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STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

ANGUS S. KING, JR.
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COMMISSIONER

March 25, 1996

Mr. Fred Evans
Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

RE: Draft Source Investigation Report Site 9, Neptune Drive Disposal Site, Naval Air Station, Brunswick, Maine

Dear Fred:

The Maine Department of Environmental Protection (MEDEP) has reviewed the Draft Source Investigation Report for Site 9, Neptune Drive Disposal Site. The MEDEP's comments are provided below.

General Comments

Generally the MEDEP agrees with the conclusions of this report. Distribution of chlorinated hydrocarbon groundwater contamination suggests the former ash landfill as a source area. However, the predominance of vinyl chloride in groundwater also suggests the contamination has degraded to a point where locating a source, if one still exists, would be difficult if not impossible. The Eastern Plume groundwater extraction and treatment system is located hydrologically downgradient of Site 9 limiting the potential for migration of contaminated groundwater to off-site receptors. Continued monitoring of groundwater and surface water is necessary to document trends and assess future potential impacts from the Site.

One of MEDEP's concerns is the future use of groundwater at Site 9. A decision should be made by the MEDEP, EPA, Navy, and RAB regarding future groundwater use at Site 9 and NASB in general. Decisions regarding appropriate cleanup levels of contamination are dependent on what controls are place on future use scenarios.

Specific Comments

1.) 2.3 Summary of Site Characteristics, Page 2-6, Para 3, Page 2-7, Para 1

"The top of clay has been interpreted from boring logs to range from a depth of about 20 feet bgs on the southern edge of the site, to 48 feet bgs in the center of the site, to 7 feet bgs in the vicinity of the NEX service station."

Geologic cross sections of overburden materials at Site 9 from previous RI/FS reports[1,2] are provided as an attachment to this memo. Cross section D-D' indicates glaciomarine clay deposits outcrop in the vicinity of the unnamed stream in the southeastern portion of the site. Cross section A-A' and B-B' show transition overburden materials (fine sand/silt) increasing in depth to the north and west, respectively. These cross sections suggest a northwesterly slopping confining layer at the base of the aquifer beneath Site 9. Increased depth of the transition zone beneath the western portion of the unnamed stream provides the potential for migration of contamination beneath the stream as was observed in MW-909. Aquifer characteristics should be considered along interpreted groundwater flow paths and perpendicular to the flow path when assessing potential contaminant transport.

2.) Table 3-1, Summary of Explorations, Page 3-3

The Comment for HSA Test Boring/Monitoring Well TB(MW)-NASB-021 indicated "Well screened at 42.5 - 47.5 feet bgs."

The Source Investigation Sampling and Analysis Plan (SAP)[3] indicated this monitoring well would be screened "at a depth below 16 feet with highest PI." The highest PI reading reported with the boring log for MW-NASB-021 was 38 ppm at 16 to 18 feet bgs. The well screen for MW-915 extents to 17 feet bgs. The MEDEP understands the intention of the installation of MW-NASB-021 was to assess DNAPL contamination of groundwater above the clay layer and agrees the placement of the well screen was appropriate.

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[1] E.C. Jordan, Remedial Investigation Feasibility Study Round I Data Package, Contract: N62472-84-C-1108, January 1989

[2] E.C. Jordan, Remedial Investigation Feasibility Study Round IV Data Package, Contract: N62472-84-C-1108, January 1990

[3] ABB Environmental Services, Source Investigation Sampling and Analysis Plan, Site 9 Neptune Drive Disposal Site, January 1995.

3.) 3.2 Soil Borings and Sampling, Page 3-8, Para 1

"This determination was based on photoionization detector (PID) readings from the headspace of the reference sample."

Documentation of PID headspace field methodology should be provided including, at a minimum; PID model, calibration method, and set points. Please either provide this information in this section or reference the section in the report where it is provided

4.) 3.3 Monitoring Well Installation, Page 3-9, Para 5

"MW-NASB-204 (changed from the designation of MW-NASB-023 as described in the SAP) located west of Building 212..."

Explain why this designation was changed. The well designation MW-NASB-204 is out of sequence with designations for other wells installed as part of this phase of work and may cause confusion in the future.

5.) 3.5 Groundwater Sampling, Page 3-14, Para 1

"It was observed in using the low-flow purging and sampling technique that the amount of pumping time combined with the small volumes of water flowing through the submersible pumps caused the pumps to become heated and resulted in the recording of elevated water temperatures (Appendix D)."

Groundwater Sample Field Data Record sheets provided in Appendix D show variability in temperature increases recorded during low-flow purging of monitoring wells. Sequential temperature measurements indicated a range of temperature changes from a 0.1°C decrease for MW-906 to an approximately 5°C increase for MW-916. Additional thought is required to assess why this variability in temperature measurement occurred and which samples may have been compromised due to significant increases in temperature. Quarterly monitoring low-flow field measurements performed by EA should be assessed to see if similar changes in temperature have occurred for previous sampling rounds.

6.) 4.2 Data Quality Objectives (DQOs), Page 4-10, Paras 2 & 3

"• Low level vinyl chloride analysis were performed using a low level method by gas chromatograph/mass spectrometer (GC/MS) using the selective ion monitoring method. These results are sufficient to support Level C data quality.

• Fuel oil and gasoline in soil and water were analyzed using laboratory protocols sufficient to support Level C data quality."

The MEDEP does not disagree with the DQOs presented above. However, Tables 4-1 and 4-2 in the SAP[4] indicate these methods would be assessed using Level D CLP laboratory data protocols.

7.) 4.2 Data Quality Objectives (DQOs), Page 4-10, Paras 3

"Samples analyzed for TPH as gasoline employ a GC/FID method based on the leaking underground fuel tank method for soil,..."

Table 4-1 indicates this method to be MEDEP 4.2.3. The text should be revised.

8.) 5.1 Soil Borings, Page 5-4, Para 1

"Because water was observed at this depth and the PID reading was elevated (which appears to be a false-positive; (see Table 5-1),..."

The boring log for TB(MW)-NASB-020 provided in Appendix A indicates the elevated PID reading was reported for a screening measurement of the split spoon which would not be as accurate a result as headspace screening. The headspace screening result was non-detect. A note with the boring log indicated the false positive reading may have resulted from switching the PID off and on again. This information should be stated in the text of the report.

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[4] ABB Environmental Services, Source Investigation Sampling and Analysis Plan, Site 9 Neptune Drive Disposal Site, January 1995.

9.) 5.1 Soil Borings, Page 5-6, Para 3

"Background values for SVOC compounds have not been formally established in soils at NAS Brunswick. Therefore, literature values for background concentrations for SVOCs may be consulted. Table 5-2 presented a compilation of background values for PAHs associated with rural, agricultural, and urban soils."

Please explain why background values for SVOCs were not assessed at BNAS?

Background values presented in Table 5-2 vary as much as 5 orders of magnitude (pyrene). It is difficult for the reviewer to determine which background values are appropriate for comparison to subsurface soil at BNAS. This issue should be discussed with MEDEP, EPA, Navy and RAB.

10.) 5.1 Soil Borings, Page 5-11, Para 2

"The fact that there are TPH detections for gasoline but no VOC detections reported for TB-917 may be explained by noting that the VOC analysis for this soil sample was diluted by a factor of 125 times normal, which may have caused the volatiles to be diluted out of the results."

Explain why the VOC sample was diluted by a factor of 125 times normal. This statement suggests the VOC sample was not appropriately handled by the analytical laboratory. Sample dilution should not cause the elimination of the compounds under investigation. Were other samples similarly diluted?

11.) 5.1 Soil Borings, Page 5-12, Para 2

"Baseline Cleanup Goals are appropriate if the area is considered a non-attainment zone, defined as an area from which groundwater will not be withdrawn for human use because of environmental and/or institutional factors. The Navy believes the area around Site 9 and the NEX meets the MEDEP criteria for a non-attainment zone and, therefore, the observed TPH values do not indicate a need for remedial action."

The MEDEP recommends that the Navy, EPA, MEDEP, and RAB discuss the issue of the future use of groundwater at Site 9 and the NEX Service Station area.

12.) 5.1 Soil Borings, Page 5-12, Para 3

"Included in this table [Table 5-3] are the background inorganic sand values for samples collected from locations throughout NAS Brunswick. Some inorganics are occasionally detected at concentrations above base background, but below cleanup levels established for other sites on base. Overall, inorganic contamination of concern was not observed in soil borings."

Please identify the soil cleanup levels established for other sites on base used for comparison to Site 9 inorganic parameters. A quick review of Table 5-3 indicated approximately 30% of the reported values exceeded background inorganic sand values for NAS Brunswick. Please provide further justification for the statement "inorganic contamination of concern was not observed in soil borings."

13.) 5.2 Test Pit Soils, Page 5-17, Para 2

"Results of the test pit samples for organic analyses are shown in Table 5-1. These results indicate that organic contaminants of concern are not present in test pit soils."

Bis(2-ethylhexyl)phthalate was detected in TP-914 at 48J µg/kg. Detections of 4,4'-DDE, 4,4'-DDT, and methoxychlor were reported for TP-915 at values ranging from 0.4J to 3.9J µg/kg. The MEDEP agrees these concentrations do not present a concern.

14.) 5.3 Groundwater, Page 5-24, Para 1

"Presumably, samples collected using the low-flow technique would show higher levels of vinyl chloride, or levels more representative of natural in-situ conditions. As shown in Table 5-6, the detections for vinyl chloride are essentially the same regardless of the sampling method. This indicates that either the low-flow sampling method is no more effective in detecting low concentrations of vinyl chloride, contamination is being naturally attenuated over time, or a combination of these two possibilities exists."

The use of low-flow sampling techniques provides consistency for sampling protocols over time. Data presented in Table 5-6 do not show significant variance in vinyl chloride concentrations between low-flow and bailing sampling methods. Assessment of vinyl chloride data for samples collected using conventional sampling methods is difficult due to the frequency of not analyzed (NA) and not sampled (NS) occurrences for sampling events. The repeatability of data since 3/95, when low-flow sampling was initiated, supports using this sampling technique.

The effect of elevated groundwater temperatures caused by submersible pumps should be assessed. See Comment 5

15.) 5.3 Groundwater, Page 5-27, Para 2

"Samples collected in this investigation were collected using low-flow techniques and results show comparable or higher concentrations to those collected using conventional methods. One example is the results from MW-915, compared in Table 5-10, which show a similar distribution of inorganic compounds occurring regardless of the sampling method."

Text in the report did not indicate whether "conventional" sample results were reported for filtered or unfiltered samples. A quick review of the Final Technical Memorandum for Site 9[5] by the reviewer also did not identify this information. Comparison of low-flow to conventional sampling techniques must include both filtered and unfiltered results for the conventional samples. Base cations (Ca, Na, Mg, K) are dominant aqueous species which are less likely to be affected by sampling technique. Similar concentrations for these cations reported in Table 5-10 support this conclusion. Cations such as Fe and Mn exist in solid and aqueous phases which are very sensitive to pH and redox conditions. It is interesting to see significant reduction in the concentration of Fe and Mn from conventional to low-flow sampling. Trace cations such as Cr, Co, Pb, Ni, and V were not reported for the 3/93 sampling results. These cations may have been removed from the sample by filtering. Detection of these cations using low flow techniques may indicate colloidal transport within the aquifer.

16.) 6.0 Summary and Conclusions, Page 6-1, Para 2

"Results of previous investigations at this site have identified groundwater contaminants present at concentrations greater than drinking water standards; however, no current source area(s) of contamination had been identified."

As indicated later in Section 6.0, configuration of vinyl chloride detections in monitoring wells suggest the source may be the former ash landfill. The predominance of vinyl chloride over other chlorinated solvents also suggests the contaminant source has degraded significantly over time and may be difficult to locate within the landfill.

17.) 6.0 Summary and Conclusions, Page 6-2, Para 2

"These concentrations are below the MEDEP Baseline Clean-up Goals for oil contaminated soil and no further action is recommended."

See Comment 11.)

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[5]ABB Environmental Services, Final Technical Memorandum, Site 9 Neptune Drive Disposal Site, May 1994.

18.) 6.0 Summary and Conclusions. Page 6-4

Will any of the wells installed for this investigation be added to the long term monitoring program?

If you have any questions, please call me at 207-287-7713. Thank you.

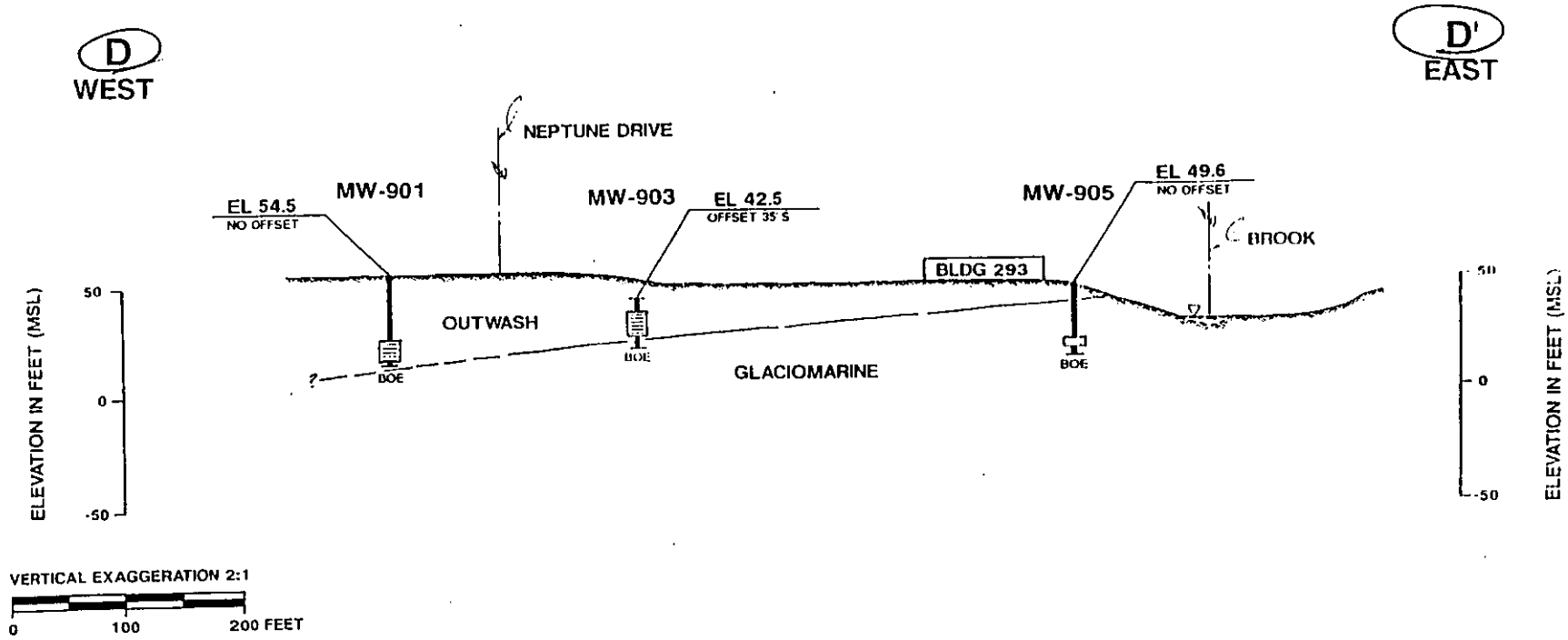
Sincerely,

Nancy Beardsley

Nancy Beardsley
Project Manager, Division of Remediation
Bureau of Remediation and Waste Management

attachment: geologic cross-sections

pc: Robert Lim, USEPA
Jim Caruthers, NAS Brunswick
Carolyn Lepage, Lepage Environmental
Jeff Brandow, ABB ES
Rene Bernier, Topsham
Tom Fusco, Brunswick
Susan Weddle, Brunswick
Ken Finklestein, NOAA
David Gleason, Brunswick
Richard Sobocinski, Brunswick
James Macleod, Brunswick
Topsham Water District
Steven Mierzykowski, USFW
Mark Hyland, MEDEP
Richard Heath, MEDEP
Marianne Hubert, MEDEP



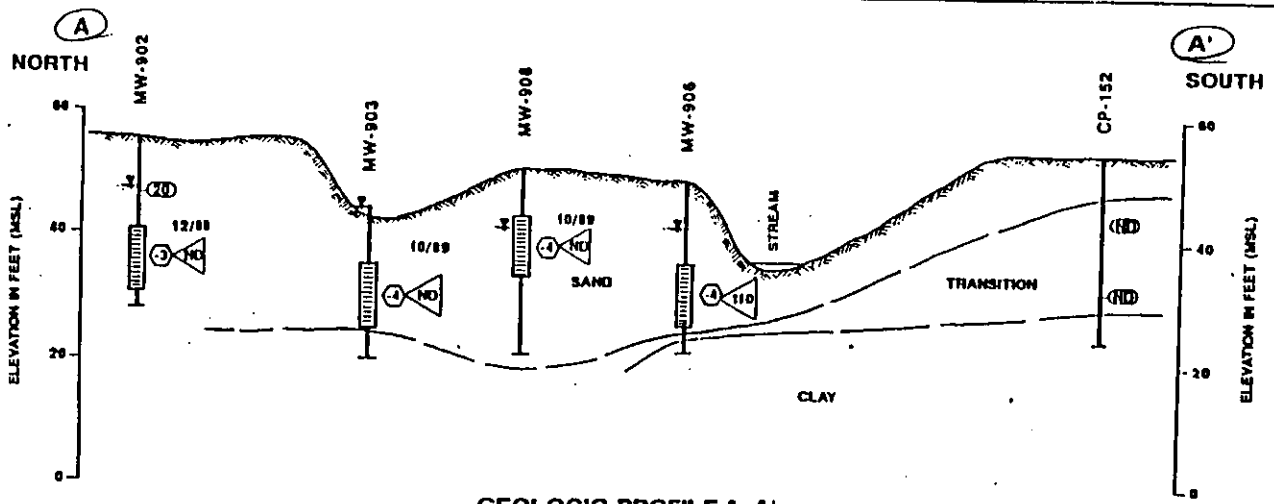
LEGEND

MW-101	MONITORING WELL
	GROUND SURFACE
	WELL SCREEN
BOE	BOTTOM OF EXPLORATION

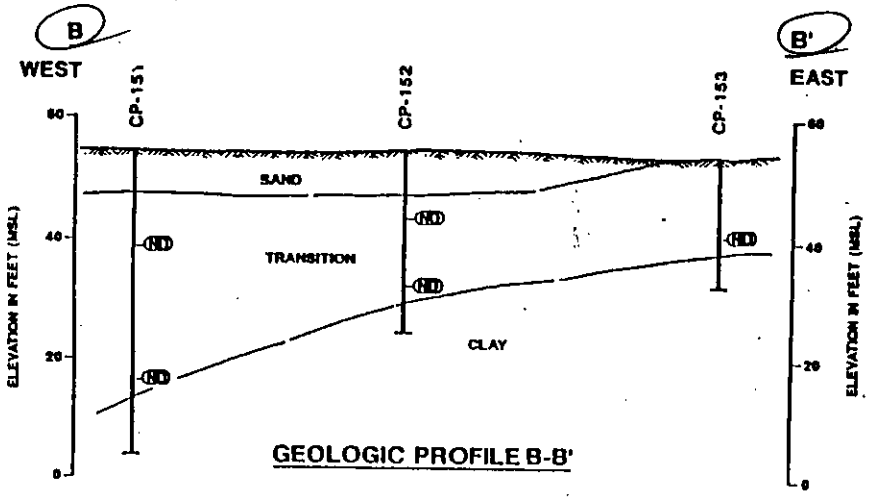
NOTE: PROFILES ARE BASED ON AN INTERPRETATION OF AVAILABLE SUBSURFACE EXPLORATIONS. ACTUAL CONDITIONS BETWEEN EXPLORATIONS MAY VARY FROM THOSE SHOWN.

E.C. JORDAN CO. CONSULTING ENGINEERS	GEOLOGIC PROFILE D-D' SITE 9
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	RI/FS PROGRAM
4607-14	FIGURE 57

Jan 89



GEOLOGIC PROFILE A-A'



GEOLOGIC PROFILE B-B'

SCALE IN FEET
0 100 200
VERTICAL EXAGGERATION 5:1

LEGEND

- MONITORING WELL, PIEZOMETER OR CONE PENETROMETER BORING LOCATION
- GROUND SURFACE
- WATER LEVEL (11/20-21/90)
- WELL SCREEN
- BOTTOM OF EXPLORATION
- (20) LOCATION OF WATER SAMPLE AND TOTAL VOCs IN FIELD SCREENING (ug/L)
- (110) TOTAL VOCs DETECTED IN CLP ANALYSIS OF WELL WATER (ug/L) (NOV. 1990 DATA UNLESS OTHERWISE NOTED)

NOTES:

1. PROFILES BASED ON AN INTERPRETATION OF AVAILABLE SUBSURFACE EXPLORATIONS. ACTUAL CONDITIONS BETWEEN EXPLORATIONS MAY VARY FROM THOSE SHOWN.
2. (-3) ORDER OF MAGNITUDE OF HYDRAULIC CONDUCTIVITY IN CENTIMETERS/SECOND (i.e., 10^{-4} cm/sec.)
3. LOCATION OF PROFILE SHOWN ON FIGURE 7-1.

GEOLOGIC DESCRIPTIONS:

SAND - TAN TO LIGHT BROWN FINE SAND, TRACE TO LITTLE MEDIUM SAND, TRACE SILT, POORLY GRADED, LOOSE TO MEDIUM DENSE, DRY TO SATURATED, SLIGHTLY STRATIFIED WITH DEPTH.

TRANSITION - BROWN TO GRAY FINE SAND AND SILTY, FINE SAND, TRACE CLAY, STRATIFIED WITH SILT AND CLAY LENSES, POORLY GRADED, NON TO SLIGHTLY PLASTIC, SOFT IN PLACES, SATURATED.

CLAY - GRAY, SILTY CLAY TO CLAYEY SILT (ROCK FLOUR), MEDIUM TO HIGH PLASTICITY, VERY SOFT, SATURATED.

Drawn By: CWJ	Date: 4/91
Checked By: JZ	Date: 4/91

EC JORDAN CO. CONSULTING ENGINEERS	GEOLOGIC PROFILES A-A' AND B-B' AND VOC GROUNDWATER DATA SITE 9
INSTALLATION RESTORATION PROGRAM NAVAL AIR STATION BRUNSWICK, MAINE	RI/FS PROGRAM
4007-55	FIGURE 7-2

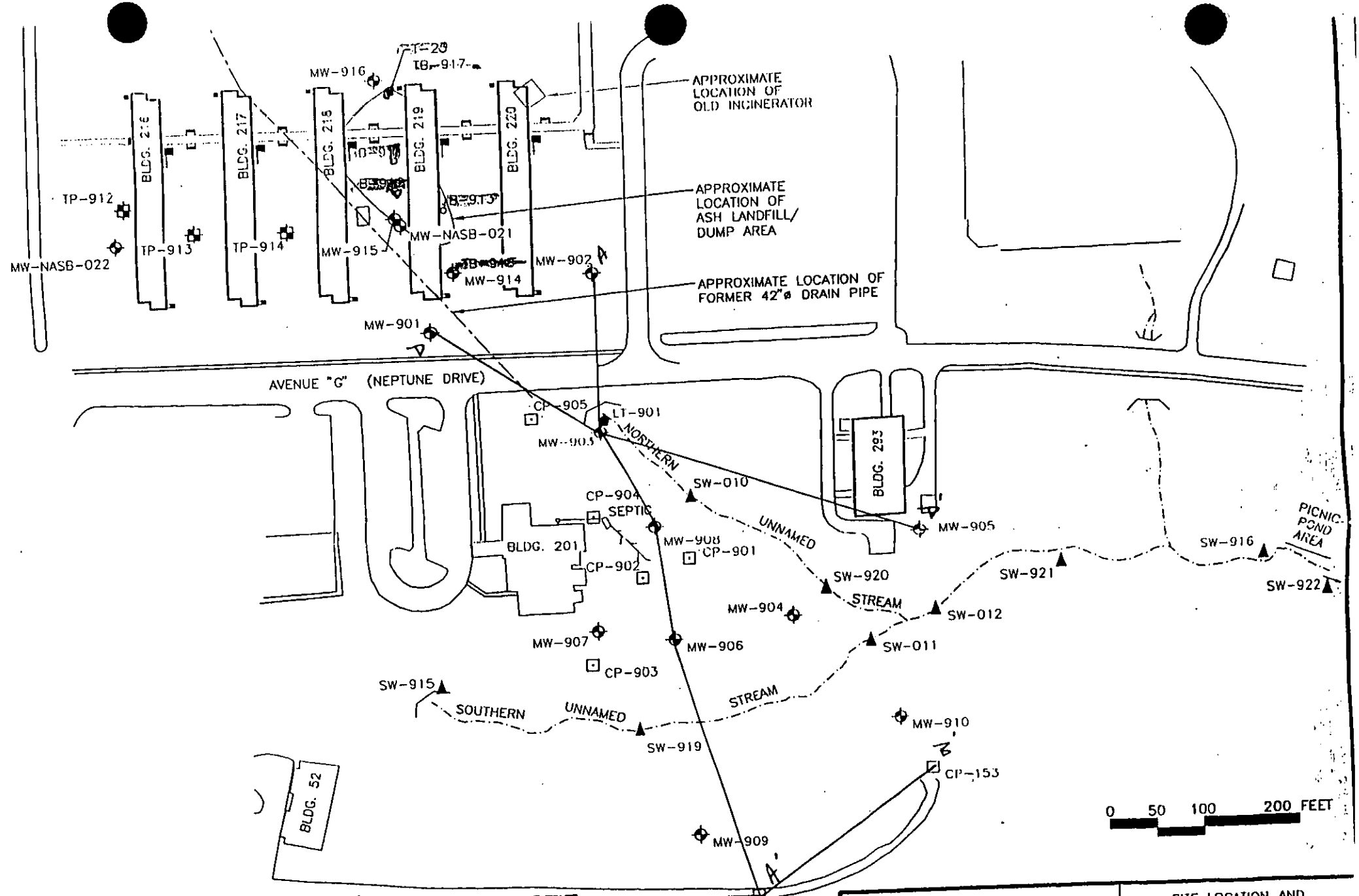


ABB Environmental Services, Inc.

INSTALLATION RESTORATION PROGRAM
NAVAL AIR STATION
BRUNSWICK, MAINE

SITE LOCATION AND EXPLORATION MAP: SITE 9

SOURCE INVESTIGATION

JOB NO. 8733-09

FIGURE 3-1