43513

EN-1029

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

WILMINGTON, DELAWARE 19898

ENGINEERING DEPARTMENT

CC: A. S. Jennings - Pigm. - Newport
D. J. Verrico - Pigm. - Newport
R. R. Balmer
A. C. Barlow
I. C. 13 - WR&PC

February 13, 1976

J. A. HALL
PIGMENTS DEPARTMENT
NEWPORT PLANT

PIGMENTS - NEWPORT
WASTE
LANDFILL AREA - GROUNDWATER INVESTIGATION

Attached is a report on groundwater conditions at the Plant's landfill. As pointed out, leachate from the landfill is discharged to the Christina River. The aquifer developed in plant water wells #11 and #13 does not appear to be contaminated from landfill activities.

Monitor well DM-1 is not fully developed and should be flushed out with a bailer and/or an air line until the water is mostly clear.

Measurement of water levels in monitor wells should continue, and samples for quality analysis should be taken semiannually.

ENGINEERING SERVICE DIVISION

C. R. Sherman

CRS:rbw
Atch

AR200175

NEWTON GROUND WATER OBSERVATION WELLS

GROUND WATER LEVELS CONNECTED TO SEA LEVEL

[redacted]

	SM-1	DM-1	SM-2	DM-2
	GL +21.856	GL +16.231	GL +13.273	GL +1.[illegible]
7/15	DRILLED	7/17 DRILLED	7/21 DRILLED	7/23 DRILLED
7/18	+1.35[illegible]	–	–	–
7/21	+4.93[illegible]	–	–	–
7/22	+4.159	+7.398	–	–
7/24	+4.[illegible]	-12.602	+8.856	+1.355
7/25	+1.356	-14.602	–	–
7/27	PLANT	WELLS # 11 & # 13	TURNED	ON
7/28	+3.35[illegible]	-7.352	+8.106	+2.255
7/29	+3.190	-8.519	+7.523	+2.355
7/30	+3.106	-7.602	+7.44	+2.355
7/31	+3.190	-6.764	+7.523	+2.355
8/1	+3.106	-5.019	+7.690	+2.605
8/4	+3.190	-4.269	+7.690	+3.021
8/5	+3.439	-2.[illegible]	+7.690	+3.105
8/6	–	–	–	–
8/11	+3.106	-.035	+6.94	+3.105
8/12	+3.106	+.147	+6.94	+3.105
8/13	+3.106	+.315	+6.94	+3.105
8/14	+3.106	+.398	+6.94	+3.105
8/15	+3.106	+1.231	+6.94	+3.105
8/3	–	+2.231	–	–
8/19	–	+2.451	–	–
8/20	–	+2.814	–	–
9/8	–	-5.269	–	–
12/10	+3.356	+8.481	+7.106	+2.689
12/17	+3.106	+8.398	+6.439	+2.689
1/6/76	+2.606	+8.398	+7.273	+2.521
	WELLS	PUMPED OUT AFTER	LEVELS TAKEN	1/6/76
1/6	+1.606	-13.435	+7.273	-12.810 AFTER PUMP OUT
1/14	+3.106	+.769	+7.273	+1.772
1/22	+2.606	+2.398	+6.94	+1.605
1/28	+5.106	+4.231	+8.023	+2.355
1/30	+3.356	+4.731	+8.023	+2.355 — 1:00 pm
1/30	+3.356	+4.461	+8.023	+2.355 — 3:00 pm
2/2	+3.606	+5.231	+7.856	+2.355

TURNED # 11 ON 2:00 pm

AR200176

ORIGINAL
(Red)

	CM-1	DM-1	CM-2	LM-2
	GL+21.306	GL+16.231	GL+13.273	GL+1.8559
2/4	+ 5.106	+ 5.565	+7.523	+ 2.105
2/5	+ 2.939	+ 5.731	+7.623	+ 2.105
2/6				
2/9		+ 6.397	+7.023	+1.939

AR200177

TO: C. D EVERETT, LEGAL

FROM: J. A. HALL, NAT'L

DU PONT - PIGMENTS DEPARTMENT
NEWPORT, DELAWARE

LANDFILL-GROUNDWATER INVESTIGATION

To fulfill State requirements for a groundwater investigation at Du Pont's Newport Pigments Plant landfill, four monitor wells were installed around the fill area in July, 1975. Water level measurements made in these wells at various times, plus groundwater quality data, drillers logs, and information from the Plant on its water wells, comprise the supportive data for this report.

There are three groundwater regimens identified by this report. One is a perched water table which has been developed in monitor well SM-1. Beneath this perched water are Pleistocene Age (probably Columbia) sands, gravels, and silts which are developed in monitor wells SM-2, DM-1, and DM-2. The Upper Potomac aquifer, developed in Plant water wells #11 and #13, is directly overlain by the Pleistocene aquifer. The shallow perched water table, monitored in well SM-1, is very responsive to direct infiltration of rainfall through the landfill. Water levels are seen to rise and fall fast, indicating that infiltrated water is quickly discharged to the Christina River or other surface outlets. There may also be some recharge to this perched water from the underlying Pleistocene aquifer through a leaky aquitard. Some evidence exists for this in the similarity of potentiometric surface of the monitor wells over a long period of time. Contaminants in groundwater from the landfill are mostly discharged to the Christina River or through wet weather springs to the River.

Beneath the shallow surficial aquifer are brown sands, gravels, and silts of Pleistocene Age that along with reworked Potomac sediments have been deposited in alternating, connected, and unconnected lenses. This aquifer offers little potential for development of groundwater due to its heterogenity of sediments and its probable limited areal extent. There does not appear to be any influence from rainfall on monitor wells SM-2, DM-1, and DM-2 as seen in monitor well SM-1. Also, there does not appear to be any influence on the water levels in the monitor wells from pumping plant water wells #11 or #13.

The Upper Potomac aquifer is penetrated in Plant water wells #11 and #13. This aquifer is composed of varigated colored sands, gravels, and silts and has a higher potentiometric surface than either of the overlying aquifers. Because of the nature of the Potomac and Pleistocene sediments, it is not improbable that water from the Upper Potomac aquifer moves upward through a leaky aquitard into the overlying Pleistocene aquifer. Water in the Upper Potomac aquifer does not appear to have been contaminated from the Plant's landfill operations.

ORIGINAL
(Red)

Continued monitoring of water levels and quality in landfill monitor wells and plant water wells will be continued.

Supportive data attached -

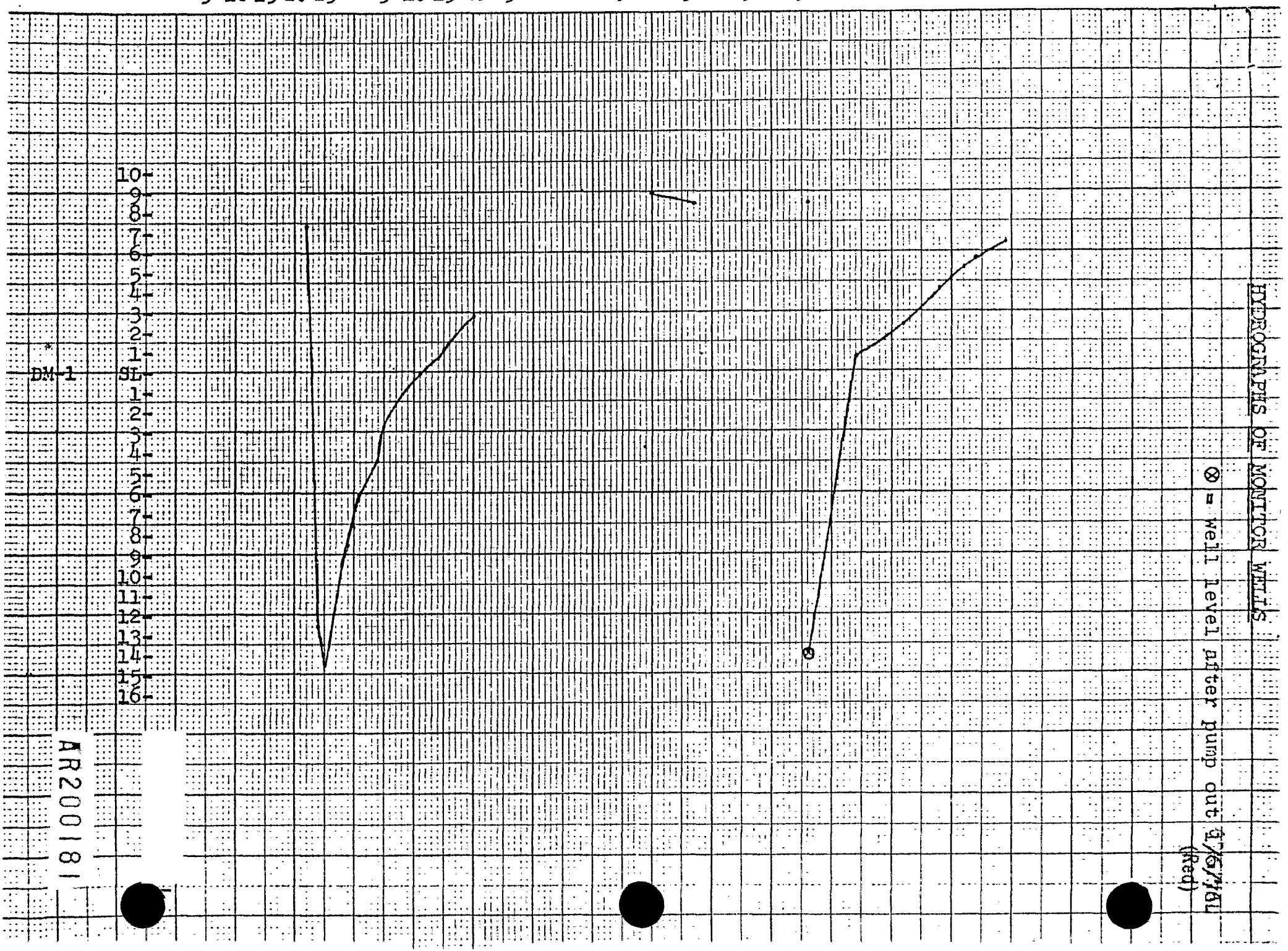
(a) Hydrographs of monitor wells
(b) Groundwater contour maps
(c) Schematic section of monitor wells and water wells
(d) Groundwater levels adjusted to sea level
(e) Driller's logs of monitor wells
(f) Water quality analysis

CRS:rbw
2/13/76

HYDROGRAPHS OF MONITOR WELLS

⊗ = well level after pump out 1/6/76

AR200180


JULY
5 10 15 20 25
AUGUST
5 10 15 20 25
DECEMBER
5 10 15 20 25
JANUARY
5 10 15 20 25
FEBRUARY
5 10 15 20 25
10
9
8
7
6
5
4
3
2
1
DM-1 SL
1
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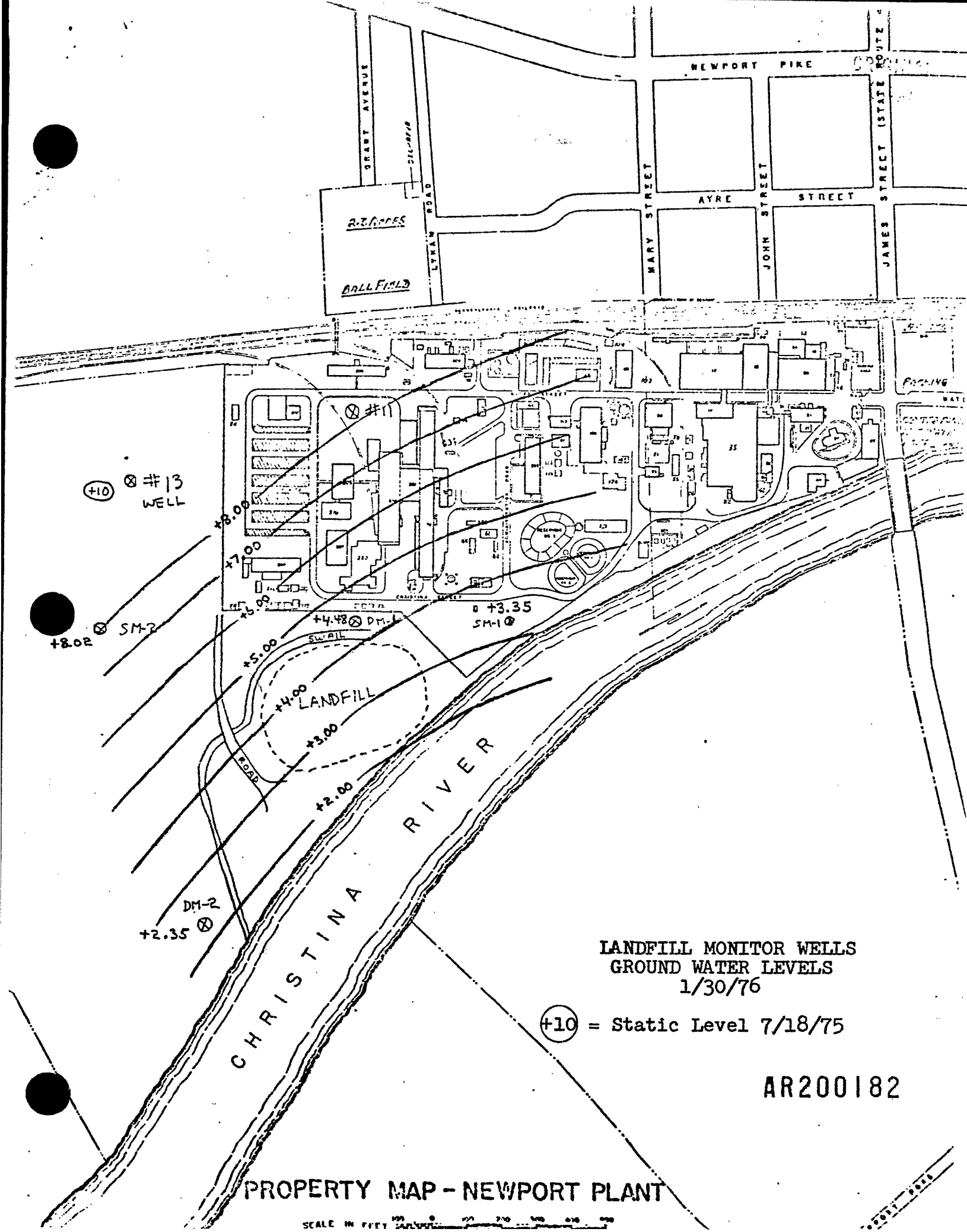
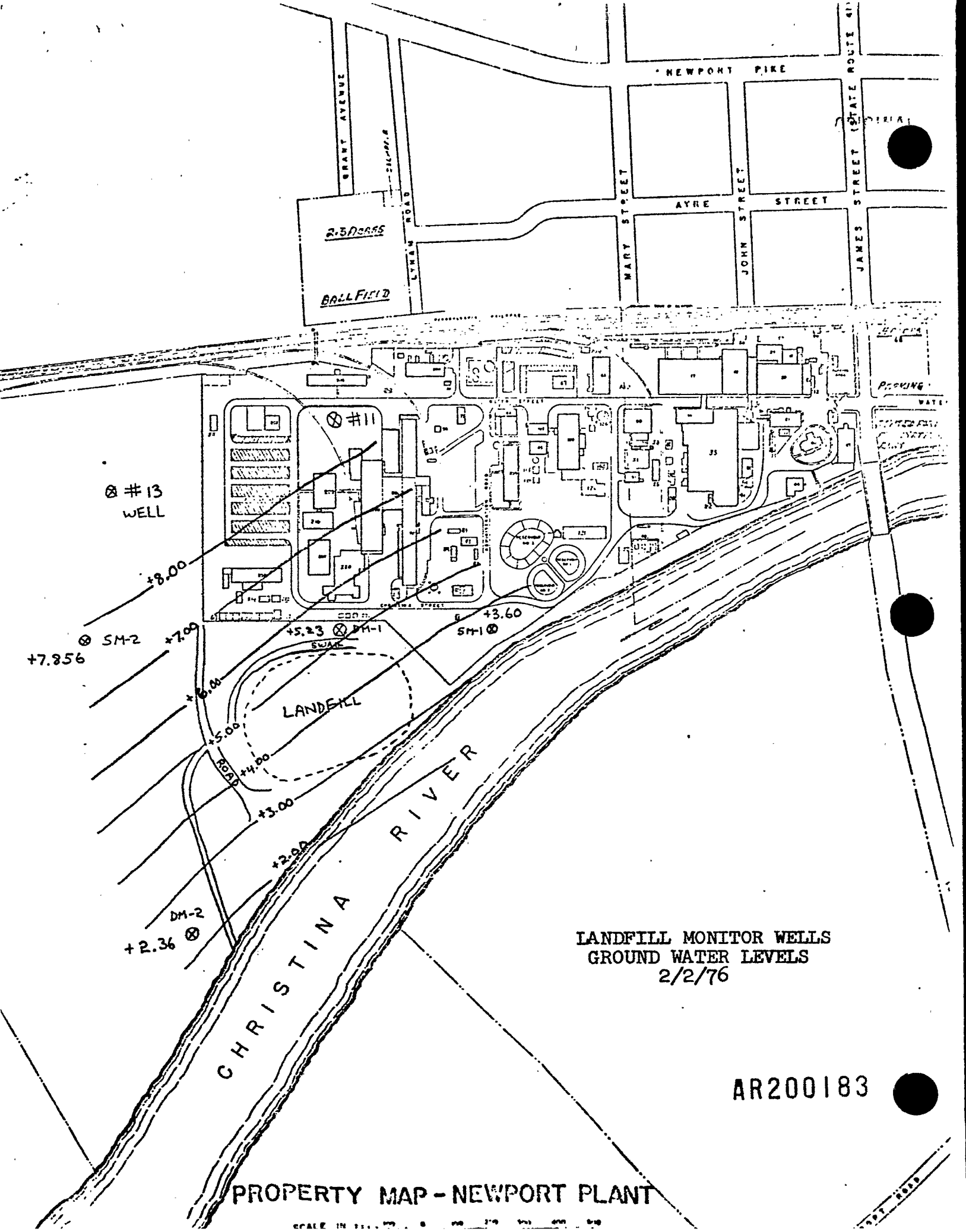
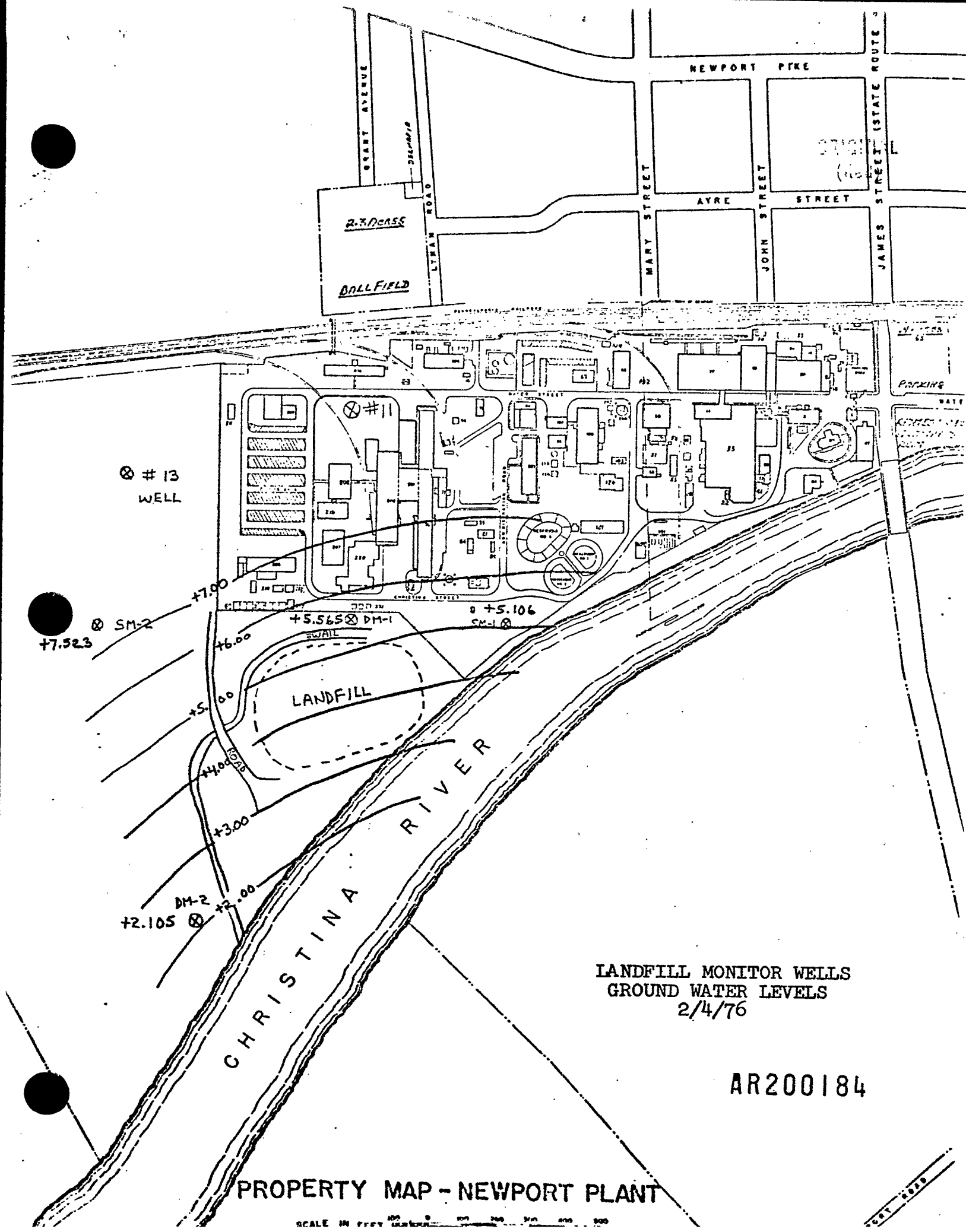
15
16
HYDROGRAPHS OF MONITOR WELLS
⊗ = well level after pump out 1/6/81
(Red)
AR200181


NEWPORT PIKE
GRANT AVENUE
LYNN ROAD
MARY STREET
AYRE STREET
JOHN STREET
JAMES STREET (STATE ROUTE 4)
BALL FIELD
#11
+10
#13
WELL
+8.00
+7.00
+6.00
+5.00
+4.00
+3.00
+2.00
+8.02
SM-2
+4.48
DM-1
+3.35
SM-1
SWALE
LANDFILL
ROAD
DM-2
+2.35
CHRISTINA RIVER
LANDFILL MONITOR WELLS
GROUND WATER LEVELS
1/30/76
+10 = Static Level 7/18/75
AR200182
PROPERTY MAP - NEWPORT PLANT
SCALE IN FEET


NEWPORT PIKE
STATE ROUTE 41
GRANT AVENUE
LYMAN ROAD
MARY STREET
JOHN STREET
JAMES STREET
AYRE STREET
2.5 ACRES
BALL FIELD
PARKING
#11
#13 WELL
+8.00
+7.00
+6.00
+5.00
+4.00
+3.00
+2.00
SM-2
+7.856
+5.23
DM-1
SWAMP
+3.60
SM-1
LANDFILL
ROAD
DM-2
+2.36
CHRISTINA RIVER
LANDFILL MONITOR WELLS
GROUND WATER LEVELS
2/2/76
AR200183
PROPERTY MAP - NEWPORT PLANT


NEWPORT PIKE
GRANT AVENUE
LYMAN ROAD
MARY STREET
JOHN STREET
JAMES STREET
STATE ROUTE
AYRE STREET
BALL FIELD
PARKING
#11
13
WELL
+7.00
+7.523
SM-2
+5.565
DM-1
+5.106
SM-1
SWALE
+6.00
LANDFILL
+5.00
+4.00
ROAD
+3.00
+2.00
DM-2
+2.105
CHRISTINA
RIVER
LANDFILL MONITOR WELLS
GROUND WATER LEVELS
2/4/76
AR200184
PROPERTY MAP - NEWPORT PLANT
SCALE IN FEET

NEWPORT GROUND WATER OBSERVATION WELLS
GROUND WATER LEVELS CORRECTED TO SEA LEVEL

ORIGINAL (Re

	SM-1 GL+21.356 7-15 Drilled	DM-1 GL+16.231 7-17 Drilled	SM-2 GL+13.273 7-21 Drilled	DM-2 GL+ 1.8559 7-23 Drilled	
7-18	+ 1.356	--	--	--	
7-21	+ 4.939	--	--	--	
7-22	+ 4.189	+ 7.398	--	--	
7-24	+ 4.028	-12.602	+ 8.856	+ 1.355	
7-25	+ 1.356	-14.602	--	--	
7-27	Plant wells #11 and #13 turned on				
7-28	+ 3.356	- 9.352	+ 8.106	+ 2.355	
7-29	+ 3.190	- 8.519	+ 7.523	+ 2.355	
7-30	+ 3.106	- 7.602	+ 7.44	+ 2.355	
7-31	+ 3.190	- 6.769	+ 7.523	+ 2.355	
8-1	+ 3.106	- 6.019	+ 7.690	+ 2.605	
8-4	+ 3.190	- 4.269	+ 7.690	+ 3.021	
8-5	+ 3.439	- 2.852	+ 7.690	+ 3.105	
8-6	--	--	--	--	
8-11	+ 3.106	- .035	+ 6.94	+ 3.105	
8-13	+ 3.106	+ .398	+ 6.94	+ 3.105	
8-14	+ 3.106	+ .398	+ 6.94	+ 3.105	
8-15	+ 3.106	+ 1.231	+ 6.94	+ 3.105	
8-18	--	+ 2.231	--	--	
8-19	--	+ 2.481	--	--	
8-20	--	+ 2.814	--	--	
9-8	--	- 5.269	--	--	
12-10	+ 3.356	+ 8.981	+ 7.106	+ 2.689	
12-17	+ 3.106	+ 8.398	+ 6.439	+ 2.689	
1-6-76	+ 2.606	+ 8.398	+ 7.273	+ 2.521	
	Wells pumped out after levels taken 1-6-76				
1-6	+ 1.606	-13.935	+ 7.273	-12.810	after pum out
1-14	+ 3.106	+ .769	+ 7.273	+ 1.772	
1-22	+ 2.606	+ 2.398	+ 6.94	+ 1.605	
1-28	+ 5.106	+ 4.231	+ 8.023	+ 2.355	
1-30	+ 3.356	+ 4.731	+ 8.023	+ 2.355	- 1:00 p.m
	Turned on #11 on 1-30 at 2:00 p.m.				
	+ 3.356	+ 4.481	+ 8.023	+ 2.355	- 3:00 p.m
2-2	+ 3.606	+ 5.231	+ 7.856	+ 2.355	
2-4	+ 5.106	+ 5.565	+ 7.523	+ 2.105	
2-5	+ 2.939	+ 5.731	+ 7.523	+ 2.105	
2-6	--	--	--	--	
2-9	--	+ 6.397	+ 7.023	+ 1.939	

AR200185

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME DuPont Company PROJECT NO.

New Port, Delaware SUPERVISOR

BORING NO.	DRILLER	DATE
SH-1	R. Erickson	7-15-75
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cloudy, Hot, Humid		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A
			0	1.0	Brn. Silt w/Veg. (Top Soil)	
S - 1	0	2.0		1.5	Top Brn. Silt (Rec. 2.0)	SHELBY
			1.5		Bottom Cinder Fill	
S - 2	2.0	4.0		3.4	Top Cinder Fill (Rec. 2.0)	SHELBY
			3.4		Bottom Brn. Silt, Sand & Gravel	
S - 3	4.0	4.6			Same as S-2 Rec. 0.6	SHELBY
S - 4	5.0	5.7			Cinder Fill Rec. 0.7	SHELBY
S 5	6.0	6.8			Misc. Fill (Cinders, Red Brick)	SHELBY
					(Rec. 0.8)	
S - 6	8.0	8.7			Same as above Rec. 0.7	SHELBY
1	10.0	12.0			Same (Wet)	
2	12.0	14.0			Misc. Fill (Cinders, Greenish Blue	
					Silty Sand & Gravel) Wet	
3	14.0	16.0			Same	
4	16.0	17.0		16.5	Same	
			16.5		Brn. Med. Sand w/Gravel Tr. Silt	100/1.0
5	18.0	19.3		20.0	Same as above (Wet)	100/1.3
6	20.0	21.5	20.0		Brn. & Gray Med. Sand w/Some	100/1.5
					Silt & Mica Tr. Gravel	
7	22.0	24.0		24.0	Brn. Med. Sand & Gravel (Wet)	
					w/Some Silt	

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
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49-50
50-51
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59-60
60-61

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches

AR200188

REMARKS: Drilling water used @ 5.0

Screen: 2"x4' Sch. 80 P.V.C. .010 Slot 17.0-21.0

Gravel Pack: Morie #2 15.0-21.0

Grout: Bentonite Pellets 13.0-15.0

Cement 0 - 13.0

GROUND WATER

16.8	before curing
19.0	after curing

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME DuPont Company PROJECT NO.

Newport, Del. SUPERVISOR

BORING NO.	DRILLER	DATE
SM-2	S. Williams	7-21-75
WEATHER Clear, Hot, Humid	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0	7.0	Brn. Silt			
			7.0		Gray Clayey Silt			
S-1	8.0	10.0		9.0	Top: Gray Clayey Silt		SHELBY	
			9.0	10.5	Brn. & Lt. Brn. Micaceous Silt			
S-2	10.0	12.0	10.5	13.0	Brn. & Dk. Brn. M/C Sand w/some			
					Gravel & Micaceous Silt (Wet)			
1	14.0	16.0	13.0	17.5	Brn. & Dk. Brn. M/C Sand &			
					Gravel w/Some Silt			
2	19.0	21.0	17.5	22.5	Brn. Micaceous Silt w/Layer of			
					Coarse Sand & Gravel (Wet)			
3	24.0	25.0	22.5	24.5	Brn. M/C Sand & Gravel w/Some			
					Silt (Wet)			
			24.5	25.0	Gray Silt w/Layer of Fine Sand			

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
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59-60
60-61

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

MARKS: Wet on Rod @ 11.0 AR200187

Screen: 2"x4' Sch. 80 P.V.C. .010 Slot 21.0-25.0

Gravel Pack: Morie #2 19.0-25.0

Grout: Bentonite Pellets 17.0-19.0

Cement 0 - 17.0

GROUND WATER

WALTON CORPORATION

Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

ORIGINAL

BORING LOG

NAME DuPont Company PROJECT NO.

Newport, Del. SUPERVISOR

BORING NO.	DRILLER	DATE
DM-1	R. Erickson	7-16-75
WEATHER	**SURFACE ELEVATION**	**DATUM**
Cloudy & Hot		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
			0		Brn. Silt w/Some Sand & Gravel			
S-1	0	2.0		2.0	" " " " " " "	SHELBY		
					(Rec. 1.5)			
(Auger Sample			2.0		Lt. Brn. Silt w/Gravel			
				3.0	Some Brn. Clay Some Fill(Brick)			
			3.0		Brn. & Gray Silt & Gravel w/Some			
		4.0		5.0	Fill & Gray Silty Clay			
2	5.0		5.0		Brn. & Gray Silt w/Tr. Red Brick & Clay	Auger Sample		
3	6.0			6.5	Same as above	"		"
4	7.0		6.5		Brn. & Gray Silt	"		"
5	7.5			8.0	Same as above	"		"
6	8.0	10.0	8.0	10.0	Variegated Silt w/Some Clay Tr.	Spoon		
					Gravel (Slightly Plastic)			
7	10.0	12.0	10.0		Variegated Clay	Spoon		
S-2	12.0	14.0			Variegated Clay (Rec. 1.8)	SHELBY		
S-3	14.0	16.0		18.5	Brn. & Gray Clay (Rec. 2.0)	SHELBY		
8	19.0	21.0	18.5		Gray Clayey Silt w/Tr. Sand & Organics	Spoon		
	21.0			23.5	Same No Organic	Wash Sample		
	23.0		23.5	24.0	Gray Clayey Silt w/Brn.Sand	"		"
9	24.0	26.0	24.0	26.5	Brn. Silt,Sand & Gravel Tr. Clay	Spoon		
	26.0		26.5		Brn. Coarse Sand & Grav. Some Silt	Wash Sa		
	28.0			38.0	Brn. Coarse Sand & Grav. Some Silt	"		"

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: AR200188

GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
11-12
12-13
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57-58
58-59
59-60
60-61

WALTON CORPORATION
Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME DuPont Comapny PROJECT NO.

New Port, Delaware SUPERVISOR

BORING NO.	DRILLER	DATE
DH-1 Cont.	P. Dickson	7-17-75
WEATHER	SURFACE ELEVATION	DATUM

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
10	39.0	41.0	39.0	42.0	Variegated Fine Silty Sand w/Some			
					Clay Tr. Gravel			
11	44.0	46.0	42.0		Variegated Med. to Coarse Silty			
					Sand w/Tr. Clay (Wet)			
12	49.0	51.0		53.0	Variegated Fine Silty Sand w/Tr.			
					Clay (Wet)			
13	54.0	56.0		56.0	Variegated Coarse Sand w/Gravel			
					&Clay (Sticky)			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

* B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: Screen: 2"x4' Sch. 80 P.V.C. .020 Slot AR300089

Gravel Pack: Morie #2 25.0-31.0

Grout: Bentonite Pellets 23.0-25.0

Cement: 0 - 23.0

GROUND WATER

BLOWS ON CASING B
0- 1
1- 2
2- 3
3- 4
4- 5
5- 6
6- 7
7- 8
8- 9
9-10
10-11
11-12
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WALTON CORPORATION

Drilling Contractor

P. O. BOX 1097, NEWARK, DELAWARE 19711

BORING LOG

NAME DuPont Company **PROJECT NO.**

New Port, Delaware **SUPERVISOR**

BORING NO.	DRILLER	DATE
DM-2	R. Erickson	7-23-75
WEATHER	**SURFACE ELEVATION**	**DATUM**
Clear, Hot & Humid		

Sample No.	Sample Depth - Feet From	Sample Depth - Feet To	Depth Strata Feet From	Depth Strata Feet To	Driller's Description of Materials	*Blows A		
S-1	0	2.0	0		Gray Silty Clay w/Organic	SHELBY		
					Rec. 2.0			
S-2	2.0	4.0			Same as above (Rec. 1.3)	Shelby		
1	4.0	6.0			Same as above Sticky			
2	9.0	11.0		10.5	Same as above			
			10.5		Brn. Peat w/Some Silty Clay			
3	14.0	16.0		15.5	" " " " " "			
			15.5	19.0	Gray Silty Clay (Wet)			
4	19.0	21.0	19.0	22.5	Gray Sandy Silt w/Lens of Some Clay			
					Layer of Coarse White Sand (Wet)			
5	24.0	26.0	22.5	25.0	Fine to Med. Variegated Silty			
					Sand (Wet)			
			25.0	29.0	Red Clay (Stiff)			
6	29.0	31.0	29.0	33.0	Variegated Silty Sand (Wet)			
7	34.0	36.0	33.0	39.5	Variegated Clayey Sand (Wet)			
8	39.0	41.0	39.5	44.0	Variegated Silty Sand w/Some Clay (Wet)			
9	44.0	46.0	44.0	49.0	Pink Silty Clay			
10	49.0	51.0	49.0	50.5	Variegated Silty Sand (Wet)			
			50.5	51.0	Brn. Silt w/Fr. Gravel			

*A Number of blows of 140 lb. hammer dropped 30 in. required to drive 2 in. split-spoon sampler for each of three 6 in. increments.

*B Number of blows of 300 lb. hammer dropped 18 in. required to drive ..... in. casing 12 inches.

REMARKS: Screen: 2"x5' Sch. 80 P.V.C. .010 Slot 20 AR300190

Gravel Pack: Morie #2 18.0-25.0

Grout: Bentonite Pellets 16.0-18.0

Cement: 0 - 16.0

GROUND WATER

BLOWS ON CASING B
0-1
1-2
2-3
3-4
4-5
5-6
6-7
7-8
8-9
9-10
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BRANDT
ASSOCIATES INC.
CONSULTING
ANALYTICAL
CHEMISTS

50 BLUE HEN DRIVE
BLUE HEN INDUSTRIAL PARK
NEWARK, DELAWARE 19713
PHONE (302) 731-1550

ORIGINAL

INVOICE NO.:

LOG NO.: 79W (6/3/75)

REPORT TO

Mr. Jerry Schwartz
E. I. duPont de Nemours & Co., Inc.
Pigments Dept.
Newport, DE 19804

date report completed 6/10/75

Alan R. Yasser
Director of Lab Services

SAMPLE IDENTIFICATION	well #11	well #13
ANALYZED FOR	RESULTS (mg/l UNLESS INDICATED OTHERWISE)	
Arsenic	0.001	0.002
Barium	0.05	0.05
Cadmium	0.02	0.02
Hexavalent Chromium	0.005	0.005
Total Chromium	0.21	0.05
Cobalt	0.05	0.05
Copper	0.29	0.05
Cyanide	0.11	0.11
Iron	0.05	0.05
Lead by extraction	0.73	0.01
Mercury	0.0002	0.0002
Nickel	0.05	0.05
BOD	1	1
COD	1	1
Tin	0.5	0.5
Selenium	0.026	0.007
Zinc	0.32	2.7

AR200191

Analytical Chemists

Date Received January 2, 197

50 Blue Hen Drive
Blue Hen Industrial Park
Newark Delaware 19713
Tel (302) 731-1550

Mr. Jim Hall
E. I. du Pont de Nemours & Co., Inc.
Newport Plant
Wilmington, DE 19804

Date Analysis Completed January 19, 1976

Director of Laboratory Services

Log Number	Sample Description
34X-1	DM-1
34X-2	DM-2
34X-3	Sm-1
34X-4	Sm-2

Results (mg/l unless indicated otherwise)

Sample Log Number	34X-1	34X-2	34X-3	34X-4		
Acidity (as Ca CO_3)						
Alkalinity (as Ca CO_3)						
Aluminum						
Antimony						
Arsenic	<0.001	0.004	0.003	0.001		
Barium	0.8	1.5	21.0	<0.2		
Boron						
Cadmium	0.002	<0.001	0.008	<0.001		
Calcium						
Total Organic Carbon						
Chloride						
Chromium, Total	0.36	<0.05	<0.05	<0.05		
Hexavalent Chromium	0.023	0.025	0.038	0.013		
Cobalt	<0.05	0.34	<0.05	<0.05		
Fecal Coliform (col/100ml)						
Total Coliform (col/100ml)						
Copper	<0.05	<0.05	<0.05	<0.05		
Cyanide	<0.1	<0.1	<0.1	<0.1		
Fluoride						
Hardness (Ca, Mg as Ca CO_3)						
Iron	5.33	6.20	9.13	1.67		
Lead	0.08	0.02	0.05	<0.02		
Magnesium						
Manganese						
Mercury	0.0009	0.0013	0.0004	0.0007		
Molybdenum						
Nickel	0.17	0.22	0.11	<0.05		
Nitrate as N						
Nitrite as N						
Ammonia Nitrogen as N						
Total Kjeldahl Nitrogen as N						
Tin	<0.5	<0.5	<0.5	<0.5		
Selenium	0.0067	0.002	0.0014	0.010		
Zinc	0.26	4.60	1.50	0.19		

AR200192