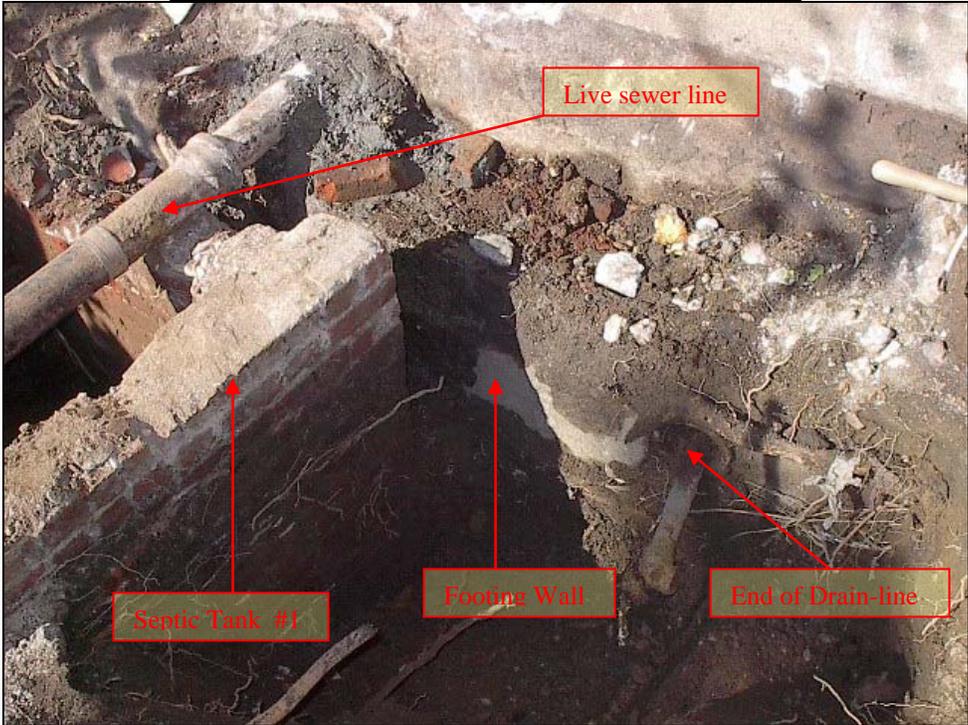
Soil Sampling

Soils were not collected between the tank#1 and the footing; there was less than 6-inches between the walls. Soils were also not collected to the west of the septic tanks since the tanks abut the sea wall. Elsewhere, soil samples were collected according to the rationale presented in the table below:

Sample ID	Sampling Location	Sampling Rationale	Soil Description	Headspace (ppm)	Analyses
SB06FUDS04-2.5	Soils adjacent to bell joint downstream of T-joint	To determine the presence/absence of mercury-impacted soils at bell joint (a potential discharge point)	Tan brown medium sand, dry	0	Mercury
SB06FUDS05-2.7	Soils adjacent to bell joint upstream of T-joint	To determine the presence/absence of mercury-impacted soils at bell joint (a potential discharge point)	Tan brown medium sand, moist-wet ¹	0	Mercury
SB06FUDS06-5.0	1-ft below drain-line discharge point at footing wall	To determine the presence/absence of mercury-impacted soils of apparent terminal discharge point of drain-line	Dark grey f-c sand/fine gravel (coal ash-like material), moist	0	TCL VOC, SVOC, Pest/PCB, TAL Metals, TCLP
SB06FUDS07-4.0	4-ft south of drain-line discharge, approximately level with drain-line discharge point	To determine the presence/absence of mercury-impacted soils downgradient of drain-line discharge point	Dark grey f-c sand/fine gravel (coal ash-like material), moist	0	Mercury
SB06FUDS08-4.2	8-ft south of drain-line discharge, approximately level with drain-line discharge point	To determine the presence/absence of mercury-impacted soils downgradient of drain-line discharge point	Dark grey f-c sand/fine gravel (coal ash-like material), moist	0	Mercury
SB06FUDS09-4.4	12-ft south of drain-line discharge, approximately level with drain-line discharge point	To determine the presence/absence of mercury-impacted soils downgradient of drain-line discharge point	Dark grey f-c sand/fine gravel (coal ash-like material), moist	0	Mercury
SB06FUDS10-4.8	Soils in septic tank #1, 4.8-ft below top of tank, just above the shit line, but below where there was evidence of pete the plumber filled it in	To determine the presence/absence of mercury-impacted soils in septic tank #1	Brown f sand/silt, little m-c sand, fine gravel, moist- wet	3.5	Mercury
SB06FUDS11-4.0	Soils in septic tank #2 below where there was evidence of pete the	To determine the presence/absence of mercury-impacted soils in	Brown f sand/silt, moist	0.2	Mercury

Sample ID	Sampling Location	Sampling Rationale	Soil Description	Headspace (ppm)	Analyses
	plumber filled it in	septic tank #2			
SP06FUDS12	Stockpiled soils in 20-yard roll-off container	To characterize soils for soil-disposal purposes	---	---	Mercury, TCLP, RCRA Characteristics
<p>Notes: (1) Soil was wet probably due to the introduction of water to the floor drain and subsequent seepage through the upstream bell joint.</p>					

Photo 1 - Probable End of Drain-line



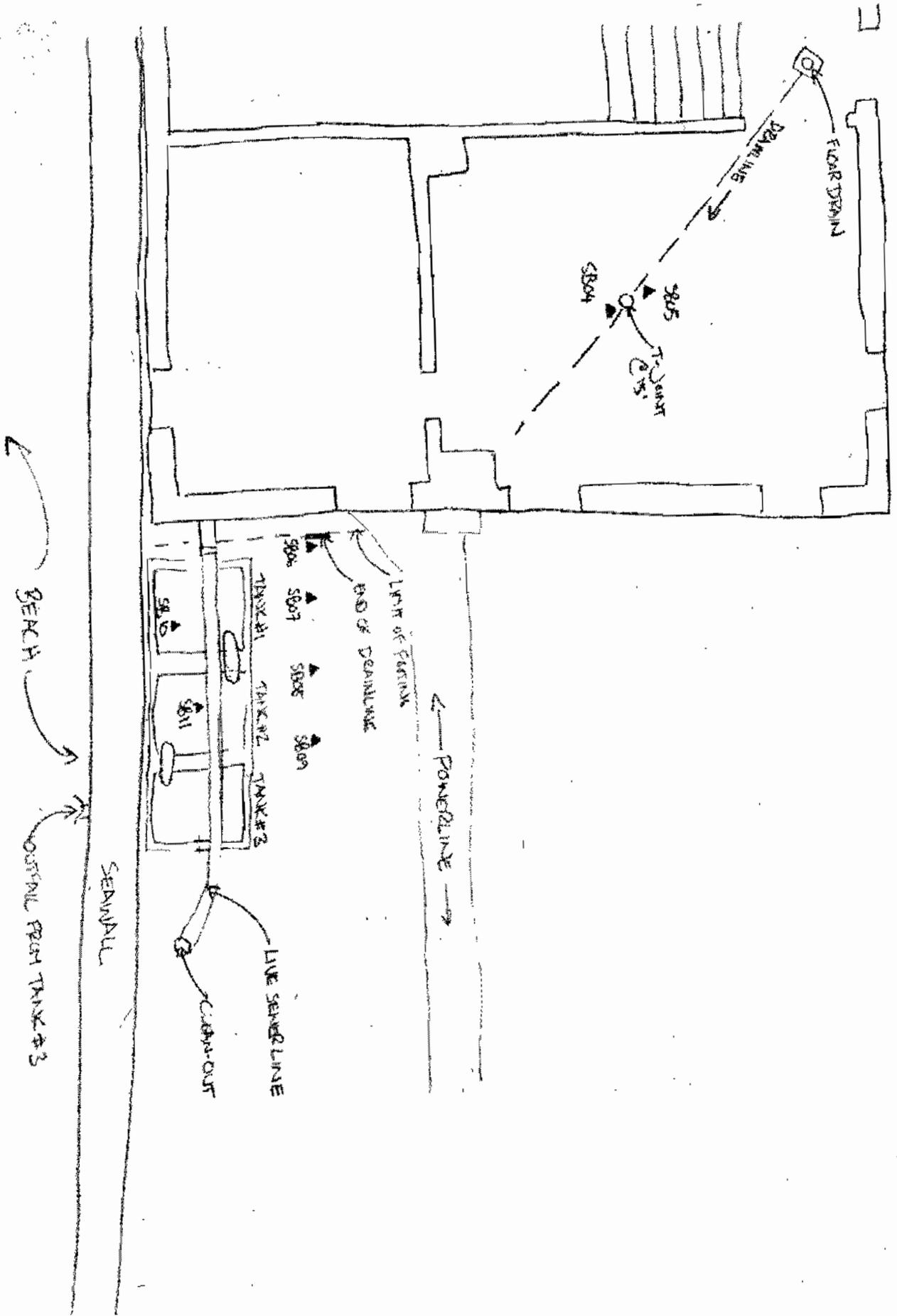


FIGURE 1 - 30-31 OCTOBER 2006



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**EA Engineering, Science,
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EA Project No. 61990.15

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FROM: Daniel Hinckley, Ph.D. –Project Manager, EA

SUBJECT: Field Report and Recommendations, Fort Totten Building 615 Remedial Excavation,
22 March 2007

Introduction

A remedial excavation at Fort Totten, Bayside, Queens was completed on 22 March 2007. Present during the excavation were: James Gatherer (EA), Vernon Griffin (USACE), and Sal Messina and Sean Terry (Terry Contracting). The purpose of the remedial excavation was to excavate and remove impacted soils from a “hot spot” of mercury contamination identified from the results of soil samples collected during the 30-31 October 2006 investigation. The following activities were completed at the site:

- Excavation of Hot Spot
- Post-Excavation Confirmatory Sampling.

Field Activities

Remedial Excavation

Previous investigations identified a hot spot of mercury contamination centered around soil sample locations SB-08 (6.5 mg/kg at 4.2 ft bgs) and SB-09 (25 mg/kg at 4.4 ft bgs) (see Figure 1). Based on the distribution of mercury concentrations and the current location of the drain-line, it is hypothesized that the drain-line extended out from the building footing at the approximate location of sample SB06, and terminated at a point proximate to SB-09.

An additional approximate ten cubic yards of soil was excavated from the hot spot area. The excavation extended laterally west to the three dry wells, east to the buried power line, north to SB-07 and south to SB-02 (Figure 1). Vertically, the excavation extended down to approximately 7-ft bgs. The three cesspools and the buried power line were not disturbed during the excavation. Excavated soils were stored on-site in a lined 20 yard roll-off container pending waste characterization and the determination of the soil disposal location.

Post-Excavation Confirmatory Sampling and Waste Characterization Sampling

Confirmatory composite soil samples were collected from the side walls and bottom of the excavation to assess the presence or absence of residual soil contamination in soils above the water table. One composite soil sample was collected from each sidewall of the excavation where soil is exposed. That is, samples were collected from the north (SB 18), east (SB 17) and south (SB 16) walls of the excavation. The east wall sample (SB 17) was collected from soil beneath the approximately 2-ft depth concrete electrical conduit that extends along the entire length of the east wall. No sample was collected from the west wall since this was the exposed surface of the three brick cesspools (see Figure 1). Also, one composite soil sample was collected from the bottom of the excavation (SB 15). Four grab samples were collected from each sidewall/bottom to form each composite sample. Confirmatory soil samples were analyzed for mercury by EPA Method 7471.



Excavated soils were sampled for waste characterization purposes. Soils were analyzed for mercury, Full TCLP plus RCRA characteristics. Soil disposal options will be determined based on the results of the waste characterization analysis.

Soil sampling procedures were completed in accordance with the Field Sampling Plan and Field Sampling Plan Addendum.

Findings

The table below provides preliminary results from post-excavation confirmatory soil sampling:

Preliminary Mercury Results from Post-Excavation Confirmatory Soil Sampling (mg/kg)		
Sample ID	Sampling Location	Preliminary Result
SB 15	Bottom Excavation	9.8
SB 16	South Wall Excavation	6.6
SB 17	East Wall Excavation	12.2
SB 18	North Wall Excavation	2.0

As shown in the table above, elevated mercury concentrations in soil remain to the north, east, and south of the excavation in addition to the bottom of the excavation.

Waste characterization sampling results are pending.

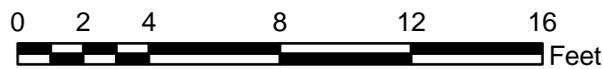
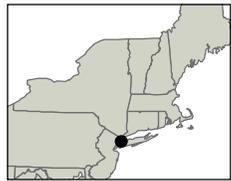
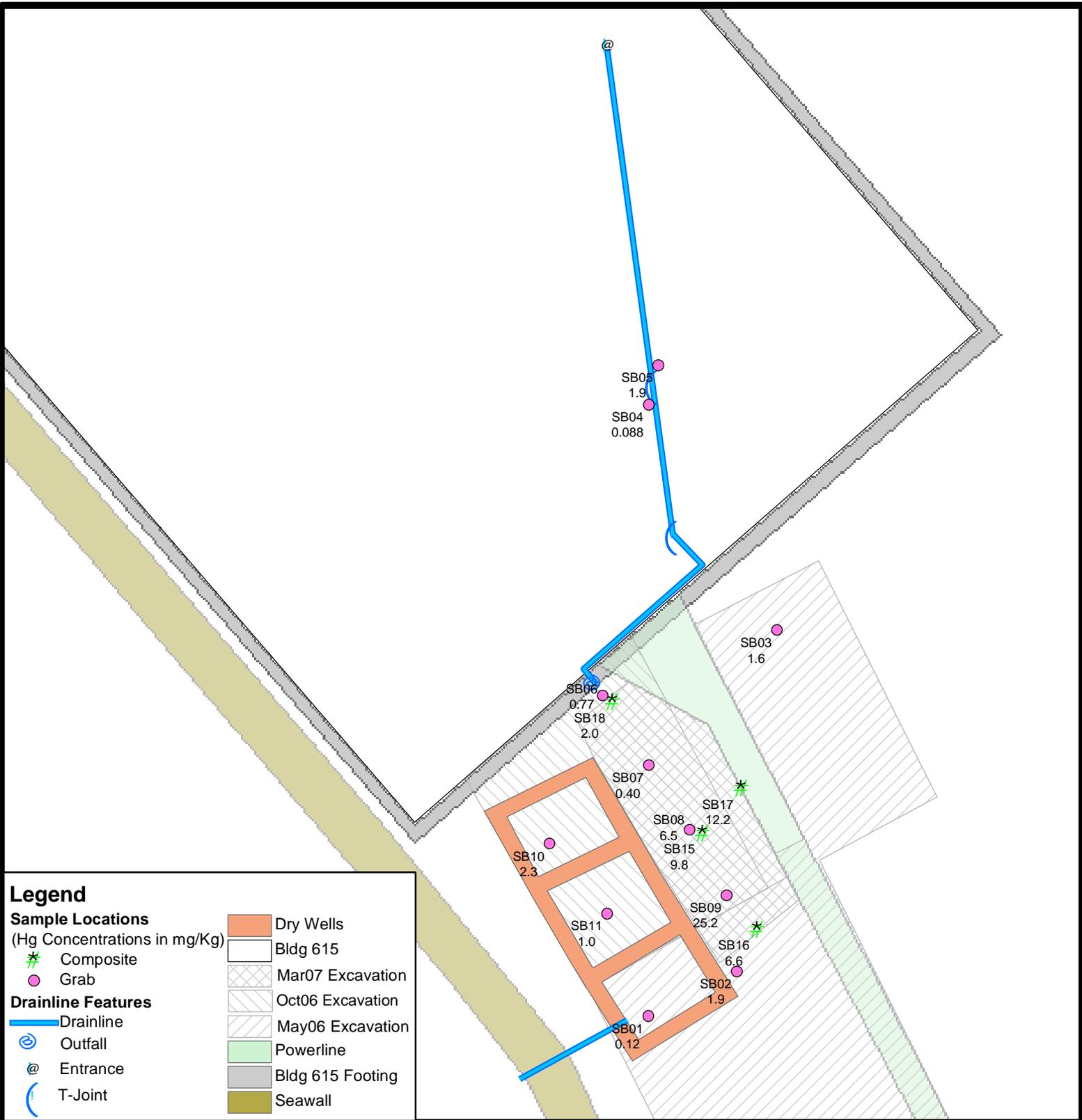
Recommendations

Recommendations for the future actions at this site are predicated on the following points.

- The Region 9 Preliminary Remedial Goal (PRG) for methyl mercury for a industrial worker is 62 mg/kg and the PRG for mercury and compounds (a mixture of inorganic mercury) is 310 mg/kg. The PRGs are significantly larger than measured concentrations at the site, indicating that industrial workers exposed to these soils would have acceptable risk levels. It is important to note that the exposure factors used to derive the PRGs for industrial workers are significantly higher than would ever be expected for subsurface soils covered with asphalt. For example, the exposure scenario for industrial workers assumes exposure to these soils for 250 days/year for 25 years, certainly an exposure that would never be expected for these subsurface soil samples.
- The soils on the east wall of the excavation are supporting a 2 ft x 2 ft concrete high voltage powerline. While it is certainly possible to shore up such a structure during excavation, and replace the mercury containing soils with clean fill, it is possible that significantly greater danger could result from undermining the soils supporting the high voltage powerline.
- There is no evidence that the mercury in the subsurface soil is being transported and released to the environment. Studies of biota in Little Bay conducted in 2006 did not show evidence of releases of mercury to the bay. It is expected that the mercury in the subsurface soil is likely present as insoluble minerals, which would not be expected to solubilize and be released to the environment, either through groundwater release or any other release mechanism.

Given the above factors it is recommended that the site be closed without further excavation. The 10 cubic yards of material excavated on 22 March 2007 will be disposed of as required, based on the results of the waste characterization results. The excavation will be lined with snow fence (as a marker), filled with clean fill material, and covered with asphalt. Finally the relocated AST will be place back in its original location.

The use of a deed restriction limiting digging could be considered to further minimize potential exposure to these soils.



FORMERLY USED DEFENSE SITE
FORT TOTTEN, NEW YORK

FIGURE 1
SITE DETAIL

PROJECT MGR:
DH

DESIGNED BY:
JG

CREATED BY:
JG

CHECKED BY:
DH

SCALE:
AS SHOWN

DATE:
APR 2007

PROJECT NO:
6199015

FILE NO:
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