N00174.AR.000619
NSWC INDIAN HEAD
5090.3a

LETTER FROM U S NAVY REGARDING LEAD CONTAMINATION AT INSTALLATION RESTORATION SITE 8 NSWC INDIAN HEAD MD
11/30/1993
NSWC INDIAN HEAD

536

DEPARTMENT OF THE NAVY
INDIAN HEAD DIVISION
NAVAL SURFACE WARFARE CENTER
101 STRAUSS AVE
INDIAN HEAD MD 20640-5035

5090
Ser 0952/643
30 Nov 93

From: Commander, Indian Head Division, Naval Surface Warfare Center
To: Commander, Chesapeake Activity, Naval Facilities Engineering Command, Code 181, Washington Navy Yard, 901 M Street, Washington, DC 20374-2121

Subj: LEAD CONTAMINATION AT IR SITE 8

Ref: (a) CHESNAVFACENGCOM (S. Phillips) Site Visit of 23 Sep 93
(b) Site Characterization Report for Site 8 - Nitroglycerin Plant Office of Jan 93
(c) Navy/Marine Corps Installation Restoration Manual of Feb 1992, Page 3-4, Section 3.1.2

Encl: (1) Drawing of Building 790 Water Discharge Collection Sump and Drainage to IW87 Via the Sump
(2) IHDIVNAVSURFWARCEN memo 5090 Ser 0951/137/ab of 19 Aug 93

1. As discussed during reference (a), we have been exceeding the lead limit at Industrial Wastewater (IW) Outfall IW87. The limit for lead at IW87, which became effective in June 1992, is 0.082 milligram per liter (mg/l) as prescribed in our National Pollutant Discharge Elimination System (NPDES) permit. The requirement to sample for lead at IW87 began in 1988 when we discovered that lead was leaching from the lead-lined flooring in Building 790. The lead lining provides a conductive floor surface, as required in OP-5, for explosives operating buildings.

2. Building 790 is used for the storage of spent nitric and sulfuric acid from the production of nitrate esters. Fumes from these acids get on the walls and floor of the inside of the building, requiring a periodic washdown of the walls and floor. The acid dissolves the lead in the flooring, and the washdown provides a route for the dissolved lead to discharge to IW87.

3. The drain from the building, which leads to a pit outside the building, and ultimately to IW87, was sealed in October 1992 when we began exceeding the lead limit at IW87 on a regular basis. However, our recent NPDES exceptions reveal a problem with the drainage area from the building, since there is no longer a source of lead to the outfall from any operation or building. Enclosure (1) shows the pipes that enter the pit and provides a brief description of their sources.

4. Enclosure (2) provides a description and the locations of samples taken by IHDIVNAVSURFWARCEN personnel to date. Based on the sample results, we can see that the lead has settled in the sediment in the pit outside of Building 790. In addition, we feel that the lead has settled in the 24-inch terra cotta pipe which flows to IW87. The pipe is the old bell and joint type, which is most likely cracked, providing settling areas for the lead. In addition, the end of the pipe is at least half full of sediment.

5. You will also note from reference (b) that a sample taken in the tidal pond downstream from IW87 resulted in a lead concentration of 442 parts per million (ppm). A test for lead using the Toxicity Characteristic Leaching Procedure (TCLP) revealed that the lead in the tidal pond is not leaching. However, the most recent grab water sample taken at IW87 had a lead concentration of 0.275 mg/l. The sediment was not disturbed at all during this grab sample.

6. Attempting to remove the requirement to sample for lead at IW87 from our NPDES permit is not feasible, since we know a problem exists. In addition, at least one year would be required to modify the permit if the Maryland Department of the Environment (MDE) even allowed us to do so. However, attempts in the past to remove sampling parameters from outfalls have resulted in the MDE quoting the Clean Water Act Section 402(o), Anti-backsliding policy. This policy will not allow us to modify our permit with less stringent limitations than the previous permit.

7. In addition, we must submit monthly and quarterly Discharge Monitoring Reports (DMR) to the MDE which show our sampling results, including these violations. Under Title 40 Code of Federal Regulations Part 123, Section 45, the MDE must forward a Quarterly Non-Compliance Report (QNCR) to the Environmental Protection Agency. The QNCR contains the names of facilities that violate their NPDES permit by exceeding the monthly average permit limits in any four months out of a six-month period. In the past four months, we have exceeded our monthly limit for lead at IW87 four times. Unfortunately, we do not foresee a change in this current trend.

Subj: LEAD CONTAMINATION AT IR SITE 8

8. Therefore, we request that you include the pit and piping from Building 790 to Outfall IW87 in the Installation Restoration program at our Activity. We will be taking a TCLP sample of the sediment to determine if lead is leaching from this sediment. If the lead is leaching, we will inform you and request that you perform an Emergency Removal at this site as described in reference (c).

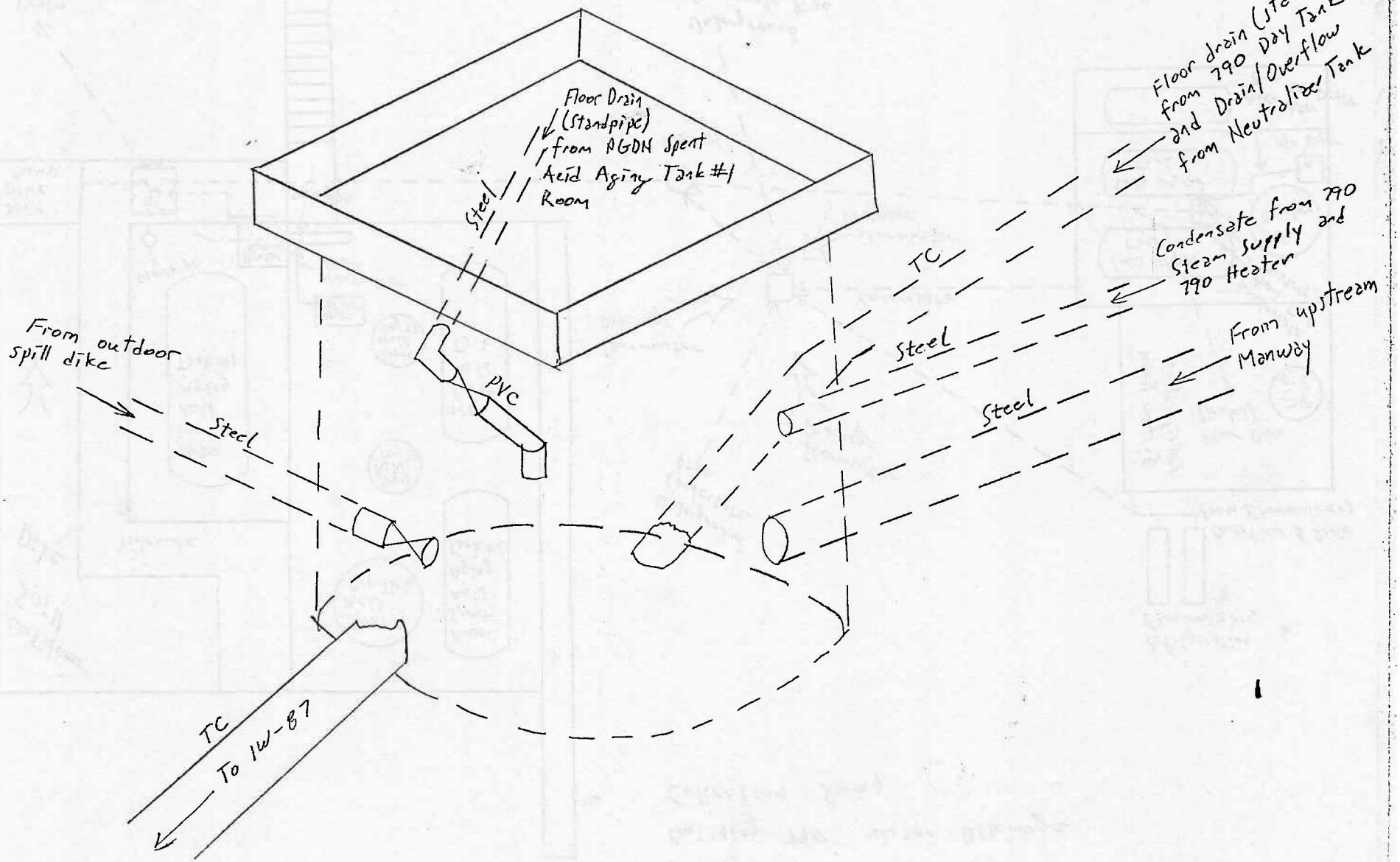
9. If you have any questions concerning this matter, please contact Shawn Jorgensen on (301) 743-6745 or DSN 354-6745.

Susan P. Adams

SUSAN P. ADAMS
By direction

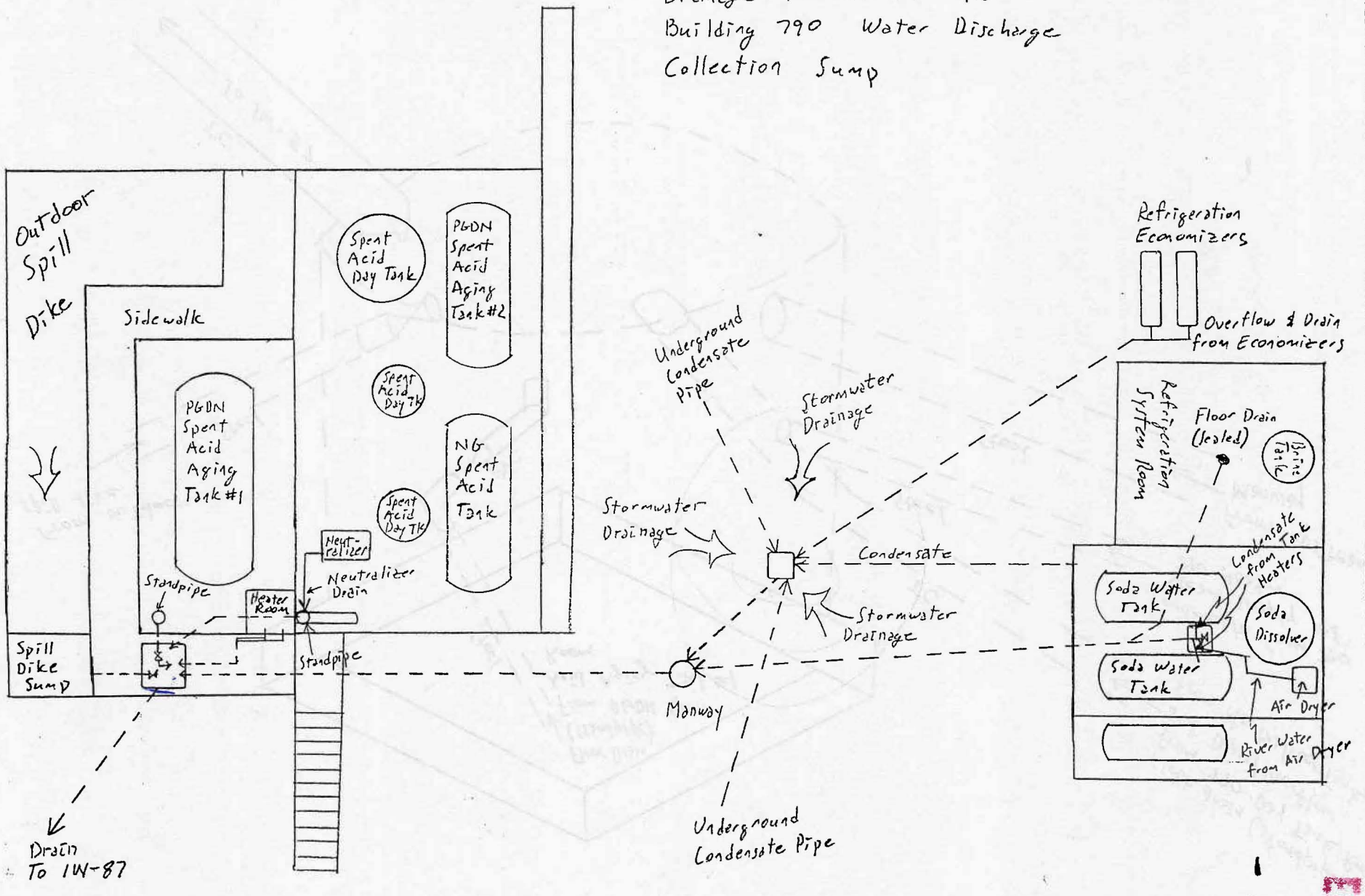
Copy to:
MDE (K. Lemaster)
MDE (J. Beazley)

Building 790 Water Discharge
Collection Sump

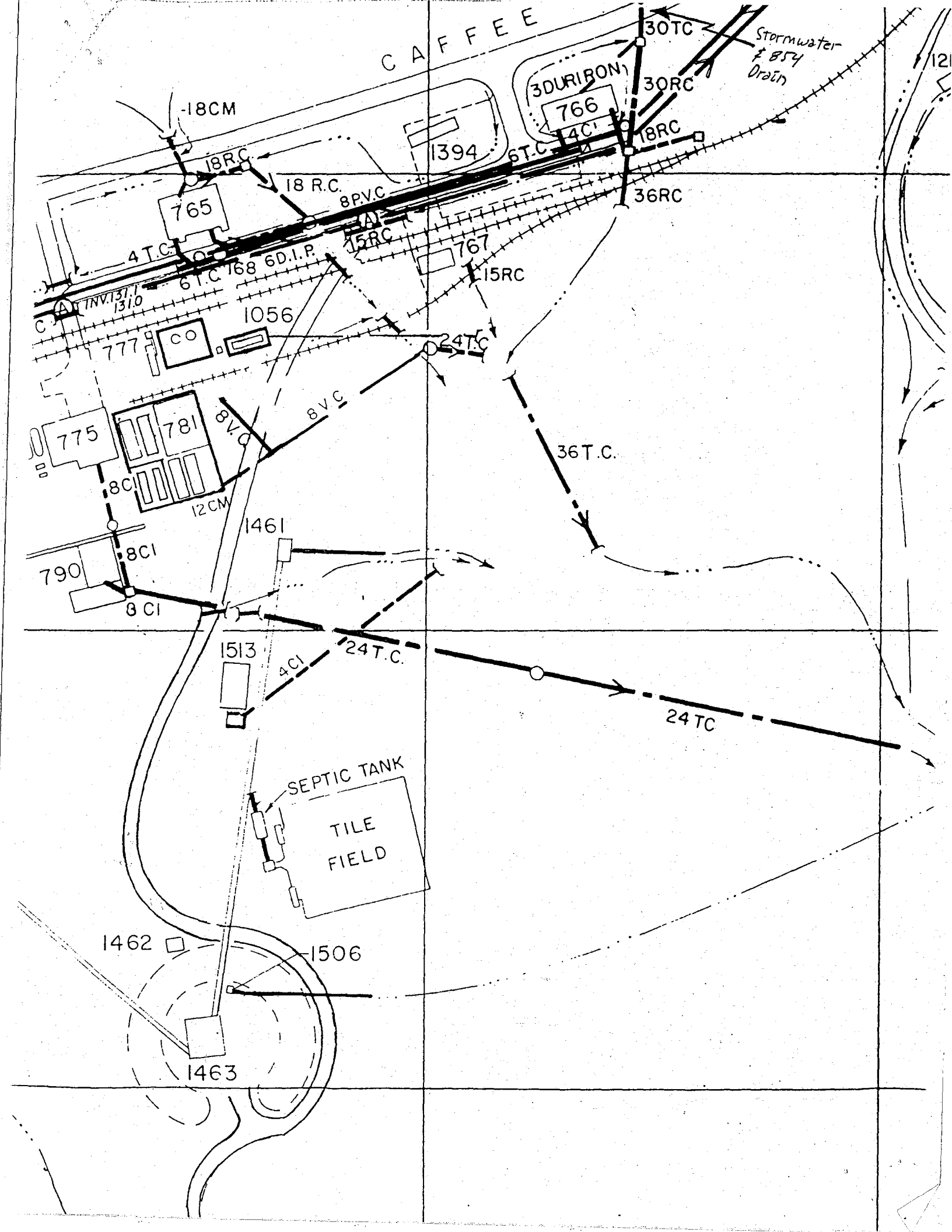


ENCLOSURE (1)

Drainage to IW-87 via
Building 790 Water Discharge
Collection Sump



ENCLOSURE( )


CAFFEE
30TC
Stormwater & 854 Drain
3DURIRON
30RC
766
4C
18RC
-18CM
18RC
1394
6T.C
18 R.C.
765
8P.V.C
36RC
15RC
767
4 T.C.
6D.I.P.
168
6T.C
15RC
INV.131.1
131.0
1056
777
24T.C
8 V.C
8 V.C
775
781
36T.C.
8C
12CM
1461
790
8C1
8 C1
1513
4C1
24T.C.
24TC
SEPTIC TANK
TILE FIELD
1462
1506
1463

5090
Ser 0951/137/ab
19 Aug 93

MEMORANDUM

From: 0951A
0951C
To: 095
Via: 0951 MD

Subj: FINDINGS OF LEAD CONTAMINATION AT BUILDING 790 AND OUTFALL IW 87

Encl: (1) Map Showing Drainage from Building 790 to IW 87
(2) Chart of Soil and Wastewater Sample Analyses

1. BACKGROUND

Due to another lead noncompliance at IW 87 during routine National Pollution Discharge Elimination System (NPDES) monitoring on 02 Jun 93, a study was commenced on 27 Jul 93 to determine the source. The maximum lead limit is **0.082 mg/l.** On 02 June, the lead analysis was 0.085 mg/l. Two additional noncompliances occurred on 21 July and 04 August. The lead analyses were 0.401 mg/l and 0.0924 mg/l, respectively.

We focused on Building 790 as it is the only structure that drains to IW 87 with lead-lined floors. The problem is compounded by the fact that Building 790 houses acid storage tanks from which occur spills and give off vapor emissions. In response to a July 1992 noncompliance (0.098 mg/l) and a September 1992 special sample directly from the lead flooring (296 mg/l), the drain in 790 was sealed in October 1992 to prevent any further lead-contaminated discharges to the outfall.

Other sources of wastewater to IW 87 include Buildings 775, 781, 1462, 1463, 1699, and 1513. These sources have been temporarily ruled out as a source of the problem since they do not contain any lead floors and lead is not used in any processes.

The drainage system from 790 consists of a pit constructed of concrete and brick which is in need of repair. The concrete floor is nonexistent and consists at this time of a sandy soil. The conduit to the outfall is a 24" terra cotta pipe of the bell-and-joint type. Where the top of the pipe is exposed above the outfall, the joints are not tight allowing surface water intrusion or other debris to enter. The pipe is filled with sediment approximately 75% of its diameter at its terminal point. From 790 the pipe is approximately 900' long and exits into a wet-weather stream which then flows into a swampy area mixing

ENCLOSURE(2)

with other discharges from the LOVA and Extrusion Plants before entering the Mattawoman Creek. Another pipe (6" diameter) discharges from Building 775 into the pit at 790. It contains noncontact cooling water, floor washings, and possibly groundwater. Wastewater from this pipe was analyzed for for lead on 04 Aug 93, and was negative.

2. **METHODOLOGY**

All samples were analyzed by Chesapeake Laboratory. A number of soil/sediment and wastewater samples were collected during this study. All soil and wastewater samples were analyzed using EPA method #239.1 with the exception of the monthly sample taken on 03 August; EPA method 239.2 was used for that (lead) analysis. Soil samples were taken to a depth of 12". Results of analyses are shown in enclosure (2).

3. **27-28 Jul 93 SAMPLING**

On 27 July, the pit was dyed at 790 and a hose placed in the pit to speed the dye on its way to the outfall. The wastewater in the bottom of the pit was sampled for lead and had lead a level of 4.43 mg/l. When the dye-colored wastewater exited the pipe above IW 87 and flowed past the sampling point, a grab[1] sample for lead analysis was collected (where the outfall is posted and is known in this study as sampling point "B").

A composite[2] sample was also taken at "B" on 28 July to coincide with the production of OTTO Fuel. The sampler was reset to run again the night of 28 July for a non-operational run and used as a check against OTTO Fuel production discharges.

On 27 and 28 July, four soil samples were also collected for lead analysis. Two samples were collected in the end of the terra cotta pipe (sampling point "A") and the other two at the outfall (sampling point "B"). "B" is approximately 50' downstream from "A".

---

1. A grab sample is taken within a 15 minute period, usually without the aid of mechanical equipment.

2. A composite sampler collects a sample mechanically and automatically over a period of several hours, usually the length of a work shift.

ENCLOSURE ( )

4. **03-04 Aug 93 SAMPLING**

On 03 and 04 August we resampled the soil at "A" and "B" for lead. A third soil sample ("C") was collected on 04 August from the adjoining stream (IW 86) at the outfall as a background sample.

A composite sample was collected on 03 August which coincided with OTTO Fuel production. A nonoperational composite sample was collected on 04 August and used as a check against the OTTO Fuel production discharges. On 04 August, we also resampled the wastewater at the bottom of the pit at 790 with a lead level of 0.822 mg/l.

4. **13 AND 16 AUG 93 SAMPLING**

On 13 August a soil sample was collected from the bottom of the pit at Building 790 and had a lead level of 18,200 mg/kg. A soil sample was collected from the pit (where the sump wastewater discharges) at Building 1463 on 16 August and had a lead level of 14 mg/kg. A grab sample of wastewater was collected at the same time directly from the pipe from the sump pit at Building 1463 and had a lead level of <0.100 mg/l.

5. **CONCLUSIONS**

From the analysis we have received, we know that there is lead in the pit and in the soil at 790 . Lead is not being discharged from the drain reported to be from 775 due to the negative lab analysis.

We know that lead is present in the soil sediment at the pit at 790 and "A" and "B". The highest values of lead were found in the pit at 790 with over 18,000 mg/kg and at the end of the discharge pipe (sampling point "A") with over 2,000 mg/kg.

We know that the wastewater sample collected from the sump at Building 1463 is negative (<0.100 mg/l). The soil sample from the pit at 1463 should also be considered negative (14 mg/kg).

All composite and grab wastewater samples, with the exception of the 04 August sample at "B" and the 16 August samples at 1463, contained lead in excess of our NPDES parameter of 0.082 mg/l.

All sampling tubes used on 21 July and in this study were analyzed for lead contamination after use and were negative (less than the detectable limit). One tube was tested before using and was negative. This effectively eliminates the equipment as a source of the lead contamination.

Subj: FINDINGS OF LEAD CONTAMINATION AT BUILDING 790 AND OUTFALL IW 87

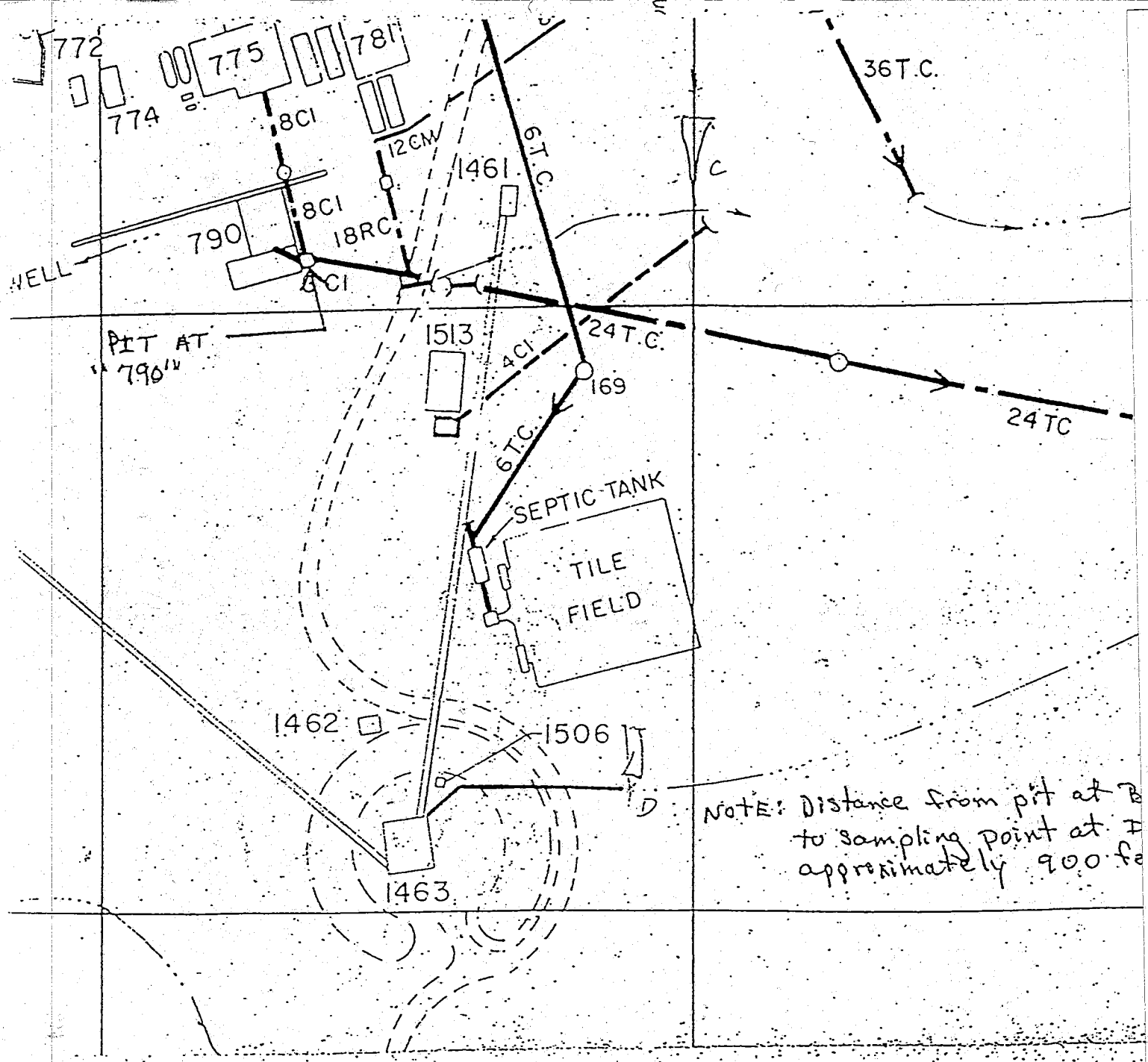
The background sample from sampling point "C" at IW 86 was negative for lead (less than the detectable limit).

The marsh or swamp area downstream of the outfall may be contaminated since this area receives the discharges from IW 87.

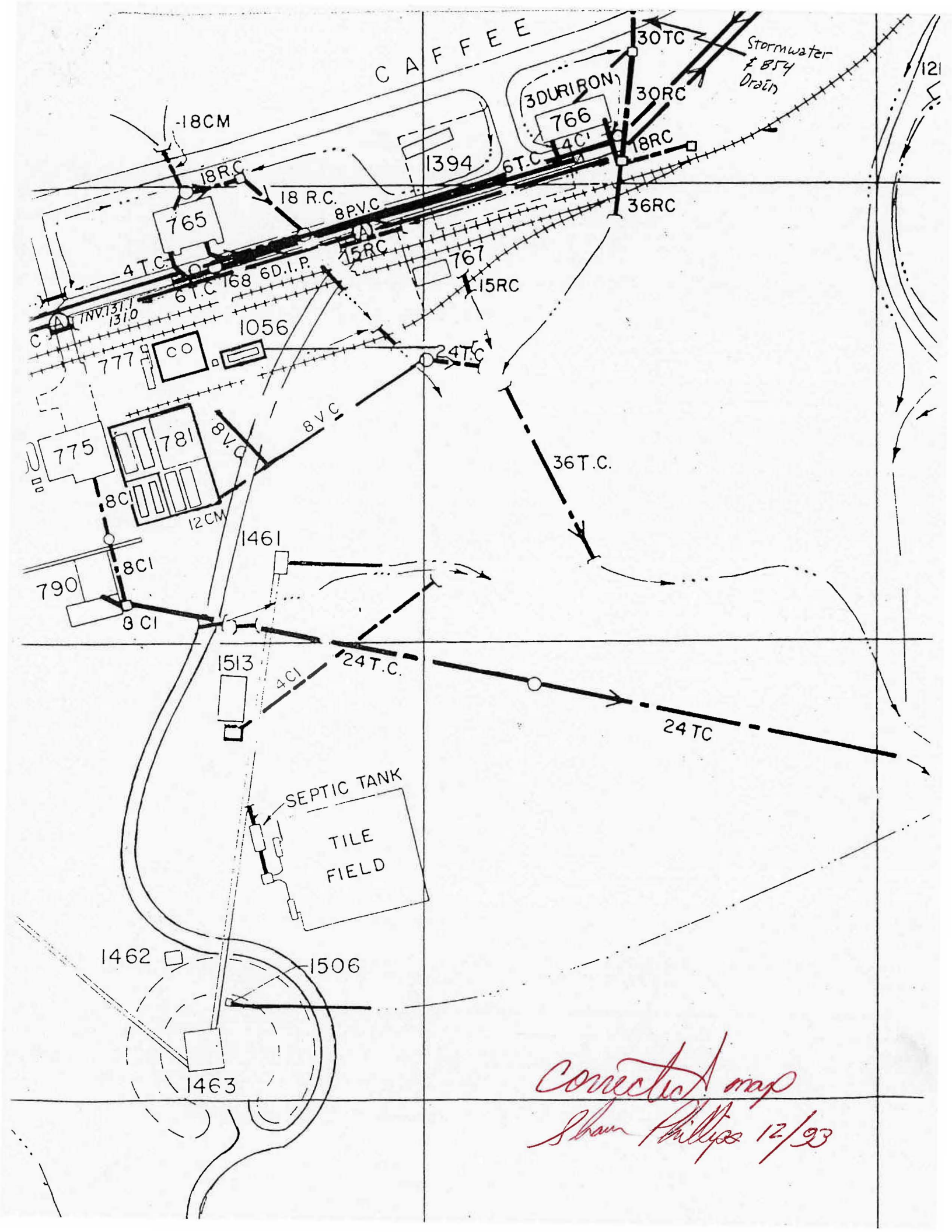
ALEX BRYAN

FRANK HANNAH

Copy to:
280, 2820,
2820C, 0952,
0952C, 0951G

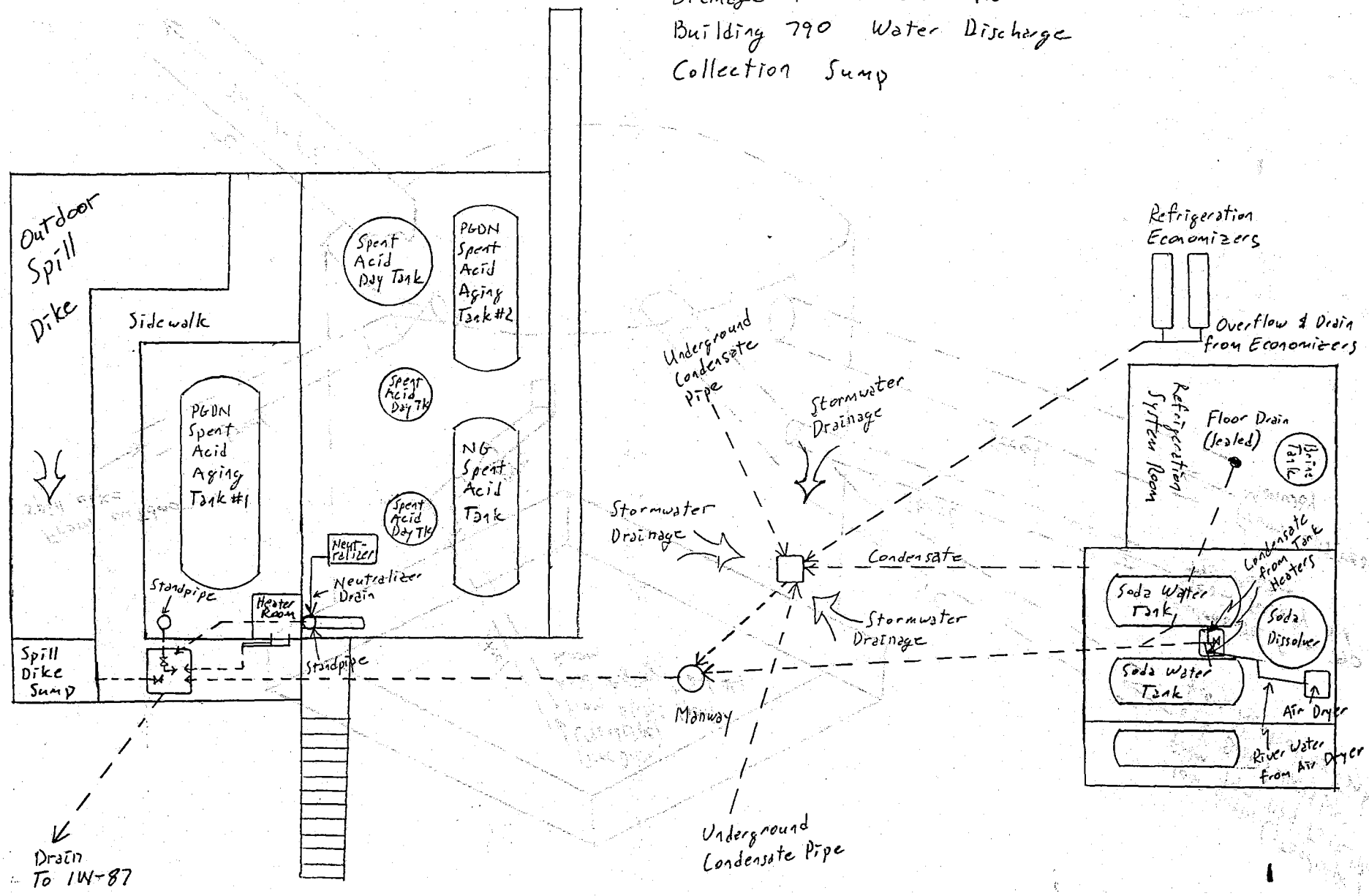


NOTE: Distance from pit at B
to sampling point at D
approximately 900 fe

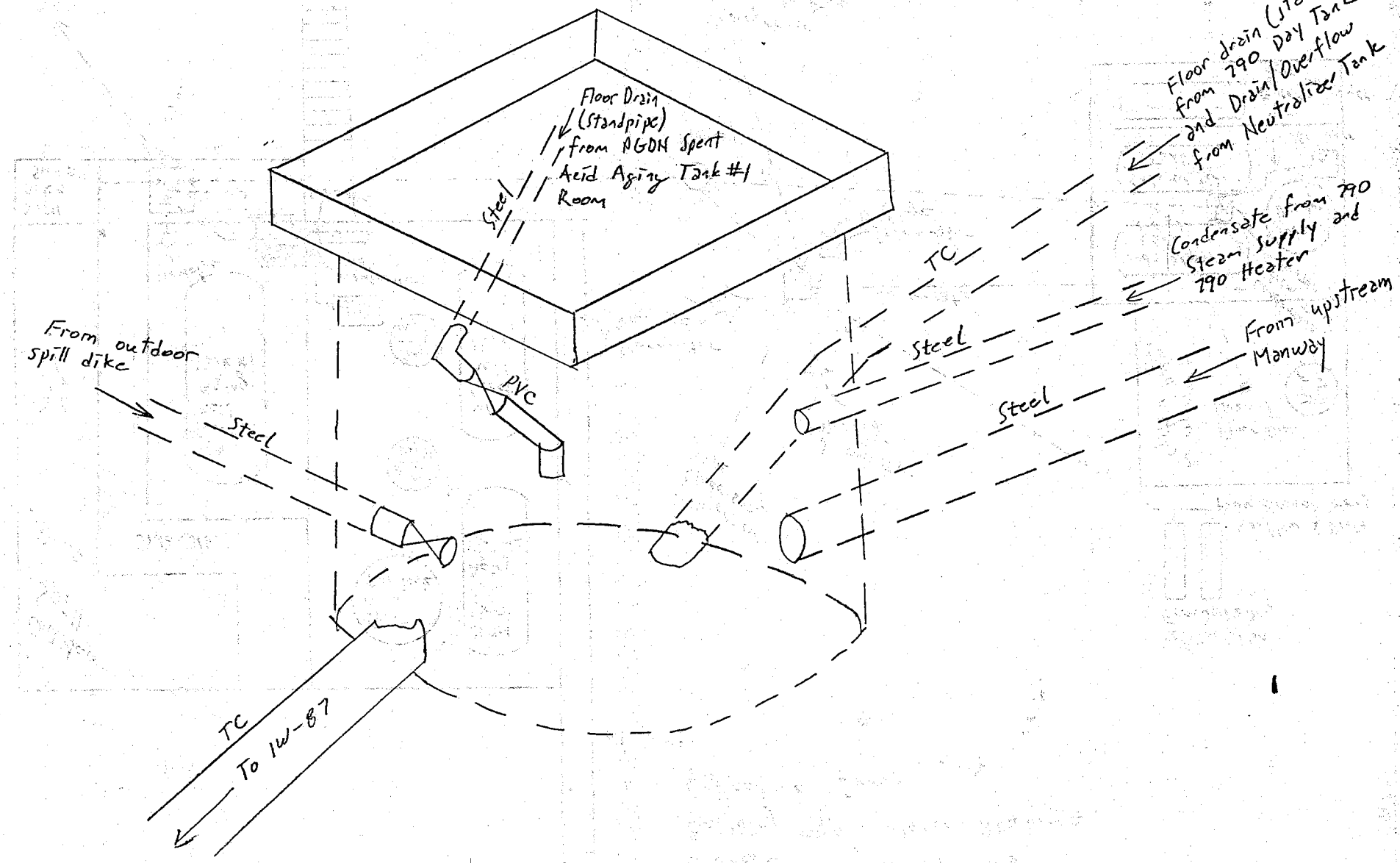


Corrected map
Shawn Phillips 12/93

Drainage to IW-87 via
Building 790 Water Discharge
Collection Sump



Building 790 Water Discharge
Collection Sump



	A	C	E	G
1	DATE	LOCATION OF	TYPE	RESULT OF ANALYSIS
2		SAMPLING POINT		
3				
4	6/2/93	STATION B/OUTFALL	COMPOSITE/NPDES/OTTO FUEL	0.0851 MG/L
5	7/21/93	STATION B/OUTFALL	COMPOSITE/NPDES/OTTO FUEL	0.401 MG/L
6	7/27/93	PIT AT 790	GRAB	4.430 MG/L
7	7/27/93	STATION B/OUTFALL	GRAB	0.985 MG/L
8	7/28/93	STATION B/OUTFALL	COMPOSITE/OTTO FUEL OPS	0.142 MG/L
9	7/29/93	STATION B/OUTFALL	COMPOSITE/NO OPERATIONS	0.165 MG/L
10	8/3/93	STATION B/OUTFALL	COMPOSITE/NPDES/OTTO FUEL	0.0924 MG/L
11	8/4/93	BOTTOM OF PIT BLDG 790	GRAB	0.822 MG/L
12	8/4/93	PIPE FROM 775 IN 790 PIT	GRAB	<0.100 MG/L
13	8/4/93	STATION B/OUTFALL	COMPOSITE/NO OPERATIONS	<0.100 MG/L
14	8/16/93	1643/DISCHARGE FROM SUMP	GRAB	<0.100 MG/L
15	7/28/93	STATION A/PIPE	SOIL	2060 MG/KG
16	7/28/93	STATION B/OUTFALL	SOIL	291 MG/KG
17	7/29/93	STATION A/PIPE	SOIL	568 MG/KG
18	7/29/93	STATION B/OUTFALL	SOIL	1530 MG/KG
19	8/3/93	STATION A/PIPE	SOIL	684 MG/KG
20	8/3/93	STATION B/OUTFALL	SOIL	1110 MG/KG
21	8/4/93	STATION A/PIPE	SOIL	2690 MG/KG

ENCLOSURE(2)

	A	C	E	G
1	DATE	LOCATION OF	TYPE	RESULT OF ANALYSIS
2		SAMPLING POINT		
3				
22	8/4/93	STATION B/OUTFALL	SOIL	878 MG/KG
23	8/4/93	STATION C/IW86	SOIL	<5.00 MG/KG
24	8/13/93	790/BOTTOM OF PIT	SOIL	18,200 MG/KG
25	8/16/93	1643/PIT AT DISCHARGE	SOIL	14 MG/KG

Indian Head Division
Naval Surface Warfare Center
101 Strauss Avenue
Indian Head, MD 20640-5035

WASTE MANAGEMENT & PREVENTION BRANCH
Code 0952
Phone: (301) 743-6745 or 6746
FAX: (301) 743-4180
DSN: 354-6745 or 6746

DATE: 13 DEC 93

TO: SHAWN PHILLIPS **PHONE:** (202) 433-3160

WASH NAVY YARD

FAX: (202) 433-6193

TOTAL PAGES: 7 (Including Cover Sheet)

Comments:

SHAWN,

HERE'S THE ORIGINAL LETTER WE SENT CONCERNING THE LEAD PROBLEM AT SITE 8. ALSO, THE TCLP RESULTS ARE IN AND ARE ENCLOSED. IT'S TCLP! YOU WILL BE RECEIVING A LETTER.

SHAWN

Shawn

7389
12/10/93

****
** CHEMICAL AND PHYSICAL ANALYSIS REPORT SSIC 8010 **
****

RECEIVED: 11/01/93
SPEC NUMBER:

SAMPLE NUMBER: 914240 (TCLP Extract)
SAMPLE DESCRIPTION: IW-87 (Soil)
CONTRACT NUMBER:
MANUFACTURER:
LOT #: TCLP-C

QATIP:
OTHER SPEC:
MIX #/RCN-LINE:

Nikki, FYI — trash when no longer useful thx

REQUESTED ANALYSIS	UNIT	RESULTS	MIN.	MAX.
TCLP Elements				
Ag : Silver Content	Milligrams/L	NR	-	5.0
As : Arsenic Content	Milligrams/L	NR	-	5.0
Ba : Barium Content	Milligrams/L	0.393	-	100.
Cd : Cadmium Content	Milligrams/L	< 0.020	-	1.0
Cr : Chromium Content	Milligrams/L	< 0.040	-	5.0
Hg : Mercury Content	Milligrams/L	< 0.0005	-	0.20
→ Pb : Lead Content	Milligrams/L	30.3 *	-	5.0
Se : Selenium Content	Milligrams/L	NR	-	1.0
Miscellaneous Elements				
Al : Aluminum Content	Milligrams/L	< 0.20	-	-
B : Boron Content	Milligrams/L	0.140	-	-
Ca : Calcium Content	Milligrams/L	3.11	-	-
Co : Cobalt Content	Milligrams/L	< 0.040	-	-
Cu : Copper Content	Milligrams/L	< 0.0120	-	-
Fe : Iron Content	Milligrams/L	0.985	-	-
Mg : Magnesium Content	Milligrams/L	1.13	-	-
Mn : Manganese Content	Milligrams/L	0.495	-	-
Mo : Molybdenum Content	Milligrams/L	< 0.040	-	-
Ni : Nickel Content	Milligrams/L	< 0.060	-	-
Sb : Antimony Content	Milligrams/L	0.105	-	-
Sn : Tin Content	Milligrams/L	< 0.080	-	-
Sr : Strontium Content	Milligrams/L	< 0.40	-	-
Ti : Titanium Content	Milligrams/L	< 0.40	-	-
V : Vanadium Content	Milligrams/L	< 0.040	-	-
Zn : Zinc Content	Milligrams/L	1.79	-	-

COMMENT: The sample was tested in accordance with the Toxicity Characteristic Leaching Procedure (Method 1311, SW-846) described in the Federal Register, Part II, EPA, 40 CFR Part 261 et al., "Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Toxicity Characteristic Revisions", June 29, 1990. Those results which are preceded by a less than symbol indicate that the analytes could not be detected at or above the detection limit of the analytical instrument. The number appearing to the right of the less than symbol is the detection limit of the analytical instrument for this particular analysis. An analysis was not requested on analytes reported as "NR". An asterisk "*" indicates analyte concentrations which exceed the regulatory level.

T. Willson S. Helberg

ANALYSTS: T. Willson S. Helberg DATE: 12/09/93

LABORATORY MANAGER: Gail Stine

CC: 0931C (A. Bryan)

7390

12/10/9

****
** CHEMICAL AND PHYSICAL ANALYSIS REPORT SSIC 8010 **
****

RECEIVED: 11/01/93
SAMPLE NUMBER: 914241 (TCLP Extract)
SPEC NUMBER:
SAMPLE DESCRIPTION: IW-B7 (Soil)
CONTRACT NUMBER:
QATIP:
MANUFACTURER:
OTHER SPEC:
LOT #: TCLP-B
MIX #/RCN-LINE:

REQUESTED ANALYSIS	UNIT	RESULTS	MIN.	MAX.
TCLP Elements				
Ag : Silver Content	Milligrams/L	NR	-	5.0
As : Arsenic Content	Milligrams/L	NR	-	5.0
Ba : Barium Content	Milligrams/L	0.288	-	100.
Cd : Cadmium Content	Milligrams/L	< 0.020	-	1.0
Cr : Chromium Content	Milligrams/L	< 0.040	-	5.0
Hg : Mercury Content	Milligrams/L	< 0.0005	-	0.20
→ Pb : Lead Content	Milligrams/L	13.2 *	-	5.0
Se : Selenium Content	Milligrams/L	NR	-	1.0
Miscellaneous Elements				
Al : Aluminum Content	Milligrams/L	< 0.20	-	-
B : Boron Content	Milligrams/L	0.183	-	-
Ca : Calcium Content	Milligrams/L	5.50	-	-
Co : Cobalt Content	Milligrams/L	< 0.040	-	-
Cu : Copper Content	Milligrams/L	< 0.0120	-	-
Fe : Iron Content	Milligrams/L	0.554	-	-
Mg : Magnesium Content	Milligrams/L	1.33	-	-
Mn : Manganese Content	Milligrams/L	0.435	-	-
Mo : Molybdenum Content	Milligrams/L	< 0.040	-	-
Ni : Nickel Content	Milligrams/L	< 0.060	-	-
Sb : Antimony Content	Milligrams/L	< 0.40	-	-
Sn : Tin Content	Milligrams/L	< 0.080	-	-
Sr : Strontium Content	Milligrams/L	< 0.40	-	-
Ti : Titanium Content	Milligrams/L	< 0.40	-	-
V : Vanadium Content	Milligrams/L	< 0.040	-	-
Zn : Zinc Content	Milligrams/L	4.16	-	-

COMMENT: The sample was tested in accordance with the Toxicity Characteristic Leaching Procedure (Method 1311, SW-846) described in the Federal Register, Part II, EPA, 40 CFR Part 261 et al., "Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Toxicity Characteristic Revisions", June 29, 1990. Those results which are preceded by a less than symbol indicate that the analytes could not be detected at or above the detection limit of the analytical instrument. The number appearing to the right of the less than symbol is the detection limit of the analytical instrument for this particular analysis. An analysis was not requested on analytes reported as "NR". An asterisk "*" indicates analyte concentrations which exceed the regulatory level.

ANALYSTS: T. Willson (T. Willson) S. Helberg (S. Helberg) DATE: 12/09/93

LABORATORY MANAGER: Gail Stine

CC: 0851C (A. Bryan)

7391

12/10

****
** CHEMICAL AND PHYSICAL ANALYSIS REPORT SSIC B010 **
****

RECEIVED: 11/01/93
SPEC NUMBER:

SAMPLE NUMBER: 914242 (TCLP Extract)
SAMPLE DESCRIPTION: IW-87 (Soil)
CONTRACT NUMBER:
MANUFACTURER:
LOT #: TCLP-A

RATIP:
OTHER SPEC:
MIX #/RCN-LINE:

REQUESTED ANALYSIS	UNIT	RESULTS	MIN.	MAX.
TCLP Elements				
Ag : Silver Content	Milligrams/L	NR	-	5.0
As : Arsenic Content	Milligrams/L	NR	-	5.0
Ba : Barium Content	Milligrams/L	0.164	-	100.
Cd : Cadmium Content	Milligrams/L	< 0.020	-	1.0
Cr : Chromium Content	Milligrams/L	< 0.040	-	5.0
Hg : Mercury Content	Milligrams/L	< 0.0005	-	0.20
→ Pb : Lead Content	Milligrams/L	7.04 *	-	5.0
Se : Selenium Content	Milligrams/L	NR	-	1.0
Miscellaneous Elements				
Al : Aluminum Content	Milligrams/L	< 0.20	-	-
B : Boron Content	Milligrams/L	< 0.040	-	-
Ca : Calcium Content	Milligrams/L	4.38	-	-
Co : Cobalt Content	Milligrams/L	< 0.040	-	-
Cu : Copper Content	Milligrams/L	0.0527	-	-
Fe : Iron Content	Milligrams/L	0.152	-	-
Mg : Magnesium Content	Milligrams/L	0.760	-	-
Mn : Manganese Content	Milligrams/L	0.901	-	-
Mo : Molybdenum Content	Milligrams/L	< 0.040	-	-
Ni : Nickel Content	Milligrams/L	< 0.060	-	-
Sb : Antimony Content	Milligrams/L	< 0.40	-	-
Sn : Tin Content	Milligrams/L	< 0.080	-	-
Sr : Strontium Content	Milligrams/L	< 0.40	-	-
Ti : Titanium Content	Milligrams/L	< 0.40	-	-
V : Vanadium Content	Milligrams/L	< 0.040	-	-
Zn : Zinc Content	Milligrams/L	0.256	-	-

COMMENT: The sample was tested in accordance with the Toxicity Characteristic Leaching Procedure (Method 1311, SW-846) described in the Federal Register, Part II, EPA, 40 CFR Part 261 et al., "Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Toxicity Characteristic Revisions", June 29, 1990. Those results which are preceded by a less than symbol indicate that the analytes could not be detected at or above the detection limit of the analytical instrument. The number appearing to the right of the less than symbol is the detection limit of the analytical instrument for this particular analysis. An analysis was not requested on analytes reported as "NR". An asterisk "*" indicates analyte concentrations which exceed the regulatory level.

ANALYSTS: T. Willson S. Helberg DATE: 12/09/93

LABORATORY MANAGER: Gail Stine

CC: 0851C (A. Bryan)