Recovery Well Rehabilitation Workplan

Claremont Polychemical Operable Unit 5 – Operations and Maintenance (Site #130015)

150 Winding Road, Old Bethpage, NY

June 2021

Contents

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1 Introduction

The former Claremont Polychemical Corp. (CPC) site was located on a 9.5-acre parcel at 501 Winding Road in Old Bethpage, Nassau County, New York (Figure 1). CPC, a former manufacturer of pigments for plastics and inks, coated metal flakes, and vinyl stabilizers, operated from 1966 to 1980. In 1979, the Nassau County Department of Health (NCDH) found 2,000 to 3,000 drums of inks, resins, and organic solvents throughout the site during a series of inspections. Inspectors identified releases associated with damaged or mishandled drums in several areas. CPC sorted and removed the drums in 1980 and then ceased operations. EPA proposed the site for listing on the National Priorities List (NPL) in October 1984 and CPC was subsequently placed on the NPL in June 1986.

Remedial Investigation/Feasibility Study (RI/FS) findings indicated that on-site soils contaminated with tetrachloroethylene (PCE) constituted a potential threat to groundwater resources. Other VOCs including 2-Butanone, Toluene, Xylene, 1,2-cis Dichloroethene (cDCE), Trichloroethene (TCE), 1,1,1-Trichloroethane (1,1,1-TCA), Ethylbenzene, 1,2-Dichloroethane (1,2-DCA), Methylene Chloride, and Vinyl Chloride (VC) were also detected in groundwater at concentrations exceeding federal and state standards.

The EPA issued two RODs selecting remedies for six operable units (OU) and two Explanations of Significant Differences (ESDs) which modified these remedies. The OUs address the identification and abatement of the source of contamination on the property and the groundwater contamination from CPC. The OUs are:

- OU-1 - Treatment and removal of wastes in underground storage tanks.
- OU-2 - Compatibility testing, bulking/consolidation and treatment/disposal of wastes in deteriorated containers, aboveground tanks, and treatment basins; soil under the Former Process Building; removal of miscellaneous construction debris, operation of a soil vapor extraction system; and institutional controls.
- OU-3 - Treatment of PCE-contaminated soils via low-temperature enhanced volatilization (LTEV)
- OU-4 - Treatment of the CPC on-Property contaminated groundwater
- OU-5 - Treatment of the CPC off-Property contaminated groundwater
- OU-6 - Decontamination of the former Process Building.

The first ROD, signed on September 22, 1989, addressed the OU-2 wastes stabilized during the September 1988 removal action and called for compatibility testing, bulking/consolidation and treatment/disposal of wastes in deteriorated containers, aboveground tanks, and treatment basins. In April 2003, the EPA issued an ESD to include additional remedial actions for OU-2 including the removal of construction debris, soil vapor extraction, and institutional controls. The second ROD, signed on

September 28, 1990, addressed the comprehensive remedy for the remainder of the Site through five additional OUs including OU-5 for off-site groundwater.

CPC OU-5 addresses the extraction, treatment, conveyance, and discharge of offsite groundwater contamination. During the implementation of the second ROD it became apparent that three of the Old Bethpage Landfill (OBL) Site groundwater recovery wells were capturing the CPC off-Property groundwater plume. EPA issued an ESD in September 2000 that the OBL groundwater extraction and treatment (GWE&T) system owned by the Town of Oyster Bay was capturing the CPC OU-5 off-site groundwater plume. Therefore, the system would continue to be used to capture the CPC OU-5 off-site plume. The Town of Oyster Bay operated the OBL GWE&T under a Municipal Response Action Reimbursement Agreement to treat contaminated groundwater associated with CPC OU-5 from January 1997 through January 2007, followed by a State Assistance Contract (SAC) from January 2007 through 2017. The NYSDEC terminated the SAC with the Town of Oyster Bay in August 2016 in a Site Transfer Agreement that outlined the schedule, terms, and responsibilities of the transfer. In October 2016, the NYSDEC took over the operation of the OU-5 GWE&T.

The OU-5 GWE&T system includes a groundwater recovery system, water conveyance piping, treatment system, discharge system, and monitoring well network. The five recovery wells (RW-1, RW-2, RW-3, RW-4 and RW-5) are downgradient of the former CPC facility in the Bethpage State Park Black Golf Course (Figure 1). Underground piping conveys the groundwater from the extraction wells to a treatment system. The treatment system, including an air stripper housed in a 3,100 square foot building for monitoring and controlling the system, is located west of the CPC source at 150 Winding Road within the Town of Oyster Bay Solid Waste Disposal Complex. The treated effluent is discharged to Recharge Basin No. 1 located west of OBL in October through April. During the summer months the discharge is directed Recharge Basin No. 33 west of the Bethpage State Park Black golf course and used for irrigation. In October 2016 during the operational transition of the OU-5 GWE&T facility, NYSDEC gave the Town of Oyster Bay permission to discontinue treatment of the OBL plume which involved shutting down recovery wells RW-1 and RW-2.

The NYSDEC is planning on using the GWE&T system to hydraulically capture, treat, and discharge contaminated groundwater coming from CPC. This will be accomplished using OBL GWE&T recovery wells RW-3, RW-4, and RW-5, and associated monitoring well network. Given the age of these extraction wells (circa early 1990s), the NYSDEC is considering rehabilitating recovery wells RW-3, RW-4, and RW-5 so that these wells are capable of achieving the OU5 goals for many years.

2 Description

The groundwater collection system originally included five extraction wells; RW-1, RW-2, RW-3, RW-4, and RW-5 approximately 800 feet apart located in Bethpage State Park Black Golf Course south of the CPC site (Figure 1). The recovery wells were designed with the total maximum designed flow of 1.5 million of gallons per day (mgd)

to the treatment system. The recovery wells were each designed to withdraw 210 gpm. Table 1 provides recovery well construction details.

Table 1 - CPC OU-5 Recovery Well Construction Details

Recovery Well	Total Depth (ft.)	Top of Screen (ft. bgs)	Bottom of Screen (ft. bgs)	Screened Interval (ft.)	Pump Depth (ft. bgs)
RW-1*	280	185	265	80	72
RW-2*	290	230	271	41	114
RW-3	275	163	255	92	91
RW-4	270	147	250	103	115
RW-5	283	153	263	110	120

*RW-1 and RW-2 will not be included in this well rehabilitation.

The specific capacity, which is the gpm per foot of drawdown, in each recovery well was determined during a 2018 remedial system optimization (RSO) evaluation (Table 2) (HDR, 2019). Recovery well pumping rates and drawdown from 12-hour individual well pumping tests were used to calculate the RSO specific capacities.

Table 2 - Recovery Well Specific Capacity

Recovery Well ID	Drawdown in Well* (ft.)	Pumping Rate* (gpm)	Current Specific Capacity (gpm/ft.)	Original Specific Capacity (gpm/ft.)	Decrease from Original Specific Capacity
RW-3	12.83	244	19	23	17%
RW-4	8.45	254	30	50	40%
RW-5	8.97	215	24	45	46%

*From 2018 RSO evaluation (HDR, 2019)

Changes in a well's specific capacity can be used as an indicator of a reduction in well efficiency. A well's specific capacity will typically degrade over years of operation as a result of fine- grained formation material collecting in the filter pack, bacterial growth, and mineral encrustation. Generally, a decrease of 25% or more in specific capacity indicates that rehabilitation could improve well performance. A comparison of the original well specific capacity to the current value (Table 2), shows the change in specific capacity has reduced from 17 to 46 percent.

This workplan has been prepared as a guide to rehabilitate selected recovery wells and increase specific capacity and the overall performance of each well.

Recovery well rehabilitation will include the following:

a. Conduct pre-rehabilitation step test;
b. Remove and inspect pumping equipment;
    i. Replace pump or component parts, if needed;
c. Conduct pre-rehabilitation video inspection of well;
d. Install temporary sediment removal system and connect to the GWE&T conveyance piping;
e. Complete well cleaning and rehabilitation;

f. Conduct post-rehabilitation video inspection of well;

g. Install pumping equipment;

h. Conduct post-rehabilitation step test; and

i. Prepare final report.

3 Execution

3.1 Existing Conditions

Recovery wells are located within the Bethpage State Park Black golf course (Figure 1). Recovery wells are completed in below grade vaults. The vault for RW-3 is accessible via two adjacent manhole openings. The vaults for RW-4 and RW-5 are underneath small well houses with a roof hatch providing crane access to the pumping equipment. Existing conditions have been documented with photos, included in the attached photolog (Attachment A). GWE&T engineering drawings are also provided as Attachment B.

Recovery wells are 10-inch diameter. The submersible pumps are installed on a 4-inch stainless steel discharge column that was welded together during installation resulting in a continuous length of pipe between the ground surface and the pump depth.

Mechanical piping in the vaults connects the pump to the conveyance line. Materials are 4-inch diameter Schedule 80 PVC with flanged connections. Equipment in the vault includes an isolation valve, dresser coupling, and flow meter.

Each recovery well has a 480V, 3 phase electrical service to power the pump. This power is also transformed down in each well house to provide a 110V outlet. Electric service is run to each well from a central location at the golf course.

3.2 Pre-Rehabilitation Step Test with Owners Pump

The pre-rehabilitation step test will be completed to establish a baseline specific capacity. This test will include four steps, each consisting of at least 90 minutes of continuous pumping. The water will be pumped to the existing treatment facility at flows up to 350 gpm for treatment.

Required data recording:

1. Measure and record the static level in the well immediately prior to start of pumping and note the method of measurement.
2. Step Testing Period Records – continuous:
    a. During each pumping step, measure and record the flow rate and pumping level every minute for the first fifteen minutes; then every five minutes for the next forty-five minutes; then every ten minutes thereafter.
    b. Upon shut-down, measure and record the water level, and elapsed time since shut-down, at intervals of not less than one (1) minute for the first thirty (30) minutes; then every five (5) minutes for the next ninety (90) minutes.

c. Throughout the period of step test pumping, note in the log any observed changes in the characteristics of the discharge, such as color or turbidity, etc.

3.3 Removal and Inspection of Existing Pumping Equipment

The pump riser and electric submersible pump assembly will be disconnected and removed from the well. Pump riser and electric submersible pump assembly will be inspected for damage, encrustation, or clogging. All equipment will be removed and stored in a staging area.

The pumps are installed on 4-inch diameter stainless steel riser pipe that was welded together during initial installation. The riser pipe and pump assembly will either be removed in one piece or cut in sections during removal.

Once the pump and pipe assembly has been removed from the well, the pump will be disconnected from the riser pipe and stored inside the well house along with the electrical cable. The riser pipe can be stored outside the well house in a staging area. The pump will be inspected, and recommendations will be made to replace the pump or component parts, if needed.

3.4 Pre-Rehabilitation Well Video Inspection

A video inspection of the well will be completed to confirm construction details, well conditions such as fouling, silting and damage. This will be completed no sooner than 24-hours after removing the pump to allow the water to be as clear or turbid free as possible. The well will be flushed with potable water prior to and during the video inspection to make sure the water is clear for the video.

3.5 Well Cleaning and Well Rehabilitation

The well casing and screen (if not damaged as indicated by the video) will be cleaned with a wire brush to remove all loose materials that may have attached to the screen and well casing. The well will be developed with high energy mechanical techniques such as double surge block or high pressure jetting with simultaneous air lift pumping, liquid carbon dioxide, or air shock methods.

Well rehabilitation (simultaneous surge block/jetting and air lift pumping or over-pumping after carbon dioxide or shock methods) will begin using flow rates less than 200 gpm (typical operational flow rate) and the flow rate will be increased slowly over the first day. After the first day, the flow rate will be brought up to 200 gpm. The static water level in the well and a 1-hour specific capacity test will be completed at the start of each day. The specific capacity measured each morning will be compared to specific capacity measured in previous mornings to assess daily improvements. Well rehabilitation will continue as daily specific capacity continues to improve. Well rehabilitation will be complete when the specific capacity over two days is stable and there is no evidence of sand in the water. Well rehabilitation is estimated to take up to 10 working days per well.

3.5.1 Well Rehabilitation Water Management

All water pumped from the well during rehabilitation will be conveyed to the GWE&T system. Given the restraints and site limitations of working within the Bethpage State Park Black golf course considerations will have to be made regarding water conveyance and schedule with NYS Parks.

Figure 2 provides potential staging areas for water handling. Water will initially be conveyed and stored in 10,000-gallon, open top, weir tanks to allow coarse-grained sediment to settle. Water will be pumped from the weir tank through bag filters to remove fine-grained sediment (total suspended solids (TSS) concentration is less than 50 mg/L) and conveyed to the GWE&T conveyance system where it will be pumped back to the GWE&T treatment system. Any solids collected in the tank or bag filters will be tested before disposal.

3.6 Post Rehabilitation Well Video Inspection

A video inspection of the well will be completed to confirm post rehabilitation well conditions. This will be completed no sooner than 24-hours after well rehabilitation to allow the water to be as clear or turbid free as possible. The well will be flushed with potable water prior to and during the video inspection to make sure the water is clear for the video.

3.7 Reinstallation or the Owners Pumping Equipment

The pumping equipment will be installed in the well and the reconnect to the GWE&T conveyance piping. All electrical connections will be restored.

3.8 Post Rehabilitation Step Test with Owners Pump

The post-rehabilitation step test will be completed and compared to the pre-rehabilitation step- test (i.e., specific capacity) to document well improvements. This test will include four steps, each consisting of at least 90 minutes of continuous pumping. The contractor shall furnish and install a butterfly valve (or equivalent) to adjust flow. The contractor will also furnish and install a test discharge pipe with a calibrated totalizing flowmeter and anticipate a range of testing flows within the range of 100 gpm to 350 gpm. The discharge pipe will be connected to the existing GWE&T conveyance line in the well head pit or at a nearby air release valve pit. The water will be pumped to the existing treatment facility at flows up to 350 gpm for treatment.

Required data recording:

1. Measure and record the static level in the well immediately prior to start of pumping and note the method of measurement.
2. Step Testing Period Records – continuous:

    d. During each pumping step, measure and record the flow rate and pumping level every minute for the first fifteen minutes; then every five minutes for the next forty-five minutes; then every ten minutes thereafter.

e. Upon shut-down, measure and record the water level, and elapsed time since shut-down, at intervals of not less than one (1) minute for the first thirty (30) minutes; then every five (5) minutes for the next ninety (90) minutes.

f. Throughout the period of step test pumping, note in the log any observed changes in the characteristics of the discharge, such as color or turbidity, etc.

4 Final Report

A final report will be prepared to document the well rehabilitation process and summarize the data.

The report will include the methods and procedures used to rehabilitate the well. The report will also document water and sediment treatment and disposal. The report will document:

1. Depth to bottom of the well (indicate borehole diameter);
2. Depth to top and bottom of the screen;
3. Depth to pump intake;
4. Pump manufacturer and model number if available;
5. Indicate outside diameter (O.D.) of pump riser and pump;
6. Indicate the static water levels before the start of step testing and date the level was recorded;
7. Specific capacities, pumping level and rate for every step test step;
8. Test data and observations recorded during the step tests; and
9. Any recommendations for future work.

5 Projected Schedule

The following approximate schedule is provided for each recovery well.

Table 3 - Schedule Outline per Recovery Well

Day	Work Plan Section	Task
1	3.2	Pre rehabilitation step test with Owner's pump
2	3.3	Pump removal and inspection
3	--	24-hour period between pump removal and video inspection
4	3.4, 3.5	Pre rehabilitation well video inspection & well cleaning
5 thru 15	3.5	Well rehabilitation
16		24-hour period between pump removal and video inspection
17	3.6, 3.7	Video inspection and Reinstallation of Owner's pump
18	3.8	Post rehabilitation step test with Owner's pump
19		Complete hook-up and demobilize

6 Assumptions/Clarifications

The following assumptions have been made and need to be verified prior to starting work.

- Work will be coordinated with New York State Parks and the Bethpage State Park personnel.
- Work will be conducted during golf course off-season.
- Staging areas, as shown on Figure 2, are acceptable to New York State Parks.
- Air relief valves vaults are mechanically sound and can be used to introduce water into the conveyance piping.
- Chemical treatment is not included.
- There will be regular communication and coordination with the NYSDEC CPC treatment plant operator.

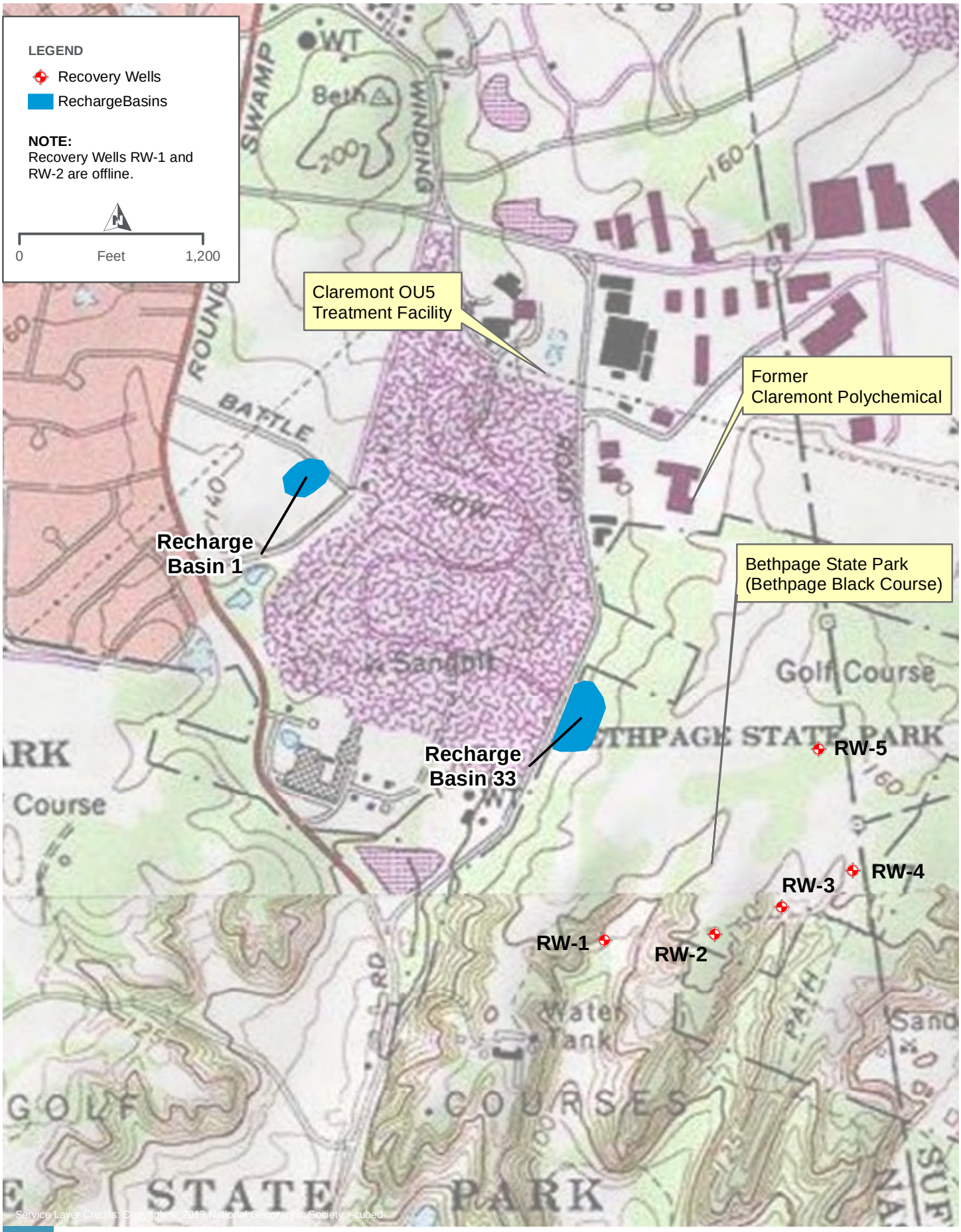
7 References

New York Consolidated Laws, 2013. Environmental Conservation Law 15-1525.

ANSI/AWWA, 2007. Standard for Water Wells, ANSI/SWWA A100-06.

HDR, 2019. Remedial System Optimization Evaluation, Claremont Polychemical Operable Unit 5. May 2, 2019.

Figures



Site Location and Extraction System

CLAREMONT POLYCHEMICAL CORPORATION

FIGURE 1

PATH: \\NJ-MAHWAH\ACTIVEPROJECTS\202315\CON0105889\0000000002759621\7.0_GIS_MODELS\7.2_WORK_IN_PROGRESS\MAP_DOCS\2020_Q4\FIG2_SAMPLELOCATION_UPDATED20201030.MXD - USER: JRHEE - DATE: 4/21/2021

POTENTIAL WATER HANDLING STAGING AREAS
CLAREMONT POLYCHEMICAL CORPORATION

FIGURE 2

PATH: \\NJ-MAHWAH\ACTIVEPROJECTS\202315\CON0105889\0000000002759621\7.0_GIS_MODELS\7.2_WORK_IN_PROGRESS\MAP_DOCS\FIG2_WADDEN_WELLREHAB.MXD - USER: AWADDEN - DATE: 4/15/2021

Attachment A

Photographic Log

RW-3

Well house with well located to right in two adjacent vaults

RW-4

Well house with well located in vault underneath

RW-5

Well house with well located in vault underneath

RW-4 and RW-5

Typical vault under well house (confined space).

RW-4 and RW-5

Typical vault under well house (confined space).

RW-4 and RW-5

Roof hatch on ceiling of well house.

RW-3, RW-4, and RW-5

Typical mechanical equipment in vault.

RW-3, RW-4, and RW-5

Typical mechanical equipment in vault.

RW-3, RW-4, and RW-5

Typical mechanical equipment in vault.

RW-3, RW-4, and RW-5

Typical mechanical equipment in vault.

Water Handling; RW-3 and RW-4

Potential tank staging area (as shown on Figure 2).

Water Handling; RW-5

Potential tank staging area (as shown on Figure 2).

Water Handling; RW-5

Access proximal to the potential tank staging area.

Water Handling; RW-5

Space between RW-5 and potential tank staging area

Water Handling

Typical air relief valve vault for connection to conveyance line.

3-inch flange connection at bottom of air relief valve.

Attachment B

GWE&T Engineering Drawings

LIST OF DRAWINGS

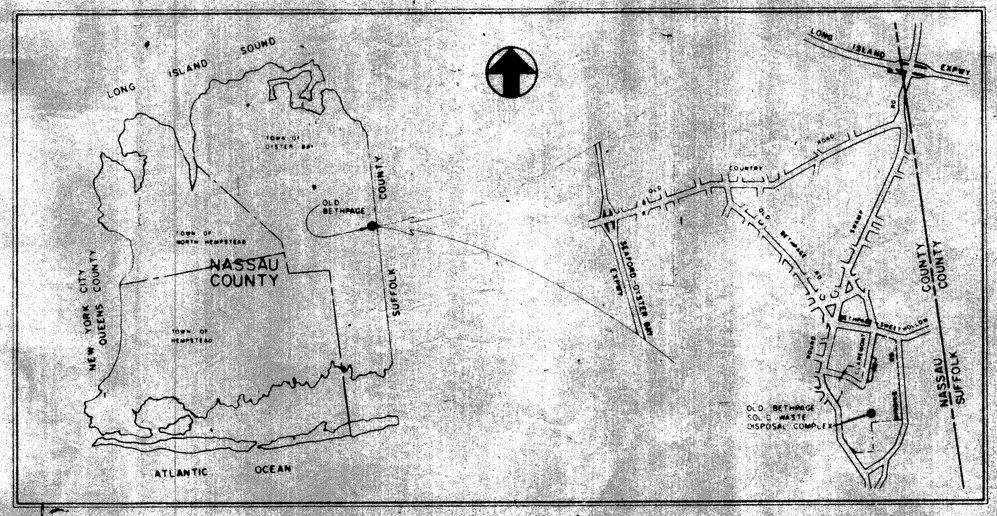
SHEET NO.	DWG. NO.	DESCRIPTION
		INFORMATION DRAWINGS
1	SB-1	SOIL BORINGS - LOCATION
2	SB-2	SOIL BORINGS - LOGS
		CONTRACT NO. TBI 86-400GC-GENERAL CONSTRUCTION
3	GN	LEGEND & GENERAL NOTES
4	G-1	GENERAL PLAN
5	G-2	SITE PLAN - WELL #1 & TRANSMISSION LINE
6	G-3	SITE PLAN - WELL #2 & #3 & TRANSMISSION LINE
7	G-4	SITE PLAN - WELL #4 & TRANSMISSION LINE
8	G-5	SITE PLAN - WELL #5 & TRANSMISSION LINE
9	G-6	SITE PLAN - TRANSMISSION LINE
10	G-7	SITE PLAN - TRANSMISSION LINE
11	G-8	SITE PLAN - TRANSMISSION LINE
12	G-9	SITE PLAN - TREATMENT PLANT - DISCHARGE & TRANSMISSION
13	G-10	SITE PLAN - DISCHARGE LINE
14	G-11	SITE PLAN - DISCHARGE LINE AND DIFFUSION WELLS
15	G-12	LONGITUDINAL PROFILE - TRANSMISSION LINE
16	G-13	LONGITUDINAL PROFILE - TRANSMISSION LINE
17	G-14	LONGITUDINAL PROFILE - TRANSMISSION LINE
18	G-15	LONGITUDINAL PROFILE - WELL #3, #4 & #5
19	G-16	LONGITUDINAL PROFILE - TREATMENT PLANT TO RECHARGE BASIN
20	G-17	LONGITUDINAL PROFILE - TREATMENT PLANT TO RECHARGE BASIN
21	G-18	PRODUCTION WELLS - DETAILS
22	G-19	INTERFACE - PHASE 1 & 2 BUILDING & EQUIPMENT
23	G-20	TREATMENT PLANT - UPPER FLOOR & LOWER FLOOR
24	G-21	TREATMENT PLANT - SECTIONS A-A & B-B
25	G-22	TREATMENT PLANT - SECTIONS C-C, D-D, E-E & F-F
26	G-23	TREATMENT PLANT - AIR STRIPPER & DETAILS
27	G-24	ISOMETRIC PIPING ARRANGEMENT
28	G-25	MISCELLANEOUS DETAILS I - TRANSMISSION LINE
29	G-26	MISCELLANEOUS DETAILS II
30	G-27	MISCELLANEOUS DETAILS III - DIFFUSION WELL
31	G-28	MISCELLANEOUS DETAILS IV
32	L-1	SITE PLAN -DETAILS
33	L-2	SITE PLAN - SANITARY & STORM DRAINAGE DETAILS
34	L-3	SITE PLAN - MISCELLANEOUS DETAILS
35	A-1	TREATMENT PLANT - ARCHITECTURAL - BUILDING FLOOR PLAN
36	A-2	TREATMENT PLANT - ARCHITECTURAL - MEZZANINE PLAN & SECTIONS
37	A-3	TREATMENT PLANT - ARCHITECTURAL - BUILDING ELEVATIONS & SECTIONS
38	A-4	TREATMENT PLANT - ARCHITECTURAL - SCHEDULES
39	S-1	TREATMENT PLANT - STRUCTURAL - PILE PLAN
40	S-2	TREATMENT PLANT - STRUCTURAL - PILE CAP PLAN
41	S-3	TREATMENT PLANT - STRUCTURAL - FLOOR PLANS
42	S-4	TREATMENT PLANT - STRUCTURAL - SECTIONS & DETAILS
43	S-5	TREATMENT PLANT - STRUCTURAL - SECTIONS & DETAILS

TOWN OF OYSTER BAY
NASSAU COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS

"AS BUILT" DRAWINGS

PHASE 1 - CONSTRUCTION
FOR THE
GROUNDWATER REMEDIATION PROGRAM
AT THE
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX

CONTRACT NO. TBI 86-400 GC, P, E & HVAC-R



PREPARED BY
LARRY E. TYREE

GROUNDWATER TREATMENT PLANT
AIR STRIPPER
10" TRANSMISSION LINE
10" DISCHARGE FORCE MAIN
EXISTING RECHARGE BASIN
(EXISTING) DISCHARGE FORCE MAIN
10" DISCHARGE FORCE MAIN
12" DISTRIBUTION PIPE
RECHARGE BASIN NO.1
DIFFUSION WELL FIELD
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX
10" TRANSMISSION LINE
EXISTING RECHARGE BASIN
BETHPAGE STATE PARK GOLF COURSE
PRODUCTION WELL (TYPICAL)
TRANSMISSION LINE
DRAWING BOUNDARY LINE
MATCH LINE "A" THIS DWG.
MAINTENANCE AREA
LILCO PICKUP POLE
WELL & PUMP STATION NO.3
EXISTING RECHARGE BASIN
MATCH LINE "A" SEE THIS DWG.
G-2
G-3
G-4
G-5
G-6
G-7
G-8
G-9
G-10
G-11
E-1

AS-BUILT

REV.	DATE	REMARKS	BY

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889
SYOSSET, NEW YORK

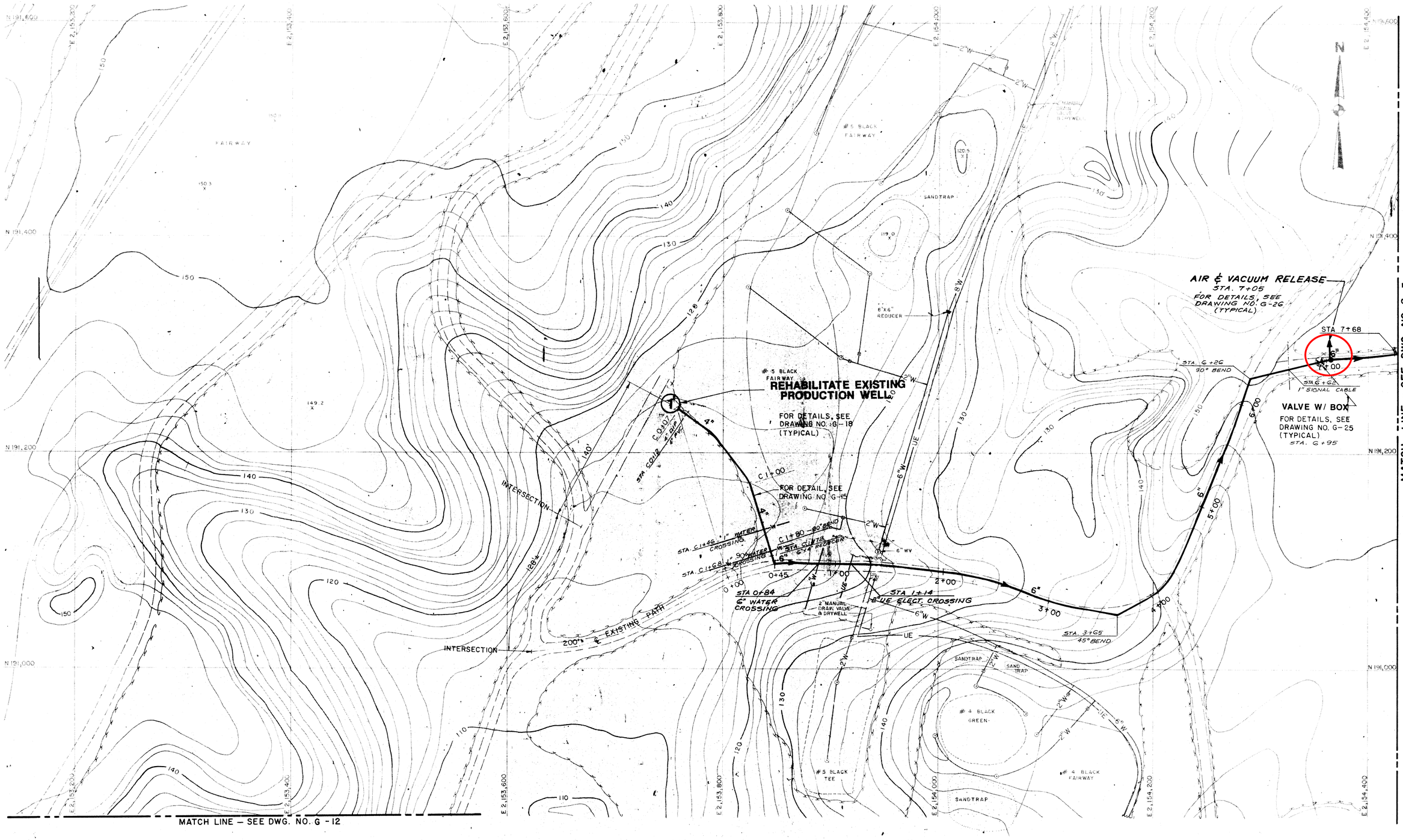
PROJECT NAME: OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE: GENERAL PLAN

DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=200'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-1
SHEET 4 OF 57

LKB 15/87



AS-BUILT

REV.	DATE	REMARKS	BY

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LKB

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE
SITE PLAN
WELL #1 AND TRANSMISSION LINE

DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=40'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-2
SHEET 5 OF 57

LKB 1187
138410

MATCH LINE - SEE DWG. NO. G-4

MATCH LINE - SEE DWG. NO. G-2

STA 17+70
EQ STA 17+02

STA 17+18
UE ELECT. CROSSING

STA 17+10
8" WATER CROSSING

STA A2+40

STA A2+63 - VALVE W/ BOX

STA 17+04 = STA A2+74
10" x 10" x 6" TEE

FOR DETAIL, SEE
DRAWING NO. G-15

STA 16+97
90° BEND

VALVE W/ BOX
STA 16+47

STA 16+92
10" x 8" REDUCER

AIR & VACUUM RELEASE
STA. 16+57

STA 15+26
2" WATER
CROSSING

STA 16+22
2" WATER
CROSSING

STA 15+37
22° BEND

PRODUCTION WELL

VALVE W/ BOX
STA. 12+35

STA 10+46
22° BEND

STA 13+07
8" x 8" x 4" TEE

STA 13+18
22° BEND

STA 14+99
22° BEND

STA 11+96
22° BEND

DRAIN
STA. 12+45
FOR DETAILS, SEE
DRAWING NO. G-26
(TYPICAL)

STA 8+06
8" x 6" REDUCER

STA 8+13
8" x 8" x 4" TEE

STA 7+66

PRODUCTION WELL

AS-BUILT

REV.	DATE	REMARKS	BY

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE
SITE PLAN
WELLS #2, #3 AND TRANSMISSION LINE

DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=40'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-3
SHEET 6 OF 57

LKB 11187
135610


MATCH LINE - SEE DWG. NO. G-5
STA 26+18
STA. 25+85
22° BEND
STA. 24+76
22° BEND
AIR & VACUUM RELEASE
STA. 23+83
VALVE W/ BOX
STA. 23+77
STA. 23+56
22° BEND
10"
STA. 22+56
22° BEND
N 192,000
VALVE W/ BOX
STA. 20+70
DRAIN
STA. 20+80
2"W (TYP)
N 191,800
AIR & VACUUM RELEASE
STA. 19+04
VALVE W/ BOX
STA. 18+98
STA. 18+71
45° BEND
10"
VALVE W/ BOX
STA. 17+77
DRAIN
STA. 17+87
STA. 17+02
SUFFOLK
NASSAU
COUNTY
STA. A0+45
6" PVC
6" DIP
STA. A0+94
90° BEND
PRODUCTION WELL
STA. A0+38
6"
FOR DETAIL
SEE DWG NO G-15
STA. A2+40
MATCH LINE - SEE DWG. NO. G-3

AS - BUILT

REV.	DATE	REMARKS	BY

CLIENT: TOWN OF OYSTER BAY DEPARTMENT OF PUBLIC WORKS SYOSSET, NEW YORK

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

PROJECT NAME: OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE: SITE PLAN WELL #4 AND TRANSMISSION LINE

DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=40'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-4
SHEET 7 OF 57

MATCH LINE – SEE DWG. NO. G-6

MATCH LINE – SEE DWG. NO. G-4

AS – BUILT

REV.	DATE	REMARKS	BY

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LKB

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE
SITE PLAN
WELL #5 AND TRANSMISSION LINE

DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=40'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION

DRAWING NO. G-5

SHEET 8 OF 57

LKB 11/87
130610

MATCH LINE - SEE DWG. NO. G-7

NOTES:

1. FOR MAINTENANCE AND PROTECTION OF TRAFFIC ON WINDING RD. AND THE EAST PATROL RD., SEE DETAIL ON DWG. NO. G-7 .
2. FOR TRENCH RESTORATION WITHIN WINDING ROAD - SEE DWG. NO. L-1

VALVE W/ BOX
STA. 43+31

STA 43+54
EQ STA 43+20

DRAIN
STA 43+22

STA. 43+06
90° BEND

FOR ROAD CROSSING DETAIL
SEE DWG. NO. G-25

ROAD

42+00

41+00

40+00

39+00

38+00

37+00

36+00

35+00

34+00

33+00

STA. 38+38
45° BEND

STA. 35+98
45° BEND

STA. 34+58
22° BEND

AIR & VACUUM
RELEASE
STA. 33+96

BACK PRESSURE
SUSTAINING VALVE
STA. 34+42
(FOR DETAIL SEE
DWG. G-26)

VALVE W/ BOX
STA. 33+89

STA 32+31

PATROL

WINDING

RECHARGE BASIN

345 KV PIPE TYPE CABLE

138 KV PIPE TYPE CABLE

10" FRP HEADER ABOVE GROUND

10" FRP HEADER BELOW GROUND

SERVICE TO BLDG. #2

MATCH LINE - SEE DWG. NO. G-5

AS-BUILT

REV.	DATE	REMARKS	BY

LKB 11/87
138610

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

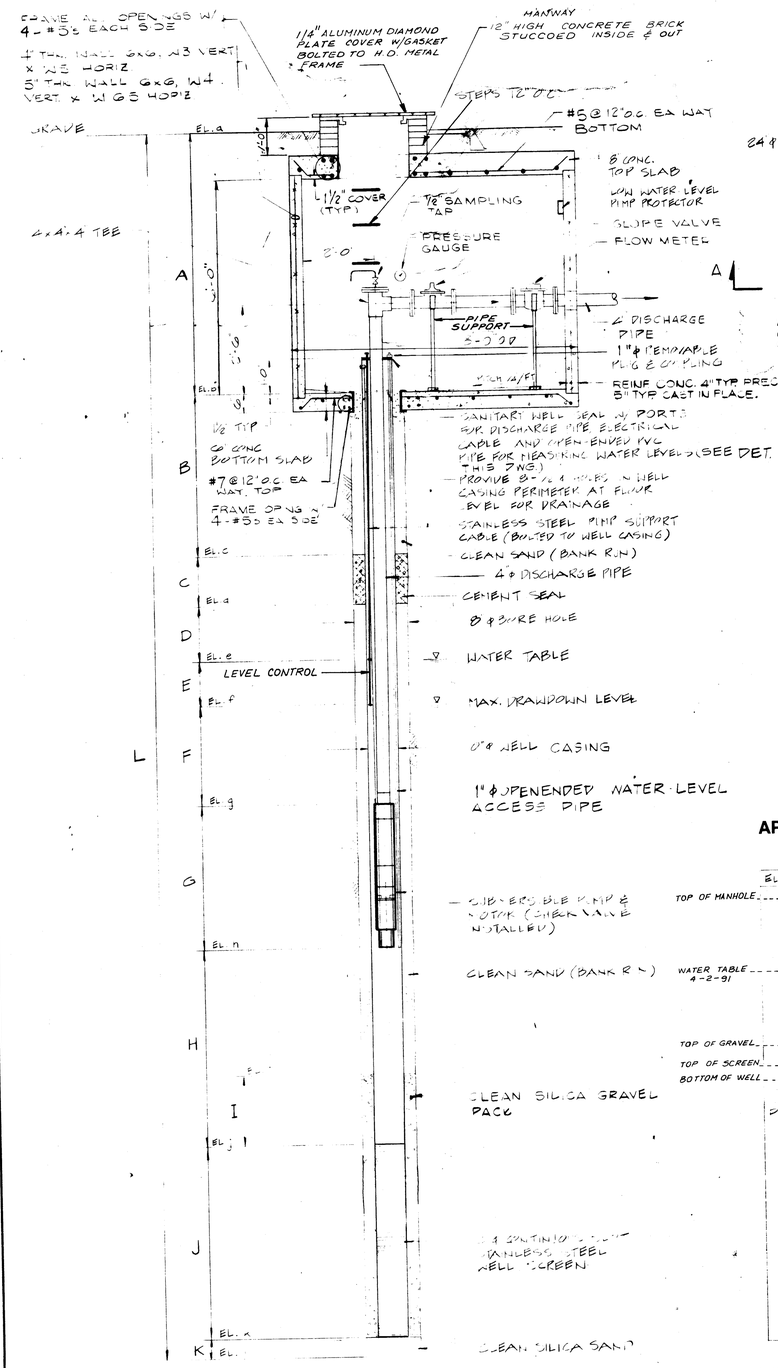
LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 — SYOSSET, NEW YORK

PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE
SITE PLAN
TRANSMISSION LINE

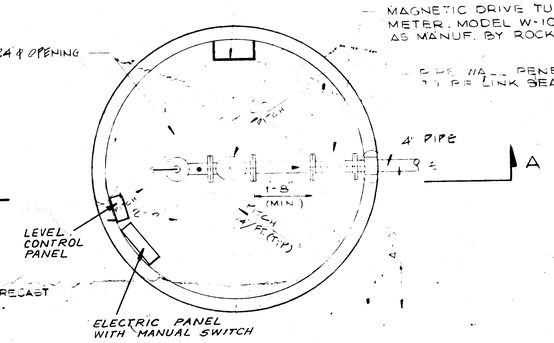
DESIGN BY:	A.W.
DRAWN BY:	R.G.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	1"=40'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-6
SHEET 9 OF 57



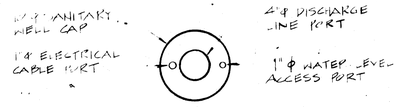
SECTION A-A

N.T.S



WELL PIT PLAN

N.T.S



SANITARY WELL SEAL DETAIL

N.T.S

APPROXIMATE ELEVATIONS & DIMENSIONS FOR THE PRODUCTION WELLS

ELEVATIONS[1]	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5
TOP OF MANHOLE — a	117.44	151.77	127.30	151.31	156.20
b	109.94	144.27	119.80	143.81	148.70
c	105.44	139.77	115.30	139.31	144.20
d	101.44	135.77	111.30	135.31	140.20
WATER TABLE 4-2-91 — e	67.69	67.35	67.13	67.39	68.62
f	62.18	60.05	55.39	61.11	61.51
g	39.44	38.77	39.30	43.31	43.20
h	41.78	39.65	34.99	40.71	41.11
TOP OF GRAVEL — i	-2.56	41.77	2.30	44.31	36.30
TOP OF SCREEN — j	-22.56	1.77	-37.70	4.31	-3.7
BOTTOM OF WELL — k	-127.56	-118.23	-127.70	-98.69	-106.80
	-162.56	-138.23	-147.70	-118.69	-126.80

DIMENSIONS[2]	WELL 1	WELL 2	WELL 3	WELL 4	WELL 5
A	7.5	7.5	7.5	7.5	7.5
B	4.5	4.5	4.5	4.5	4.5
C	4	4	4	4	4
D	33.75	68.42	44.17	67.92	71.58
E	5.51	7.30	11.74	6.28	7.11
F	15	15	15	15	15
G	5.4	5.4	5.4	5.4	5.4
H	64.34	37.88	72.69	36.4	44.81
I	20	40	40	40	40
J	105	120	90	103	103.10
K	35	20	20	20	20
L	280	290	275	270	283

NOTE:
1. ELEVATIONS ARE SHOWN IN FEET ABOVE OR BELOW (INDICATED BY NEGATIVE SIGN) DATUM
2. DIMENSIONS ARE SHOWN IN FEET

MODES OF OPERATION OF THE PRODUCTION WELLS

WELL NO (HP OF PUMP)	1 (15)		2 (15)		3 (5)		4 (5)		5 (15)		TOTAL GPM/MGD	REMARKS
WELL OPERATION	Q GPM	TDH FT	Q GPM	TDH FT	Q GPM	TDH FT	Q GPM	TDH FT	Q GPM	TDH FT		
WELLS 1+2+3+4+5 AT MAX CAPACITY	240	88	260	70	270	155	220	135	230	31	1220/1.75	ALL CONTROL VALVES OPEN
WELLS 1+2+3+4+5 AT 210 GPM EA	210	216	210	216	210	216	210	41	210	41	1050/1.50	CONTROL VALVES ADJUSTED
WELLS 1+2	260	167	270	115	-	-	-	-	-	-	530/0.75	CONTROL VALVES ADJ. BACK PRESS. SUSTAINING VALVES IN OPERATION

AS-BUILT

REV.	DATE	REMARKS	BY

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

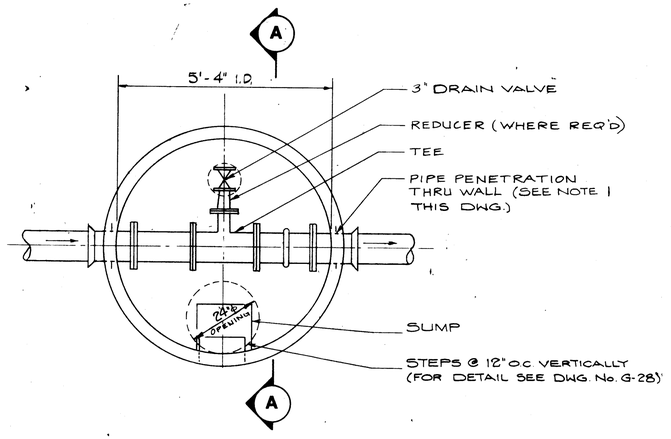
LKB 11/87

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

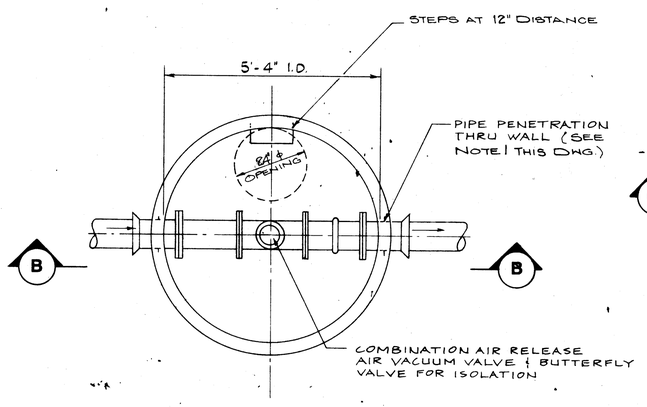
PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUNDWATER REMEDIATION PROGRAM

DRAWING TITLE
PRODUCTION WELLS
DETAILS

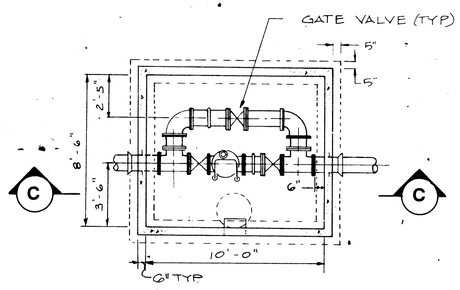
DESIGN BY:	J.S.S./G.&M.
DRAWN BY:	M.C.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	NONE
PROJECT NO.	8086-02
	PHASE 1-CONSTRUCTION
DRAWING NO.	G-18
SHEET	21 OF 57



PLAN

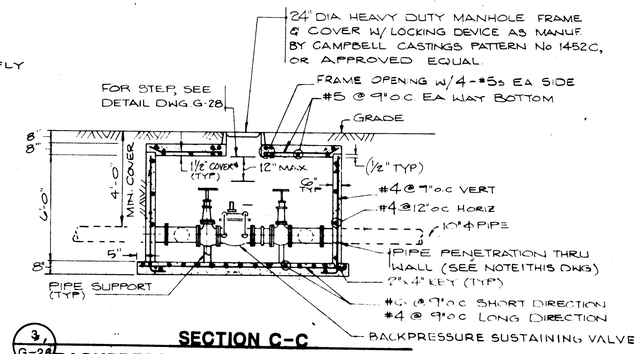


PLAN



NOTES:

1. FOR PIPE WALL PENETRATION, PROVIDE CAST IRON WALL PIPE OR USE LINK SEALS
2. PIPING WITHIN ALL VALVE PITS SHALL BE DUCTILE IRON EXTENDING TO A POINT 5'-0" OUTSIDE THE EXTERIOR WALL OF THE VALVE PITS
3. ALL PIPE FITTINGS WITHIN THE VALVE PITS SHALL BE FLANGED END TYPE
4. ON DISCHARGE LINE



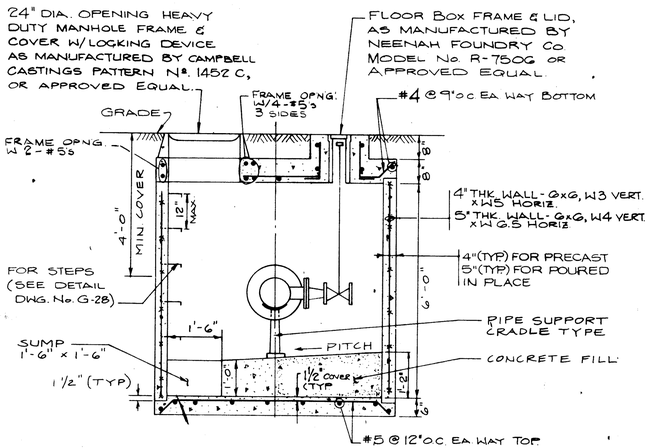
3/G-26 **SECTION C-C**

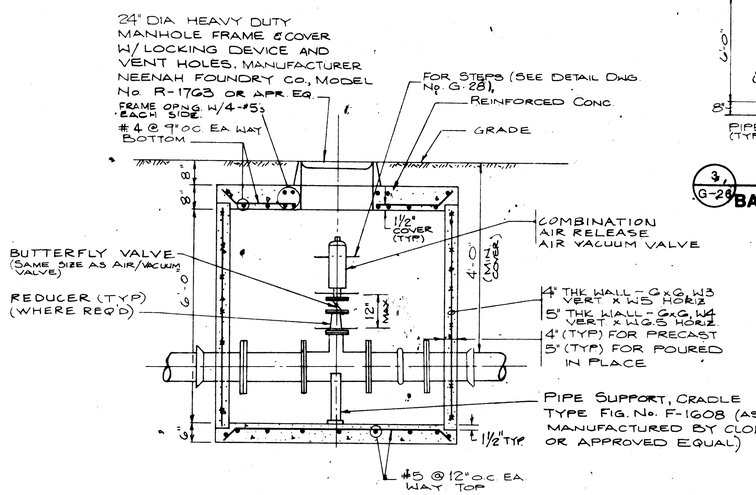
BACKPRESSURE SUSTAINING VALVE PIT

STA. 34+42

(FOR LOCATION SEE DWG G-6)

SCALE ¼"=1'-0"





1/G-26 **SECTION A-A**

DRAIN VALVE W/PIT

SCALE ½"=1'-0"

STATION	PIPE SIZE INCH	GATE VALVE INCH	TEE SIZE INCH	REDUCER INCH
12+45	8	3	8×8×4	4×3
17+87	10	3	10×10×4	4×3
20+80	10	3	10×10×4	4×3
27+83	10	3	10×10×4	4×3
43+22	10	3	10×10×4	4×3
SEE NOTE 5 → 0+38	10	3	10×10×4	4×3

2/G-26 **SECTION B-B**

AIR RELEASE VALVE W/PIT

SCALE ½"=1'-0"

STATION	PIPE SIZE INCH	AIR VALVE INCH	TEE SIZE INCH	REDUCER INCH
7+05	6	2	6×6×2	—
16+57	8	2	8×8×4	4×2
19+04	10	3	10×10×4	4×3
23+83	10	3	10×10×4	4×3
33+96	10	3	10×10×4	4×3
SEE NOTE 5 → 5+78	10	3	10×10×4	4×3

AS-BUILT

REV.	DATE	REMARKS	BY

LKB 11/87 135810

CLIENT

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LKB

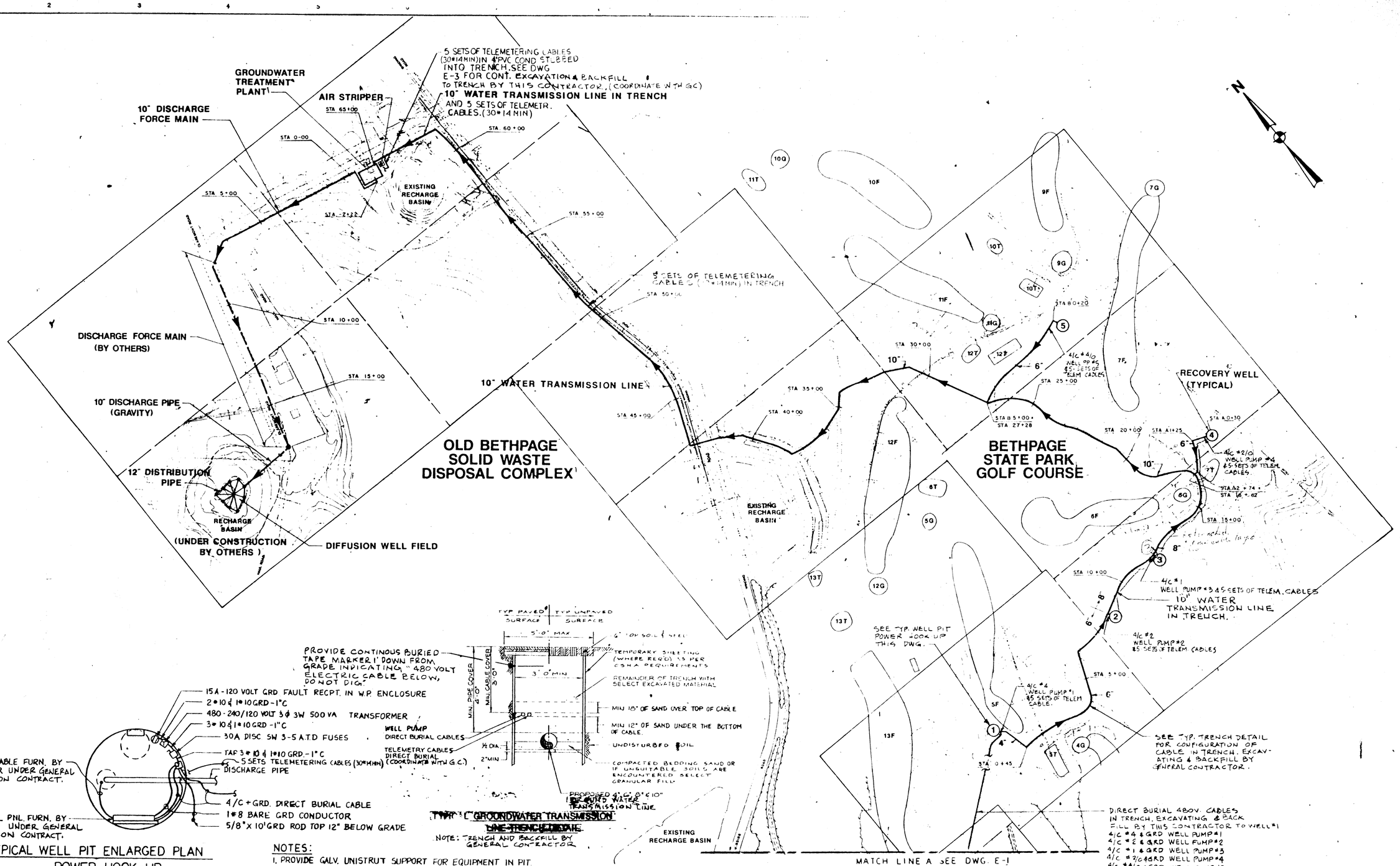
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

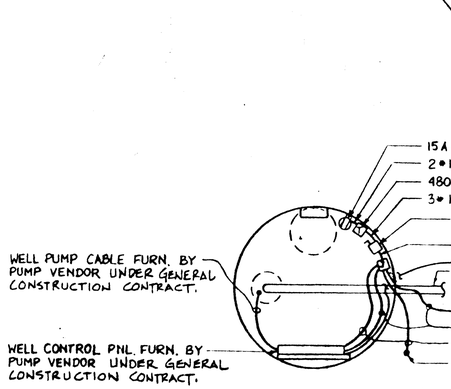
PROJECT NAME
OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
GROUNDWATER REMEDIATION PROGRAM

DRAWING TITLE
MISCELLANEOUS DETAILS II

DESIGN BY:	J.S.S.
DRAWN BY:	R.R.
CHECKED BY:	J.S.S.
DATE:	JAN. 15, 1990
SCALE:	AS SHOWN

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. G-26
SHEET 29 OF 57





TYPICAL WELL PIT ENLARGED PLAN
POWER HOOK-UP
NTS

TYP. "C" GROUNDWATER TRANSMISSION LINE TRENCH DETAIL
NOTE: TRENCH AND BACKFILL BY GENERAL CONTRACTOR

NOTES:
1. PROVIDE GALV. UNISTRUT SUPPORT FOR EQUIPMENT IN PIT.
2. SUPPORT ALL CABLES ON WALL OF PIT.
3. THIS CONTRACTOR SHALL PROVIDE ALL CONNECTIONS IN WELL PIT INCLUDING WELL PUMP & CONTROL PANEL.
4. GRD. ALL UNISTRUT IN PIT.
5. WELL PIT SHALL BE INSTALLED UNDER THE GENERAL CONSTRUCTION CONTACT. FOR DETAIL SEE DWG G-18.

REV.	DATE	REMARKS	BY

CLIENT
TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS
SYOSSET, NEW YORK

LICENSED PROFESSIONAL ENGINEER GEORGE J. KESSLER 049159 STATE OF NEW YORK

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SINCE 1889 SYOSSET, NEW YORK

PROJECT NAME
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX GROUND WATER REMEDIATION PROGRAM

DRAWING TITLE
ELECTRICAL
WELL PUMPS AND DETAILS

DESIGN BY:	E.C
DRAWN BY:	J.M.J.
CHECKED BY:	B.G.
DATE:	JAN. 15, 1990
SCALE:	1"=200'

PROJECT NO. 8086-02
PHASE I-CONSTRUCTION
DRAWING NO. E-2
SHEET 80 OF 87

LKB 1987