

COMPLIANCE REPORT
DETECTION GROUNDWATER MONITORING SYSTEM
COAL COMBUSTION RESIDUALS LANDFILL
INDIAN RIVER GENERATING STATION

Prepared for:



Indian River Power, LLC
Indian River Generating Station
Dagsboro, Delaware

Prepared by:



October 17, 2017

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1.0 Introduction

This report has been prepared for NRG Indian River Power LLC (NRG) to support certification that the groundwater monitoring system at their Indian River Generating Station Coal Combustion Residuals (CCR) Landfill meets the requirements of the United States Environmental Protection Agency (USEPA) CCR Rule for Detection Groundwater Monitoring. Title 40 of the Code of Federal Regulations (CFR) §257.91 requires owners or operators of CCR landfills (also known as CCR units) to implement a groundwater monitoring system. The requirements were published in the Federal Register on April 17, 2015 and became effective on October 19, 2015. The groundwater monitoring system for each CCR unit must consist of a sufficient number of wells (minimum of one upgradient and three downgradient per §257.91(c)(1)). The performance standards in §257.91(a)(1-2) require the wells to be installed at appropriate locations that enable an accurate characterization of background groundwater quality and the quality of groundwater passing the downgradient boundary of the CCR unit. Their ability to satisfy these requirements must be documented and certified by a Registered Professional Engineer in accordance with §257.91(f).

The station generating capacity was developed between 1957 (Unit 1) and 1980 (Unit 4). The current landfill (Phase I) began operation in 1981 with approval from the State of Delaware and has, with the addition of Phase II, continued operation as a permitted entity to the present. Its current permit to operate was issued by Delaware Department of Natural Resources and Environmental Control (DNREC) as Permit No SW-12/01 (Jan 24, 2007, subsequently amended Feb 27, 2012 and Nov 6, 2015) and includes a rigorous groundwater monitoring program requirement with which the facility is compliant. The USEPA Part 257 regulations regarding CCR disposal units became effective Oct 19, 2015 and contain substantially equivalent obligations, some of which currently are not fully synchronized with the existing State program. It is anticipated that these differences will be resolved into a combined state/federal program that includes permit conditions similar to those currently in place.

Groundwater has been monitored at the landfill site for more than 35 years and there is a substantial body of data greatly exceeding that needed to make the demonstrations required in Part 257.94 (Detection Monitoring Program). Nonetheless, the facility has invested the necessary resources to ensure that the quantity and quality of data available meets the specific detailed requirements of Part 257.90-94.

This report addresses primarily the requirements of §257.91 - Groundwater monitoring systems. These, in summary, are:

Install a groundwater monitoring system yielding samples that:

Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit, and

Accurately represent the quality of groundwater passing the (downgradient) waste boundary of the CCR unit

More detailed requirements and the measures taken to ensure that they are satisfied are discussed in subsequent sections of the report which documents the design and construction of the detection groundwater monitoring system and includes certification by a Registered Professional Engineer.

The certification will be placed in the facility's operating record per §257.105(h)(3), noticed to the State Director per §257.106(h)(2), and posted to the publicly accessible internet site per §257.107(h)(2).

2.0 Site Description

The CCR landfill is located within the 1200-acre plant property at the Indian River Generating Station near the city of Dagsboro, in Sussex County, Delaware. Non-hazardous coal combustion residuals (CCR) that result from burning coal at the station are disposed in the landfill, located about one half of a mile south of the station. The landfill is separated from the generating station proper area by Island Creek as shown on Figure 1.

The station originally operated four generating units with nominal capacities of 90, 90, 165 and 424 megawatts (Units 1 through 4 respectively). Units 1 through 3 have been retired from service and the fourth unit currently operates intermittently. During 2016 it operated at about 13% capacity. It produces fly ash, bottom ash, and a flue gas desulfurization (FGD) byproduct which must be removed from the power plant, hauled to the designated disposal area, or hauled to an off-site utilization project.

The CCR landfill consists of two distinct disposal areas, the original (Phase I) landfill that is now closed, and the two currently operating cells that comprise the Phase II landfill. The original 43.8-acre disposal area or Phase I landfill was closed in 2011. The Phase II landfill consists of two, lined cells with a total area of 25.5 acres, immediately west of the closed Phase I cell (Cell 1 is to the south and Cell 2 to the north). The eastern 6.2 acres of the Phase II landfill will be built over, or piggy-back, the western slope of the Phase I landfill with its liner system separating the two phases of disposal. This will raise the overall landfill to a maximum elevation of 100 feet (ft) from the current 65 ft.

Construction of the Phase I cell was initiated in 1979 and disposal commenced in 1980. Waste contains primarily fly ash and bottom ash and, to a lesser extent, wastewater treatment sludge, water treatment sludge, coal pile runoff sump area sludge, coal pyrites, cooling tower sediment sludge, and construction debris produced at the plant. The Phase I Landfill is unlined and was formally closed in 2011 with a cover system that consists of a geosynthetic membrane with a vegetated soil cover. The Delaware Department of Natural Resources and Environmental Control (DNREC) approved the Phase I closure October 14, 2014. The Phase I cell is currently in post closure care.

The Phase II Landfill liner system has a geosynthetic membrane and a leachate collection system. Leachate collected in Cell 1 is transported via gravity to a collection sump on the south side of the landfill where it is then pumped to leachate holding tanks located approximately 1,700 ft due west. Leachate collected in Cell 2 flows by gravity to a collection sump on the north side of the landfill where it is then pumped to leachate holding tanks

Other integral components of the CCR unit as shown on Figure 1 include:

- Two sedimentation basins (the North and Southwest Sedimentation Basins) collect surface water runoff from the landfill and prevent or minimize the flow of turbid water into Island Creek.
- The North Sedimentation Basin has interior bermed areas (east and west forebays) near the points of inflow into the basin. These interior bermed areas are approximately 150 x 150 ft square, each, and about five feet high. They are used to contain the distribution of sediments within the basin and facilitate clean out. Sediments are cleaned out from this interior basin, as needed.
- Haul roads used for transporting CCRs from the plant to the landfill.
- The stream gauging station is used for monitoring surface water quality in Island Creek.
- The groundwater monitoring wells are used to measure water levels and select wells are sampled to monitor upgradient and downgradient groundwater.
- Production wells are used by the plant to generate water for various industrial purposes (e.g., cooling water and dust control).

2.1 Site Geology

The geology in the vicinity of the CCR landfill was described in *Hydrogeologic Studies - 1984 Update*, prepared by Michael Baker, Jr., Inc. (Michael Baker), 1984, as:

The disposal site is underlain by the Columbia sand deposits (Pleistocene age) which blanket the entire central and southern portions of the State. These deposits range in the thickness from less than 50 to over 125 feet in southern Delaware (Johnston, 1972) and are comprised of predominantly medium-grained sand with varying mixtures of silt and gravel. In the landfill area, the Columbia deposits are approximately 100 to 110 feet thick and have been found to consist of relatively homogeneous sand throughout their entire thickness... They are generally classified as either SP-SM or SW-SM soils according to the Unified Soil Classification System which translates to moderately well-to-poorly sorted sand with minor amounts of silt.

Relatively deep test wells drilled during exploration for water production wells A and B a few hundred feet southwest of the CCR unit encountered lenses or pockets of green silty clay interspersed with coarse sand below 110 feet (Gilbert Associates, Inc., 1980). These lenses have been assumed to mark the upper boundary of Miocene-age sediments at the site. The Miocene sediments generally consist of sand units interbedded with silty clay layers. According to Johnston (1972), the Miocene sands may directly underlie Pleistocene sands, making differentiation between the two difficult. Thus, some of the upper Miocene sands may have been identified at the site as Columbia deposits. However, it is apparent that silty clay is present below an elevation of approximately -75 to -90 ft in the site area.

More than 90% of the state lies on the Coastal Plain physiographic province, a wedge-shaped deposit of alternating layers of sand and clay that overlies crystalline basement rocks and increases in thickness to the southeast where it reaches a thickness of 15,000 ft (USGS, 1985). The sand units form important aquifers that are relied on throughout the state for public water supply, agricultural irrigation and industrial needs. The sequence of successively deeper confined units in the site area includes the Pokomoke-Ocean City, Manokin, Cheswold and Piney Point aquifers, the deepest of which is in the range of 800 - 1000 ft below sea level. A surficial blanket of sand, typically on the order of 100 ft in thickness, overlies much of the state and supports an unconfined aquifer below which the deeper confined units subcrop in sequence to the northwest. It is this surficial unit that forms the uppermost aquifer at the Station and towards which the monitoring efforts are directed.

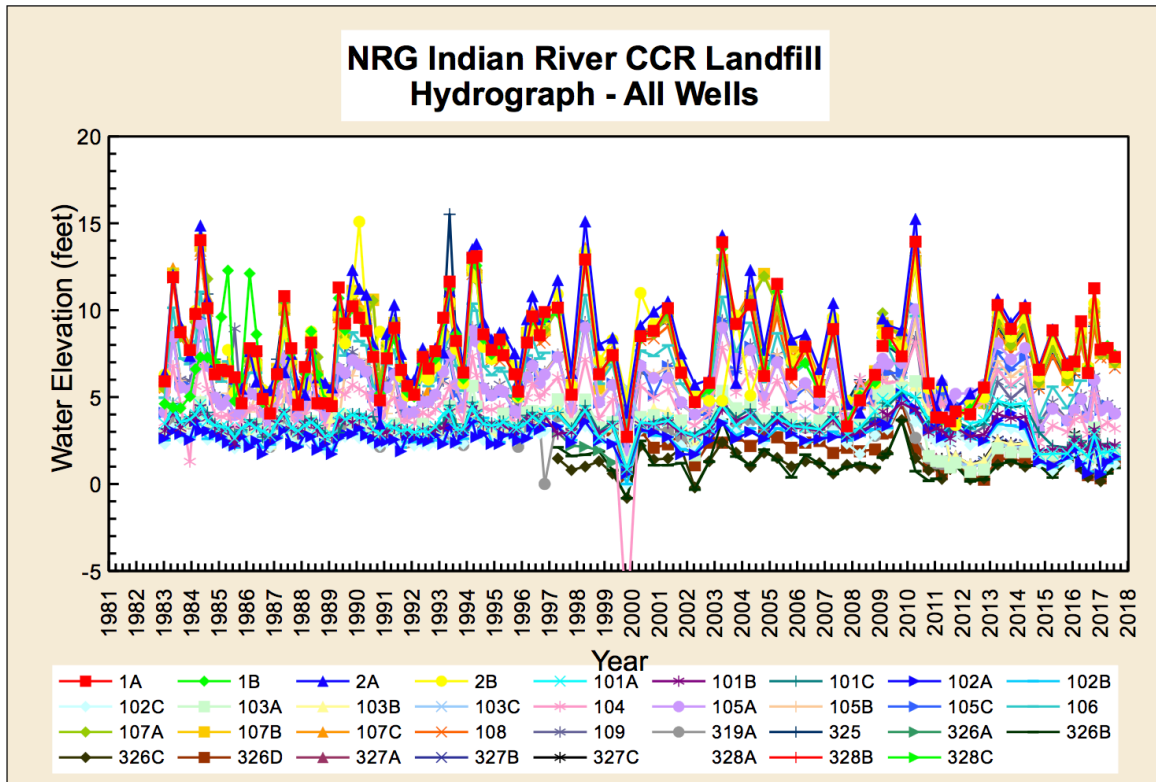
2.2 *Site Hydrogeology*

Hydrologically the landfill is underlain by the shallow unconfined Columbia aquifer which constitutes the uppermost aquifer, extending to a depth of 100 to 110 ft. The silty clay layers at the top of the Miocene sediments may act as a lower confining unit or aquitard.

All of the monitoring wells are set in the Columbia aquifer, which is the uppermost unconfined aquifer at the site. Water level measurements are typically collected from all groundwater monitoring and observation wells during each groundwater monitoring sampling event to collect elevation data for determining groundwater flow directions.

The groundwater monitoring system was developed progressively starting in 1981 and has included up to 35 monitoring points utilizing piezometers, production wells and purpose built monitoring wells. Water levels have been measured in many of these on a quarterly basis for the entire 34-year period of record (Figure 2).

Figure 2: Piezometric Elevations



The record reveals highly variable piezometric elevations (up to about 15 ft) in many of the wells. This general pattern is mimicked by most of the other wells, but on a subdued scale. Factors that might account for this include seasonal variability, tidal effects, storm surge effects and groundwater extraction. Of these, the most likely is groundwater extraction from the multiple industrial supply wells on the site that modify the piezometric surface in response to pumping. The pattern of water usage changes in response to station output: high demand for electricity tending to correlate with increased pumping and corresponding increases in aquifer stress in the vicinity of the supply wells. The location of the supply wells is indicated on Figure 1; they are designated 'A', 'B', 'C', and 'F'. Wells 'G' and 'H' are located between well 'C' and the generating station. Shallow monitoring wells located closest to the supply wells tend to exhibit the greatest variability. It can be readily appreciated that piezometric conditions in the uppermost aquifer are part of a highly dynamic and variable system.

This must be considered when evaluating the groundwater flow regime at the CCR landfill. Flow is typically assessed on the basis of interpolated groundwater surface contours. Flow directions are deemed to run perpendicularly to the contours. Contour maps have been prepared at regular intervals as required by the current State permit.

The selected monitoring event groundwater contour maps shown as Figures 3-7 highlight conditions since 2010 with particular attention to the period of background monitoring required with particular attention to the period of background monitoring required under §257.94.

Figure 3: April 2010. High Observed Flow Gradient Across the Site. Flow Direction Dominantly Northeasterly.

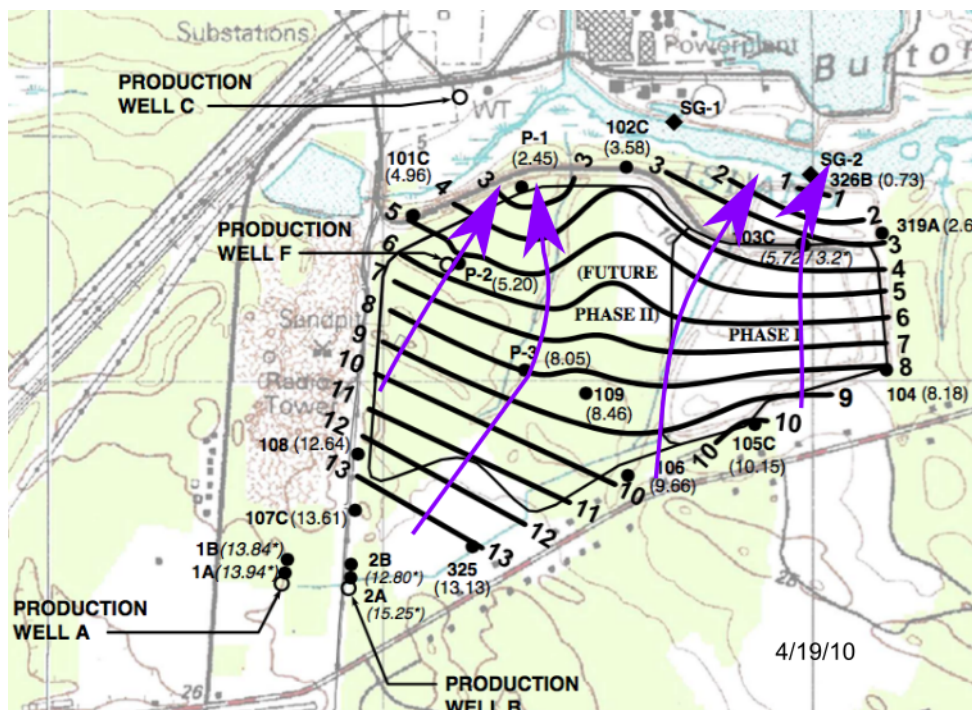


Figure 4: October 2010. Highly Subdued Gradient Compared with Previous Event but Flow Direction still Dominantly Northeasterly with some Northerly Components.

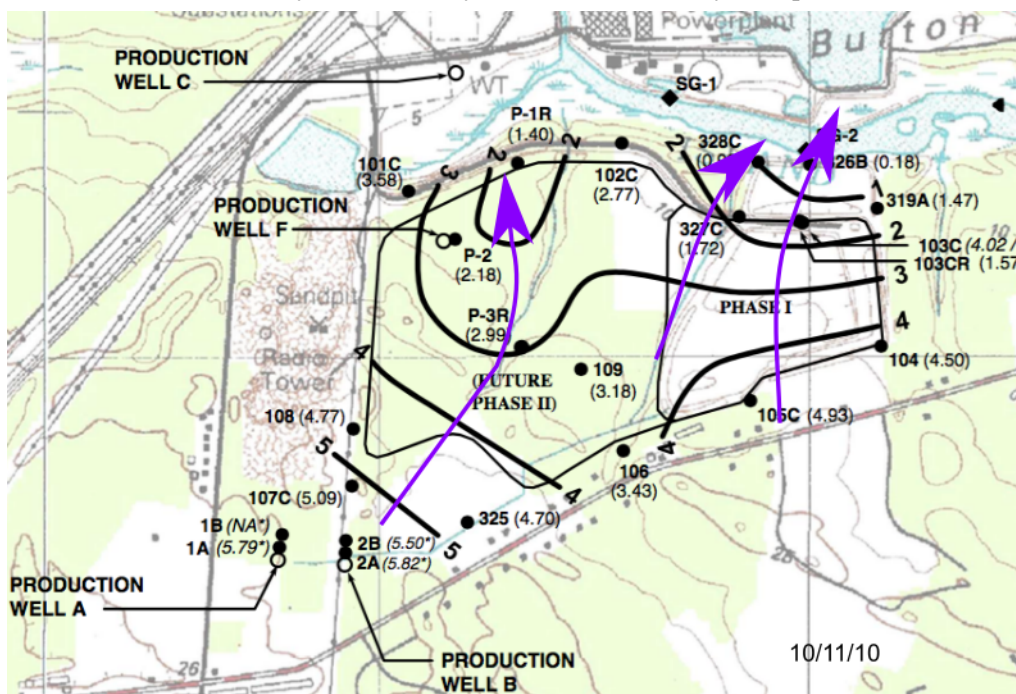


Figure 5: October 2015. Start of Background Monitoring. Moderate Gradient with Flow Consistently Northeasterly.

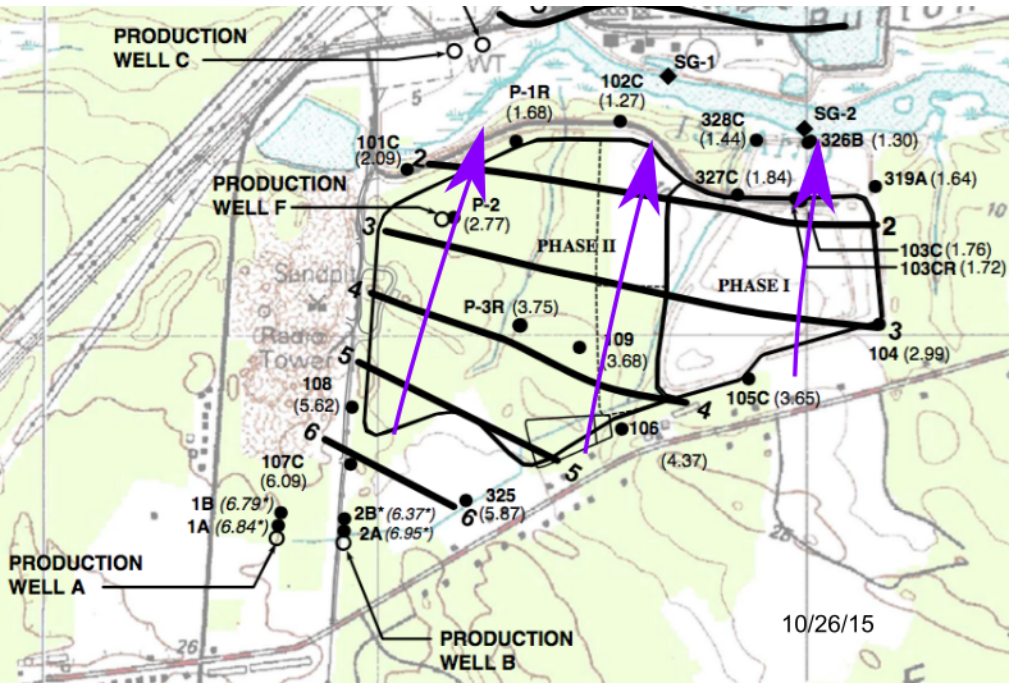
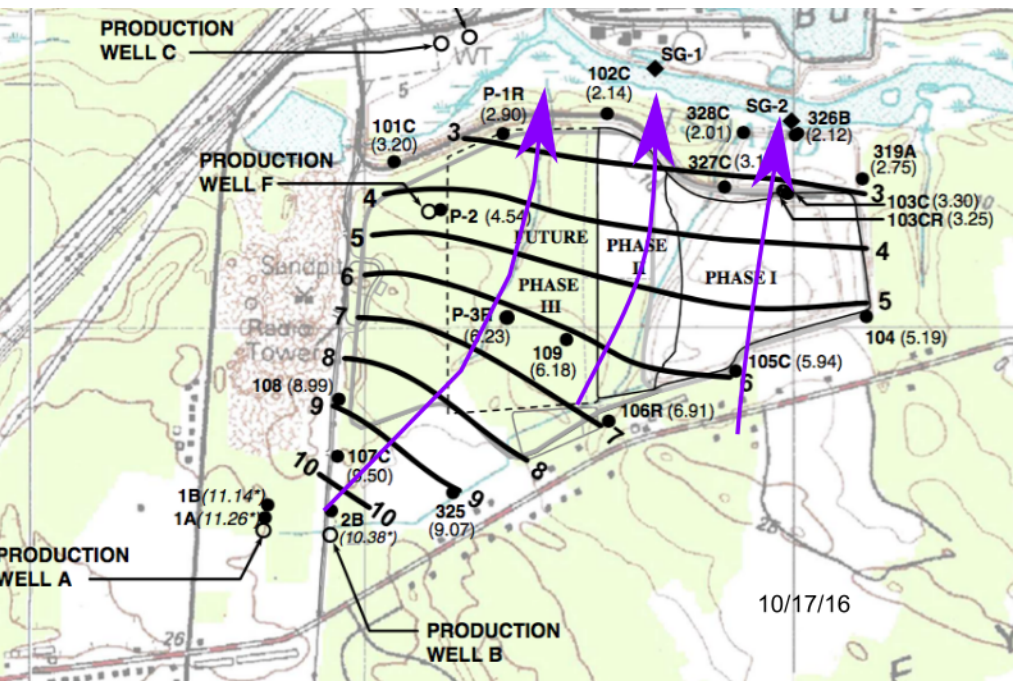


Figure 6: October 2016. Moderate to High Gradient with Northeasterly Flow.



Map of the Radio Tower area showing production wells A, B, C, and F, and various monitoring points. The map includes contour lines, a road, and a river. Three purple arrows point from the wells towards the center of the map. The date 9/11/17 is in the bottom right corner.

PRODUCTION WELL C

PRODUCTION WELL F

PRODUCTION WELL A

PRODUCTION WELL B

Radio Tower

SG-1

SG-2

PHASE I

PHASE II

PHASE III

Future Phase III

101C (2.56)

102C (1.31)

328C (1.23)

326B (1.03)

319A (2.11)

103C (2.35)

103CR (2.27)

104 (4.13)

105C (4.95)

106R (5.77)

325 (7.94)

108 (7.78)

107C (8.35)

1B (9.42')

1A (9.52')

2B (8.87')

P-1R (2.08)

P-2 (3.63)

P-3R (5.05)

109 (5.04)

9/11/17

10

3.0 Detection Groundwater Monitoring System

Groundwater samples can be recovered from a network of 34 monitoring wells, six production wells and three observation wells. The current list of wells is presented in Table 1 in Attachment A. The active State permit requires monitoring at many of these locations.

§257.91 requires that there be a minimum of one background well and three downgradient wells. This requirement can be met with a subset of the existing monitoring system as shown in Table 1 and Figure 8.

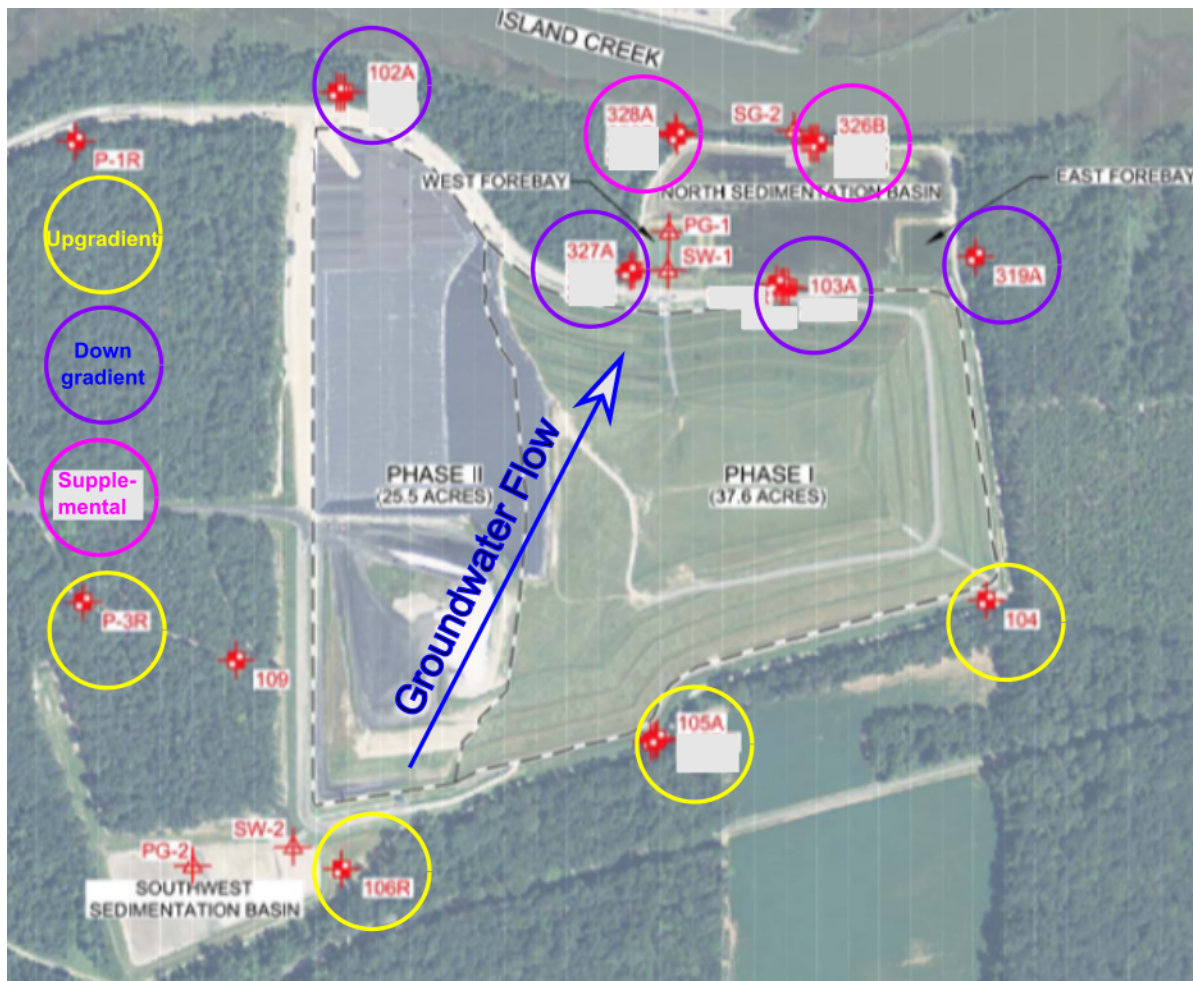
Table 1: Detection Monitoring Wells

Well	Location	Comment
106R	up-gradient	background
105A	up-gradient	background
104	up-gradient	background
P-3R	side gradient	background
102A	down gradient - unit boundary	release detection
327A	down gradient - unit boundary	release detection
103A	down gradient - unit boundary	release detection
319A	down gradient - unit boundary	release detection
328A	down gradient - supplemental	release detection - beyond boundary
326B	down gradient - supplemental	release detection - beyond boundary

Four background wells are identified based solely on hydrogeological considerations. Depending on the statistical methods selected and the results of analysis, it may be necessary to eliminate one or more of those wells while still preserving the regulatory minimum of one.

Four unit boundary downgradient wells are selected for release detection, compliant with the Part 257 mandate for a minimum of three. In addition, two wells located slightly downgradient from the boundary north of the sedimentation pond will be considered.

Figure 8: Detection Groundwater Monitoring System



3.1 Monitoring Well Construction

The groundwater monitoring wells are located both singly and in clusters. They are constructed of two-inch diameter PVC pipe with slotted PVC screen placed at the intervals described in Table 1 – Attachment A. Single monitoring wells are screened near the top of the saturated zone in the aquifer with a 10-foot section of screen. Well clusters consist of three separate wells (example: wells 102A, 102B and 102C) constructed near each other and screened at discrete depths increasing from 10 ft to 45 ft below the water table. Sand was placed in the annulus around the well screen and an impermeable seal of bentonite clay and cement was backfilled in the annulus above. Each well has a protective steel outer casing with lockable lid to prevent tampering. Boring logs and well construction records for all wells in the groundwater monitoring system are provided in Attachment A.

Groundwater well clusters at the site were installed within the Columbia sand deposits, with screened intervals ranging in elevation (NAVD 88) between -29.3 to -49.0 ft for the deep wells, -15.0 to -33.8 ft for the intermediate depth wells, and -2.5 to -18.5 ft for the shallow wells. A summary table of the well depths and screen elevations is provided in Table 1 – Attachment A. Table 2 in Attachment A lists coordinate locations for the wells.

3.2 Groundwater Monitoring Sampling Method and Equipment

To support the collection of representative groundwater samples from the monitoring wells, the low-flow method has been adopted and utilized for sampling at the groundwater monitoring network and will remain in place for subsequent Part 257 groundwater sampling.

The low-flow method is documented and accepted by the USEPA and allows for purging/sampling of groundwater such that laminar flow (non-turbulent) conditions are maintained with corresponding minimal or no drawdown in the well. This, in turn, promotes continuous or near-continuous groundwater recharge of the well from the surrounding formation, and ensures that the subsequently collected samples are representative of fresh formation waters. Low-flow sampling is performed using portable sampling equipment. Portable air-operated bladder pump with disposable tubing is used to perform the groundwater sampling. The portable pump intake is carefully set so that sediment from the bottom of the wells or stagnant water from the top of the water columns is not drawn in during the purging/sampling. Groundwater sampling events includes collection of an equipment-rinsate blank to demonstrate that proper decontamination of the pump has been performed and that contaminants have not been introduced by the sampling method.

4.0 Professional Engineer's Certification

I, Stuart Edwards, hereby certify, based on a review of the information contained herein, field observations of the monitoring well network, and my knowledge and understanding of accepted hydrogeological principles, that the detection groundwater monitoring systems associated with the NRG Indian River Generating Station CCR Landfill is adequate and appropriate. Orientation of the groundwater monitoring system is sufficient to satisfy the performance standards outlined in §257.91(a) (1-2).

Signature:



Date:

October 17, 2017



Stuart Edwards

Delaware Professional Engineer Registration No. 7341

Michael Baker International

5.0 References

- Gilbert Associates, Inc. 1976, 1980. *Design Plan for the Environmentally Safe Disposal of Coal Ash, Indian River Power Generating Station*. Report submitted to the Delaware DNREC by Delmarva Power and Light Company.
- Golder and Associates. March 2008. *Hydrogeologic Assessment for the Indian River Generating Station Phase II Coal Ash Landfill*. Golder Associates Inc. Mt. Laurel, New Jersey
- CB&I Environmental and Infrastructure, Inc., Plan June 2017. *Figure 1. Environmental Monitoring Plan (EMP) for Indian River Landfill*. APTIM, St. Charles, Illinois
- Michael Baker International. March 2016. *NRG Indian River Generating Station Industrial Waste Facility 2016 Annual Report*. Michael Baker International, Moon Township, Pennsylvania.
- USGS, 1985. *National water summary 1984: Hydrologic events, selected water-quality trends, and ground-water resources*. United States Geological Survey, Water Supply Paper 2275, 1985.

Attachment A – Boring Logs and Well Construction Records

Table 1: Groundwater Monitoring Wells

Well	Top of PVC Casing Elevation ¹ (NAVD 88) (feet)	Ground Surface Elevation ¹ (NAVD 88) (feet)	Screen Elevation (NAVD 88) (feet)		Monitoring Zone ³
			Top ²	Bottom ²	
Production and Observation Wells					
A	25.2 ⁴	23.4 ⁴	-66.6 ⁴	-86.6 ⁴	Very Deep (Production Well)
1A	26.2	23.1	-71.7	-76.7	Very Deep (Observation Well)
1B	28.8	25.7	-71.5	-76.5	Very Deep (Observation Well)
B	20.1 ⁴	19.5 ⁴	-90.5 ⁴	-110.5 ⁴	Very Deep (Production Well)
2A	20.7	18.5	-71.5	-81.5	Very Deep (Observation Well), Abandoned 04/05/16
2B	22.9	20.0	-62.4	-72.4	Very Deep (Observation Well)
C	NA	8.2 ⁴	-191.8 ⁴	-251.8 ⁴	Very Deep Miocene Sediments (Production Well)
F	13.3 ⁴	11.8 ⁴	-24.4 ⁴	-67.4 ⁴	Deep (Production Well) (estimated elevations)
G	NA	NA	NA (-192') ⁵	NA (-252') ⁵	Very Deep Miocene Sediments (Production Well)
H	NA	NA	NA (-187') ⁵	NA (-197') ⁵	Very Deep Miocene Sediments (Production Well)
Upgradient and Side Gradient Wells					
104	15.0	13.0	-7.0	-17.0	Shallow
105A	18.2	16.9	-34.5	-44.5	Deep
105B	18.9	17.0	-15.3	-25.3	Intermediate, Abandoned 6/29/16
105BR	18.9	16.6	-13.4	-23.4	Intermediate, Installed 6/30/16
105C	19.4	16.9	-2.3	-12.3	Shallow
106R	16.0	13.7	-6.3	-16.3	Shallow, Installed 6/30/2016
107A	20.7	19.7	-31.2	-41.2	Deep
107B	21.3	19.7	-15.8	-25.8	Intermediate
107C	21.4	19.7	-0.5	-10.5	Shallow
108	24.6	23.2	-2.3	-12.3	Shallow
109	17.3	14.5	-3.3	-13.3	Shallow
325	22.8	22.0	15.4	-1.1	Shallow
P-1R	14.4	10.7	-2.1	-12.1	Shallow well
P-2	13.9	11.5	7.7	-2.3	Very Shallow piezometer
P-3R	15.7	12.7	-4.4	-14.4	Shallow well

Table 1: Groundwater Monitoring Wells (continued)

Well	Top of PVC Casing Elevation1 (NAVD 88) (feet)	Ground Surface Elevation1 (NAVD 88) (feet)	Screen Elevation (NAVD 88) (feet)		Monitoring Zone3
			Top ²	Bottom ²	
Downgradient Wells					
101A	11.2	10.0	-33.6	-43.6	Deep
101B	11.9	10.0	-15.7	-25.7	Intermediate
101C	12.0	10.3	-2.7	-12.7	Shallow
102A	13.8	12.4	-35.3	-45.3	Deep
102B	14.3	12.5	-16.4	-26.4	Intermediate
102C	14.7	12.3	-5.1	-15.1	Shallow
103A	24.4	22.3	-30.6	-40.6	Deep
103B	23.6	21.7	-19.7	-29.7	Intermediate
103C	23.2	21.7	-3.9	-13.9	Shallow
103CR	20.9	17.8	-5.8	-15.8	Shallow
319A	9.1	6.9	-3.5	-13.5	Shallow
326B	11.1	9.4	-3.0	-13.0	Shallow
326C	11.8	9.4	-19.7	-29.7	Intermediate
326D	11.9	9.2	-27.4	-37.4	Deep
327A	15.9	12.8	-35.6	-45.6	Deep
327B	13.4	10.9	-23.8	-33.8	Intermediate
327C	12.8	10.2	-8.5	-18.5	Shallow
328A	10.8	8.8	-38.2	-48.2	Deep
328B	12.1	9.4	-20.0	-30.0	Intermediate
328C	12.5	10.2	-5.3	-15.3	Shallow

Notes: NA = Information not available for inclusion in report.

¹Elevations based on 2015 and 2016 Survey. Elevations from the 2016 survey include wells 105BR, 106R, 2B, and 109 that are shown in italics.

²Bottom of well screen assumed to be at bottom of well based on field observations/measurements post 2015/2016 outer protective steel casing replacements. The elevation of the top of the well screen estimated from bottom of well elevation and length of well screen on boring logs. Screen elevations shown in italics have been revised based on measurements taken immediately after April 2016 well development.

³ The zones monitored by the well screen are installed in the Pleistocene Columbia deposits unless noted otherwise as being in the very deep Miocene sediments. The monitoring zone column describes the well screen position (very shallow, shallow, intermediate, deep or very deep) relative to the location of the other well screens within the clusters.

⁴Elevations for Production Wells A, B, C, and F are provided for comparison purposes only as they are based on the erroneous 2010 survey which may differed from 2015 survey by as much as three feet.

⁵Elevations are not available for production wells G, and H, and wells 326A, so depths of well screen from ground surface are shown in parentheses for relative comparisons.

Table 2: Well Locations

Well ID	Easting NAD83 (feet)	Northing NAD83 (feet)
Prod. Well A	705642.953	209037.060
Prod. Well B	706142.961	208996.202
Prod. Well C	706926.347	212810.967
Prod. Well F	706909.894	211502.517
Prod. Well G	#N/A	#N/A
Prod. Well H	#N/A	#N/A
1A	705654.330	209131.461
1B	705667.454	209230.543
2A	706149.497	209090.921
2B	706155.361	209190.259
101A	706648.862	211882.885
101B	706637.978	211877.451
101C	706628.574	211875.364
102A	708275.362	212242.133
102B	708264.512	212241.292
102C	708253.234	212242.731
103A	709630.813	211645.513
103B	709618.546	211647.772
103C	709608.631	211647.253
103CR	709594.078	211656.075
104	710234.982	210689.763
105A	709212.020	210257.751
105BR	709,225.553	210,257.516
105C	709230.794	210267.676
106R	708267.073	209868.757
107A	706190.059	209589.995
107B	706188.923	209601.084
107C	706187.815	209611.923
108	706208.027	210040.75
109	707945.254	210506.808
319A	710201.904	211739.894
325	707081.014	209329.118

Table 2: Well Locations (continued)

Well ID	Easting NAD83 (feet)	Northing NAD83 (feet)
326A	#N/A	#N/A
326B	709697.292	212086.202
326C	709708.835	212086.115
326D	709720.261	212086.081
327A	709158.941	211697.613
327B	709149.938	211695.368
327C	709144.259	211693.533
328A	709285.804	212121.045
328B	709288.328	212114.813
328C	709290.616	212108.119
P-1R	707455.468	212093.161
P-2	706973.827	211506.723
P-3R	707478.115	210685.095

Upgradient Wells

Well 104

Project Delmarva Power and Light Company
Indian River Power Plant
 Boring No. 104 Ground Elev. _____
 Station _____ Offset _____
 Date Started _____ Date Completed _____
 Remarks _____

Michael Baker, Jr., Inc.
 Test Boring Record

SHEET 1 OF 1

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)
						10	20	30	40	50	
		s	1	SAND, f-med gr, ltl silt, tr gravel, brn, med dns, damp, qtz							
	5	s	2								
	10	s	3	(Wet below a depth of 11 feet)							
	15	s	4								
-2.3		s	5	SAND, f-crs gr, ltl silt, lt brn, med dns, wet, qtz							
-6.3	20	s	6	SAND, f gr, ltl silt, lt brn, lse, wet, qtz							
-10.3	25	s	7	SAND, f-crs gr, ltl silt, lt brn, med dns, wet, qtz	SP- SM						20.5
-15.3	30	s	8	SAND, med-crs gr and GRAVEL, ltl silt, lt brn, med dns, wet, qtz							
-17.3				END OF BORING @ 30.0'							
	35			DEPTH SCREENED: 20.0'-30.0'							

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 104

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:
Water Supply Section
Division of Environmental Control
attn: Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

APPLICATION FOR A PERMIT TO DRILL A WELL

To be completed by a licensed water well driller)

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILLING
IS STARTED.

Owner: Delaware Power Light Co.
Telephone Number: 40 Walton Cor.
Mailing Address: PO Box 1097
110 Newart Del. 19711
County: _____ Zip: _____

Date of Application: 10 Mon. 10 Day 81 Year
Estimated Date of Construction: 10/15/81
Driller: WALTON CORP License No. 52
Pump Installer: _____ License No. _____

WELL INFORMATION (circle one)

Purpose: Test Well - Permanent Well - Option to convert

Use: Domestic - Public - Commercial

Industrial - Agriculture - Other

Describe Other: MonitorIs this a replacement well? yes no

Reason for replacement: _____

Date abandoned well is to be sealed: _____

How _____

Has an application been made for an approved sewage disposal system? yes - no

Permit Number: N/A

LOCATION MAPS

Enclosed: From

Michael Baker Jr. Inc

4301 Dutch Ridge Rd

Box 280

Beaver, Pa. 15009

Road Map

PROPOSED WELL CONSTRUCTION

Method of drilling: AugerApproximate total depth of well: 25 ft.Name of aquifer: COLUMBIA SANDCasing diameter (s)
inner to outer (in.) 2 I DCasing Material: PVCScreen Material: PVCTentative Screen Setting: between 15 and 25 ft.Estimated length of screen: 10 ft.Will the well be gravel packed? yes - noType of grout: separate From: 15 ft. to 0 ft.Desired capacity of the well: 2 gpmMaximum daily use: NONE gpd

I hereby affirm the information I have furnished
is accurate and correct

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. -- Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed: (

his permit expires: 10/14/82SIGNED: John A. Hamilton

A completion report must be filed with the Division of Environmental Control within twenty-one (21) days after completion of this well. Failure to do so may result in license suspension.

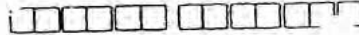
Permit Number: 49753
Report filed _____

Well 104

PLEASE RETURN TO:

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 40-06/78/01/



WELL COMPLETION REPORT

1. Permit Number: <u>49752</u> Owner of well: <u>DPL L. Indian River #104</u>	11. Gravel pack: Type <u>#1 Gravel</u> From <u>20</u> to <u>30</u> feet
2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u>	12. Static Water Level: Date _____ Ft. (Below, Above) Ground Surface _____
3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Auger</u>	13. Pumping Water Level: _____ Ft. below grade after _____ hours at _____ gpm
4. Test Well ☐ Observation ☒ Production ☐	14. Well Head Completion: Type: Pitless Adapter ☐ Other _____ inches above grade _____
5. Total Well Depth: <u>30'</u> feet Date Completed <u>10/21/81</u> Month Day Year	15. Type of Permanent Pump Installed: Pump Manuf. _____ Rated capacity _____ Pump intake setting _____ Ft. below grade
6. If this is a replacement well, how was previous well abandoned? <u>N/A</u>	16. The completed well is a. at least 5' from any overhang... ☐ b. at least 50' from any septic tank... ☐ c. at least 10' from town sewer line... ☐ d. at least 100' from the nearest edge of any tilefield... ☐ (if well is cased less than 50') e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth... ☐
7. Casing Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> in. From <u>0</u> to <u>30</u> feet	17. The nearest neighbors (circle one) <u>septic tank</u> tile field, cesspool, or privy is <u>400'</u> from completed well.
8. Screen Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> inches Setting from <u>20</u> to <u>30</u> feet	18. Is completed well located as shown on application form? ☐ If no, describe location change.....
9. Grout Type: Cement ☒ Bentonite Clay ☐ Other _____ From <u>0</u> to <u>3'</u> feet	
10. Non-grout Backfill of Well Annulus Type <u>Natural Material</u> From <u>0</u> to <u>20</u> feet	Company Name _____ Signature of Water Well Contractor _____ Date _____

Well 105A

Project Delmarva Power and Light Company
Indian River Power PlantBoring No. 105A Ground Elev. 15.6Station See Plan Offset Date Started Date Completed Remarks Michael Baker, Jr., Inc.
Test Boring RecordSHEET 1 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)	
						10	20	30	40	50		
		s	1	SAND, f-med gr, tr silt, brn, med dns, moist, qtz								
	5	s	2									
7.6		s	3	SAND, med-crs gr, tr silt, lt brn, med dns, moist, qtz	SP- SM						11.6	
4.6		s	4	SAND, med-crs gr, tr gravel, lt brn, loose, wet, qtz								
0.6	15											
		s	5	SAND, med-crs gr, ltl gravel, tr silt, gry, lse, med dns, wet, qtz								
	20											
		s	6									
	25	s	7									
-11.4		s	8	SAND, f-crs gr, ltl gravel, tr silt, gry, med dns, wet, qtz								
-15.4		s	9	SAND, f-med gr, ltl silt, gry, lse, wet, qtz								
-19.4	35											
		s	10	SAND, med-crs gr, tr silt, tr gravel, gry, med dns, wet qtz								
-23.4	40											

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 105A

Project Delmarva Power and Light Company
Indian River Power PlantBoring No. 105A Ground Elev. _____

Station _____ Offset _____

Started _____ Date Completed _____

Remarks _____

Michael Baker, Jr., Inc.
Test Boring RecordSHEET 2 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)
						10	20	30	40	50	
		s	11	SAND, f-crs gr ^{some} and GRAVEL, tr silt, gry, dns, wet, qtz							
	45	s	12								
-31.4											
	50	s	13	SAND, f-med gr, tr silt, tr gravel, gry, dns, wet, qtz							
-35.4											
	55	s	14	SAND, f-crs gr and GRAVEL, tr silt, gry, v dns, wet, qtz	SW- SM						16.2
	55										
		s	15								
-42.4											
	60			END OF BORING @ 58.0'							
				DEPTH SCREENED: 48.0'-58.0'							

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 105A

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:
Water Supply Section
Division of Environmental Control
Tatnall Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
APPLICATION FOR A PERMIT TO DRILL A WELL
(To be completed by a licensed water well driller)

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILLING
IS STARTED.

Owner: Indian River Power Station
Telephone Number: Capitol Hill Corp.
Mailing Address: P.O. Box 1097
1101 West 11th St. Del 19711
County _____ Zip _____

Date of Application: 10/12 Mon. 2 Day 31 Year
Estimated Date of Construction: 10/15/81
Driller: Capitol Hill Corp. License No. 52
Pump Installer: _____ License No. _____

WELL INFORMATION (circle one)

Purpose: Test Well Permanent Well - Option to convert
Use: Domestic - Public - Commercial
Industrial - Agriculture - Other
Describe Other: Monitor

Is this a replacement well? yes (no)
Reason for replacement: _____

Date abandoned well is to be sealed: _____

How _____

Has an application been made for an approved sewage
disposal system? yes - no

Permit Number: U/A

LOCATION MAPS

Enclosed: From

Michael Baker Jr. Inc.

4301 Dutch Ridge Rd

Box 380

Road Map Beaver, Pa. 15009

PROPOSED WELL CONSTRUCTION

Method of drilling: Auger

Approximate total depth of well: 25 ft.

Name of aquifer: Quartz Sand

Casing diameter (s) 2 I D

inner to outer (in.)

Casing Material: P.V.C.

Screen Material: P.V.C.

Tentative Screen Setting: between 15 and 25 ft.

Estimated length of screen: 10 ft.

Will the well be gravel packed? yes no

Type of grout: grout From: 15 ft. to 17 ft.

Desired capacity of the well: 25 gpm

Maximum daily use: Done gpd

I hereby affirm the information I have furnished
is accurate and correct.

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. -- Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed: (

This permit expires: 10/14/82

SIGNED: Lee A. Hamilton

A completion report must be filed with the Division of Environmental
Control within twenty-one (21) days after completion of this well.
Failure to do so may result in license suspension.

Permit Number: 49753
Report filed _____

DOCUMENT 40-08/78/01/3

PLEASE RETURN TO:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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WELL COMPLETION REPORT

1. Permit Number: <u>49753</u> Owner of well: <u>DP + L Indian River # 105-A</u> 2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u> 3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Auger</u> 4. Test Well ☐ Observation ☒ Production ☐ 5. Total Well Depth: <u>58'</u> feet Date Completed <u>10/22/81</u> Month Day Year 5. If this is a replacement well, how was previous well abandoned? <u>N/A</u> 7. Casing Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> in. From <u>0</u> to <u>48'</u> feet Screen Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> inches Setting from <u>48'</u> to <u>58'</u> feet Grout Type: Cement ☒ Bentonite Clay ☐ Other _____ <u>0</u> to <u>3</u> feet 8. Non-grout Backfill of Well Annulus Type <u>Natural materials</u> From <u>0</u> to <u>48'</u> feet	11. Gravel pack: Type <u>#1 Gravel</u> From <u>48'</u> to <u>58'</u> feet 12. Static Water Level: Date _____ <u>12</u> Ft. (Below, Above) Ground Surface 13. Pumping Water Level: <u>N/A</u> Ft. below grade after _____ hours at _____ gpm 14. Well Head Completion: Type: Pitless Adapter ☐ Other <u>1.5' PVC</u> <u>Stick-up</u> inches above grade 15. Type of Permanent Pump Installed: Pump Manuf. <u>N/A</u> Rated capacity _____ Pump intake setting _____ Ft. below grade 16. The completed well is <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> a. at least 5' from any overhang b. at least 50' from any septic tank c. at least 10' from town sewer line d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50') e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth </td> <td style="width: 50%; text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Main</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">N</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">O</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> </table> </td> </tr> </table> 17. The nearest neighbors (circle one) <u>septic tank</u> <u>tile field</u> <u>cesspool</u>, or <u>privy</u> is <u>~150'</u> from completed well. 18. Is completed well located as shown on application form? ☒ If no, describe location change..... Company Name _____ Signature of Water Well Contractor _____ Date _____	a. at least 5' from any overhang b. at least 50' from any septic tank c. at least 10' from town sewer line d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50') e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth	<table border="1" style="margin: auto;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Main</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">N</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">O</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> </table>	Main	N	O	☒	☒	☒	☒	☒	☒	☒	☒	☒
a. at least 5' from any overhang b. at least 50' from any septic tank c. at least 10' from town sewer line d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50') e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth	<table border="1" style="margin: auto;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">Main</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">N</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">O</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> <tr> <td>☒</td> <td>☒</td> <td>☒</td> </tr> </table>	Main	N	O	☒	☒	☒	☒	☒	☒	☒	☒	☒		
Main	N	O													
☒	☒	☒													
☒	☒	☒													
☒	☒	☒													

Well 106

Abandoned 6/28/2016

Project: Delmarva Power and Light Company
Indian River Power Plant

Boring No. 106 Ground Elev. 14.1

Station See Plan Offset

Started Date Completed

Remarks

Michael Baker, Jr., Inc.
Test Boring Record

SHEET 1 OF 1

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)	
						10	20	30	40	50		
		s	1	SAND, f-med gr, ltl silt, tr org, brn, v lse - med dns, moist, qtz								
7.1	5	s	2		SP- SM						5.2	
	10	s	3	SAND, f-crs gr, tr gravel, brn and gry, lse, moist, qtz								
3.1	15	s	4	SAND, f-crs gr, ltl silt, tr gravel, gry, lse, wet, qtz								
-0.9		s	5	SAND, f-med gr, some silt, tr gravel, gry, med dns, wet, qtz								
-4.9	20	s	6	SAND, f-crs gr, some silt, tr gravel, gry, med dns, wet, qtz	SW- SM						20.8	
	25	s	7									
-15.9	30	s	8									
				END OF BORING @ 30.0'								
				DEPTH SCREENED: 20.0'-30.0'								

DRILLING CO. Walton Corporation

INSPECTOR C. J. Coe

Well 106

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:

Abandoned 6/28/2016

Water Supply Section
Division of Environmental Control
Tatnall Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

APPLICATION FOR A PERMIT TO DRILL A WELL IS STARTED.

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILL

To be completed by a licensed water well driller)

Owner: Michael R. Raker Jr.
Telephone Number: 302-241-1471
Mailing Address: P.O. Box 1494
Attn: Manager, DE, 19711
County Delaware Zip 19711

Date of Application: Mon. 6/28/16 Day 28 Year 2016
Estimated Date of Construction: 6/28/16
Driller: Michael Raker Jr. Inc. License No. 52
Pump Installer: — License No. —

WELL INFORMATION (circle one)

Purpose: Test Well; Permanent Well - Option to convert

Use: Domestic - Public - Commercial

Industrial - Agriculture - Other

Describe Other: Monitor

Is this a replacement well? yes (no)

Reason for replacement: —

Date abandoned well is to be sealed: —

How —

Has an application been made for an approved sewage disposal system? yes - no

Permit Number: 111A

LOCATION MAPS

Enclosed 1 From
Michael Raker Jr. Inc.
4301 Dutton Ridge Rd.
Box 280
Beaver, PA 15209

Road Map

PROPOSED WELL CONSTRUCTION

Method of drilling: Auger

Approximate total depth of well: 25 ft.

Name of aquifer: unconsolidated sand

Casing diameter (s)
inner to outer (in.) 2 1/2

Casing Material: PVC

Screen Material: PVC

Tentative Screen Setting: between 15 and 25 ft.

Estimated length of screen: 10 ft.

Will the well be gravel packed? yes - no

Type of grout: grout From: 15 ft. to 0 ft.

Desired capacity of the well: 25 gpm

Maximum daily use: 25 gpd

I hereby affirm the information I have furnished is accurate and correct

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. -- Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed: 10/14/22

This permit expires: 10/14/22

SIGNED: Lee A. Raker Jr.

A completion report must be filed with the Division of Environmental Control within twenty-one (21) days after completion of this well. Failure to do so may result in license suspension.

Permit Number: 49756
Report filed —

Well 106

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 40-08/78/01/

PLEASE RETURN TO:

Abandoned 6/28/2016

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WELL COMPLETION REPORT

1. Permit Number: <u>49756</u> Owner of well: <u>DPL Indian River #106</u>	11. Gravel pack: Type <u>#1 Gravel</u> From <u>20</u> to <u>30</u> feet															
2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u>	12. Static Water Level: Date <u>10/22/81</u> <u>13</u> Ft. (Below, Above) Ground Surface															
3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Auger</u>	13. Pumping Water Level: <u>N/A</u> Ft. below grade after _____ hours at _____ gpm															
4. Test Well ☐ Observation ☒ Production ☐	14. Well Head Completion: Type: Pitless Adapter ☐ Other <u>1.5" PVC</u> <u>Stick-up</u> inches above grade															
5. Total Well Depth: <u>30'</u> feet Date Completed <u>10/22/81</u> Month Day Year	15. Type of Permanent Pump Installed: Pump Manuf. <u>N/A</u> Rated capacity _____ Pump intake setting _____ Ft. below grade															
6. If this is a replacement well, how was previous well abandoned? <u>N/A</u>	16. The completed well is <table border="0"> <tr> <td>a. at least 5' from any overhang.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>b. at least 50' from any septic tank.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>c. at least 10' from town sewer line.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50').....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....</td> <td>☒</td> <td>☐</td> </tr> </table>	a. at least 5' from any overhang.....	☒	☐	b. at least 50' from any septic tank.....	☒	☐	c. at least 10' from town sewer line.....	☒	☐	d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50').....	☒	☐	e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....	☒	☐
a. at least 5' from any overhang.....	☒	☐														
b. at least 50' from any septic tank.....	☒	☐														
c. at least 10' from town sewer line.....	☒	☐														
d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50').....	☒	☐														
e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....	☒	☐														
7. Casing Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2</u> in. From <u>0</u> to <u>20</u> feet	17. The nearest neighbors (circle one) <u>septic tank</u> , <u>tile field</u> , <u>cesspool</u> , or <u>privy</u> is <u>~300'</u> from completed well.															
8. Screen Material: Steel ☐ PVC ☐ Concrete ☐ Diameter <u>2</u> inches Setting from <u>20</u> to <u>30</u> feet	18. Is completed well located as shown on application form? ☒ If no, describe location change.....															
9. Grout Type: Cement ☒ Bentonite Clay ☐ Other _____ From <u>0</u> to <u>3'</u> feet																
10. Non-grout Backfill of Well Annulus Type <u>Natural Materials</u> From <u>0</u> to _____ feet	Company Name _____ Signature of Water Well Contractor _____ Date _____															

Well 106

abandoned 6/28/2016

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
#9 KINGS HIGHWAY
DOVER, DELAWARE 19901PHONE 302-739-9944
FAX 302-739-7764STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROLWELL or SOIL BORING
ABANDONMENT REPORT<http://www.dnrec.state.de.us/>WELL ABANDONMENT REPORT MUST BE
RETURNED WITHIN 30 DAYS OF
ABANDONMENT

- OFFICIAL USE ONLY -

PAGE _____ OF _____ PAGES

PERMIT #:

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE TYPE OR PRINT - USE BLUE OR BLACK INK ONLY

Permit # of Abandoned Well: 49750

Replacement Well Permit #: 154860

Local ID: 106 Tax Map/Parcel #:

Property Owner: NRG INDIAN RIVER, LLC

Well Contractor: A.C. SCHULTZ OF DE Lic #: 14

Well Driller in Charge: LARRY HOWSEY Lic #: 5324

Construction Date of Abandoned Well/Soil Boring: N/A

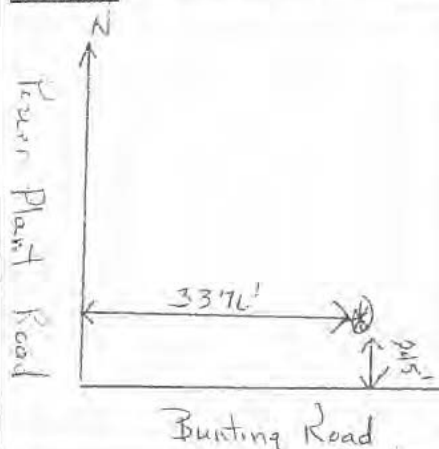
Abandonment Date: 6/28/2016

WELL CONSTRUCTION METHOD (if known):

- | | | |
|---|----------------------------------|-------------------------------------|
| ☒ Augered | ☐ Bored | ☐ Cable Tool |
| ☐ Driven | ☐ Jetted | ☐ Air Rotary |
| ☐ Mud Rotary | ☐ Reverse | ☐ Washed |

☐ Other (Specify):

PROVIDE A LOCATION SKETCH OF ABANDONED WELL(S)

Draw a sketch below showing location of well in relation to at least two county
or state roads. Give distance from site to nearest road junction and SHOW A
NORTH ARROW.

WELL ABANDONMENT:

Casing Material: PVC

Casing Diameter (inches): 4"

Well Depth: 25'

Was any Casing Removed? ☐ NO ☒ YES

If YES, Amount of Casing Removed (feet): 7'

Was Casing Ripped or Perforated? ☐ NO ☒ YES

Type of Sealing Material Used: Bentonite Clay

Sealed From: 0 ft To: 25' ft

NOTE: If this form is submitted in place of a completion report for
wells or soil borings installed and abandoned on the same date, a
formation log must be attached. Formation logs must be submitted
on forms provided by DNREC.The abandonment of this well(s) or soil boring(s) is in compliance with
all permit conditions and with all applicable well construction
regulations.☒ YES ☐ NO

COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED
IS ACCURATE AND CORRECT.

Signature - Licensed Driller in Charge of Abandonment

5324

Well Driller License #

6/28/2016

Date

- FOR OFFICIAL USE ONLY - DO NOT WRITE BELOW THIS LINE -

Received By: _____ Modified Grid: _____ DRBC: ☐ YES ☐ NO X-Coord: _____

Amount: _____ Drainage Basin: _____ H2O Utility: _____ Y-Coord: _____

Date: _____ Quad: _____ Flood Zone/Coastal: _____ DOT #: _____

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/8702/03

Well 106R

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE 302-739-9944
FAX 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE
DRILLING IS STARTED.

APPLICATION FOR A PERMIT TO CONSTRUCT
MONITOR, OBSERVATION, RECOVERY WELL(S)

- OFFICIAL USE ONLY -

or SOIL BORING(S)

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

4415724

PAGE 4 OF 4 PAGES

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Property Owner: MRC INDIAN RIVER, LLC
Address: 1146 POWER PLANT ROAD
City: DALSBORO State: DE Zip: 19939
Telephone Number: 302-943-3602
Licensed Preparer/WC: ACSD Lic #: 14
Consulting Firm/Supervising Geologist (if applicable): MICHAEL BAKER
INTERNATIONAL/BRIAN DAVIS
Telephone Number: 412-974-1745
Proposed Construction Date: 6/10/16

DNREC / Other Program
☐ Hazardous Waste ☐ CERCLA
☒ Solid Waste ☐ UST
☐ Land Treatment (Non-Hazardous) ☐ On-Site Septic
☐ Other (Specify) ☐ Wetlands

Site Name/State Permit # (if applicable): MRC INDIAN RIVER
INDUSTRIAL LANDFILL/PERMIT SW-11/01

Name of DNREC Contact Person (if any): ALISON KILLISZEK

Is this a Replacement Well? ☒ YES ☐ NO
Replacement Reason: WELL SCREEN FILLED W/FOAM/A-
TION SANDS
PROPOSED WELL CONSTRUCTION

Proposed Drilling Method: AUGER
Approximate Total Depth: 30'
Approximate Depth to Water Table: 7'

Type of Well(s):
☒ Monitor ☐ Observation ☐ Soil-Boring ☐ OR
☐ Recovery - Maximum Capacity: _____ GPM

Inner Casing	Outer Casing
Casing Top: <u>+2</u>	
Casing Bottom: <u>20'</u>	
Casing Diameter: <u>2"</u>	
Casing Material: <u>PVC</u>	
Proposed Screen Setting: Top: <u>20'</u> TO Bottom: <u>30'</u>	
Proposed Screen Length: <u>10'</u> Material: <u>PVC</u>	
Type of Grout: <u>CLAY</u>	
Grouted From - Top: <u>0</u> TO Bottom: <u>16'</u>	
Benonite/Clay Plug: - Top: <u>16'</u> TO Bottom: <u>17'</u>	
Gravel Pack Interval - Top: <u>17'</u> TO Bottom: <u>30'</u>	
Type of Casing Coupling (threaded, flared, etc.): <u>THREADED</u>	
Screened In (Aquifer Formation): <u>COLUMBIA</u>	

LOCATION MAP - ROAD MAP
County: ☐ New Castle ☐ Kent ☒ Sussex
ADC Map Grid: _____
Nearest Town: AGSPORD
Address of Project Site: 1146 POWER PLANT RD
Tax Map/Parcel #: 33-6,00-105,01

DIRECTION OF WELL FROM TOWN (CIRCLE DIRECTION)

ATTACH ONE COPY OF AN (8.5" x 11" site map (scale at least 1" = 200') with proposed well/boring locations with unit field or area to be monitored clearly indicated. INCLUDE A NORTH ARROW, local landmarks, buildings, existing wells, proposed local ID numbers, and a location map showing a minimum of two county or state roads. Include property size and distance from well(s) to property lines.

Purpose of proposed project and monitored analytes (i.e. Hydrocarbons, priority pollutants, RCRA Appendix IX, etc.): _____

Expected Frequency of Sampling/Reading: QUARTERLY

PLEASE NOTE: Up to 10 wells may be applied for on a single form if located on the same tax map parcel and construction details are identical.

LIST LOCAL ID #S BELOW FOR EACH WELL

LOCAL ID #	PERMIT #
1. <u>106 R</u>	<u>4-116</u>
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Will the operation of this well by itself or in combination with any other well(s), owned or operated by the Permit Holder, withdraw greater than 50,000 gallons in any 24 hr. period? ☒ NO ☐ YES

COMMENTS: _____

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.

Signature: [Signature] Date: 6/2/16
Signature: [Signature] Date: 6/2/16
Signature: [Signature] Date: _____

Please release the contractor's copy of the permit and the well tag to the water well contractor noted on this application: ☒ YES ☐ NO

- FOR OFFICIAL USE ONLY - DO NOT WRITE BELOW THIS LINE -

Received By: JUN 06 2016 Modified Grid: 102-176 DRBC: ☐ YES ☒ NO X-Coord: 65873.72
Amount: _____ Drainage Basin: 33-6,00-105,01 H₂O Utility: _____ Y-Coord: 58954.91
Date: _____ Quad: 33-6,00-105,01 Flood Zone/Coastal: 2 DOT #: _____

WATER SUPPLY
Canary - Work Pink - Owner

Doc No. 40-08/95/01.01

PERMIT #S:



**PERMIT
254860**



Well 106R

Tax Map Number: 2-33-06.00-0105.01

DRILLER COPY

Pursuant to provisions of Title 7, Delaware Code, Chapter 60, permission is hereby granted to:

**NRG Indian River LLC
2146 Power Plant Road, Dagsboro, DE 19939 US**

to construct, operate and maintain 1 Standard Monitor Well(s) in a total of 1 boring(s)

This permit is only valid for construction upon obtaining an Authorization Number from Delaware DNREC.

Construction must be completed on or before 6/14/2017, one year from permit issuance date.

A permit extension can be obtained on or before the date above by contacting Delaware DNREC.

Construction must be done by a person duly licensed by the Delaware DNREC for such activity.

All current regulations governing well construction shall be followed.

All attached permit conditions shall be complied with.

The applicant is responsible for obtaining all additionally required permits and approvals.

Should the well identification tag become detached and irrecoverable from the well(s), the property owner is responsible to contact the Water Supply section of DNREC at 302-739-9944 for a replacement.

6/14/2016

AUTHORIZED SIGNATURE

DATE

Authorization Number:

To obtain authorization please call toll free: 1-866-276-2353



**PERMIT
254860**



Well 106R

Well Driller Responsible Conditions

- §16 The well(s) shall be adequately developed.
- §18 The driller is responsible for decontaminating drilling equipment to prevent cross-contamination.
- §24 The identification tag, supplied by the Department, shall be properly attached to the upper terminus.
- §63 A well completion report shall be submitted to the Water Supply Section within 30 days of completion of well construction.
- §87 The well driller or well driver is required to have at the drilling site an approved authorization number that must accompany the approved well permit.
- §89 No well shall be placed on highway travel lanes, on auxiliary travel lanes, or on roadway shoulders.
- §104 The well driller or well driver is required to have at the drilling site a copy of the signed well permit or, in the case of verbal permits, the permit number.
- §105 The top of the gravel pack shall extend at least 1 foot above the top of the well screen. If the well is influenced by the water table, a minimum of 2 feet of a dry, granular or pelleted bentonite plug placed above the gravel pack is recommended. An approved cement and bentonite mix shall be used to grout either the top of the gravel pack or from the top of the bentonite plug to the ground surface.

Owner/Well Driller Combined Responsibility Conditions

- §1 The approval of this permit does not relieve the responsible party from the requirement for obtaining all permits that are required by federal, state, county, and local governments. The responsible party shall comply with any and all federal, state, county, and local statutes, ordinances, zoning procedures, orders, regulations, rules.
- §2 The issuance of this permit does not guarantee the performance of the permitted well to the standards required by the project. The Department has no knowledge of subsurface conditions or of the constructability of the proposed well.
- §3 This permit is valid only for the specific operations and processes applied for and indicated on the application form and attached drawings. Any unauthorized deviations from the approved project or violations of permit conditions may constitute grounds for revocation. Upon revocation, the well will be ordered abandoned.

"Working for You to Provide Clean Water for Today and Tomorrow"



**PERMIT
254860**



Well 106R

Owner/Well Driller Combined Responsibility Conditions

- §12 The well casing shall be finished and maintained at least 12 inches above grade.
- §22 The existing well(s) shall be abandoned by a licensed well driller or can only be reclassified to observation use in accordance with the Regulations Governing the Construction and Use of Wells.
- §52 If identifiable contamination is detected during construction, and the contamination was not anticipated or evaluated during the permit application and approval process, the well driller shall cease work and notify the Emergency Response Hotline immediately by calling 1-800-662-8802, followed by the Water Supply Section 302-739-9944.
- §54 Representatives of DNREC, the Delaware Geological Survey or the U.S. Geological Survey may inspect the well and/or conduct tests such as but not limited to geophysical logging and sampling, at any reasonable time after serving advance notice.
- §72 The well(s) shall not be chlorinated.

Well 106R

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURE RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT
MUST BE RETURNED WITHIN 30
DAYS OF CONSTRUCTION. A
WELL FORMATION LOG MUST BE
INCLUDED WITH THIS REPORT.

WELL COMPLETION REPORT

-Authorization Number-

4915724

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 254860 Local ID: MW#106
Tax Map/Parcel #: 2-32-06, 00-0163, 01
Property Owner: NRG Indian River LLC
Water Well Contractor: ACSD WC Lic #: 14
Well Driller In Charge During Construction: L. Horsay

DRILLING / EXCAVATION METHOD

☒ Auger ☐ Bored ☐ Mud Rotary
☐ Driver ☐ Jetted ☐ Air Rotary
☐ Cable Tool ☐ Washed ☐ Reverse Rotary
☐ Other (Specify): _____

Total Depth Of Excavation (Feet BGS): 35Construction Date: 6/28/16

CASING INSTALLATION:

	INNER	OUTER (1)	OUTER (2)	OUTER (3)
Casing Top (Inches AGS):	<u>+2</u>			
Casing Bottom (Feet BGS):	<u>20</u>			
Casing Diameter (Inches):	<u>2</u>			
Casing Material:	<u>PVC</u>			
Gravel Pack Size (#)	<u>1</u>			

AGS=Above Ground Surface BGS=Below Ground Surface

SCREEN INSTALLATION:

Screen Top (Feet BGS): 20
Screen Bottom (Feet BGS): 30
Screen Diameter (Inches): 2
Screen Material: PVC
Screen Slot Size (1000 of an Inch): 0.50

WELL USE:

☐ Domestic ☐ Industrial ☐ Heat Pump Supply
☐ Irrigation ☐ Public ☐ Heat Pump Recharge
☐ Agricultural ☐ Misc. Public ☐ Closed Loop Heat Pump
☐ Agricultural/Lawn Irrigation
☒ Other (Specify): Monitoring

TYPE OF PERMANENT PUMP INSTALLED:

Pump Manufacturer: N/A Horsepower: _____
Rated Capacity: _____ (GPM) Pump Intake Scheduling (BGS): _____
Pump Type: ☐ Submersible ☐ Jet ☐ Vertical Turbine Pump
Pump Installed By: _____ ☐ Others Date: _____

Gravel Pack: From: 16 Feet To: 35 Feet
Grout Type: ☐ Bentonite Clay ☒ Cement ☒ Bentonite Clay Plug
Other: _____ From: 0 Feet To: 16 Feet

Type Of Non-Grout Backfill Of Well Annulus:

From: _____ Feet To: _____ Feet

Static Water Level: 12 Feet ☒ Below ☐ Above Ground Surface

Pumping Water Level: _____ Feet On (Date): _____

After: _____ Hours Pumping Rate: _____ GPM

Pumping Method /Device: ☐ Airlift ☐ Mechanical (Pump) Other: _____Was A Geophysical Log Taken? ☐ Yes ☒ No If "Yes", By: _____

WELL HEAD COMPLETION:

Type: ☐ Pile-in Adapter ☐ Standard "T"
☐ Well Pin ☐ Pad Mount

☒ Other - Specify: Protective casingWell Head Completed: 24 Inches ☒ Above ☐ Below Ground Surface

Was The Well Tag Attached In Accordance With Current Regulations?

☒ YES ☐ NO If "NO", Please Explain: _____

Site Plan - If different from original application, must note changes such as
distances from well to house, property lines, nearest road, and all nearby septic
systems and central sewer lines (included suitable plot plan if available).

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
ACCURATE AND CORRECT.

Signature - Well Driller In Charge of Well Construction
L. Horsay

Well Driller License # 53261 Date 6/28/16

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST
BE RETURNED WITHIN 30 DAYS OF
CONSTRUCTION DATE

FORMATION LOG

PAGE 2 OF 2 PAGES

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

[illegible]

Well 106R

A.C. SCHULTES OF DELAWARE, INC.
P.O. BOX 188 - BRIDGEVILLE, DE 19933

PHONE: 302-337-8254
FAX: 302-337-8234

DRILLER'S LOG

CUSTOMER: **NRG-INDIAN RIVER PLANT** JOB #: **7089**
ADDRESS: 29146 POWER PLANT RD, DAGSBORO, DE 19939 DATE: 6/28/2016
LOCATION: **SAME**

		FT FROM GROUND		WELL LOG
GROUND	2'	SURFACE	0 TO	
30' T O T A L D E P T H	CASING	0-1'	TOPSOIL	
		1-4'	FINE-MED TAN SAND	
		4-13'	MED TANNISH ORANGE SAND W/ROCKS	
		13-35'	FINE-COARSE TAN SAND W/SOME GRAVEL	
	SCREEN			

WELL NO:	MW#106	PUMPED WITH:	AIR	SLOT SIZE:	.020
WELL DIAMETER:	2"	CASING DIAMETER:	2"	SCREEN DIAMETER:	2"
WELL DEPTH:	30'	CASING TYPE:	PVC	SCREEN TYPE:	PVC
STATIC LEVEL:	11.85'	CASING DEPTH:	20'	SCREEN LENGTH:	10'
PUMPING LEVEL:	-	GROUT TYPE:	CEMENT/BENTONITE	GRAVEL SIZE:	#1
TEST CAPACITY:	-	GROUT DEPTH:	0-16'	GRAVEL DEPTH:	16-35'
SPEC. CAPACITY:	-	GROUT AMOUNT:	4 BAGS	GRAVEL AMOUNT:	3 BAGS
HRS PUMPED:	4	DRILLING RIG:	D-1		

PERMIT #: 254860 FOREMAN: L. HORSEY HELPER: G. WRIGHT
AUTHORIZATION #: 4915724 LATITUDE: N38.57612 LONGITUDE: W075.23444

Well 106R

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: NRG Indian River Well Replacement 106R and 105BR for Wells 106 and 105B
 PROJ. NO.: 153852 BORING NO.: 106R
 COORDINATES: EAST: NORTH:
 ELEVATION: SURFACE: TOP OF PVC CASING:

Rig: Truck Mount CME 75					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Core Barrel				
Size (ID)	1-3/8" ID		4-1/4"		6/27/2016	0-25	Abandoned 1st hole	
Length	2 ft.		5 ft.		6/28/2016	0-30	80's, rain	
Type	Steel	HAS			6/29/2016		80's sunny	10.4
Hammer Wt.	140 lbs.				6/30/2016	Finished	80's sunny	
Fall	30 "							

Remarks: Truck Mount CME 75, HSA - 4-1/2" ID, 140 lbs. Automatic Hammer, 30" drop, steel casing is outer protective surface casing with locakable lid, PVC well cap and NRG keyed lock

SAMPLE TYPE				WELL INFORMATION			
S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample				Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
				PVC Casing	2"	-2.5	20
				PVC Well Screen - 10 slot	2"	20	30

Depth (Ft.)	Sample Type & No.	Sample Rec. (FL, %)	SPT	USCS	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
1					Sand, grey, brown, dry to damp, loose, fine to medium sand	2.8 ft. PVC	
2					5 ft. outer protective steel casing placed in concrete, Stickup 2.8 ft.	Stickup Concrete 0 to 3.0 ft.	
3	A-N					3.0	
4						Cement	
5	5.0					Bentonite	
6	S-1	2	4	SP	SAND, brown, tan, damp, loose, fine to medium sand	Grout 3 ft. to 14 ft.	
7	7.0	1	4			PVC Casing -2.5 ft to 20 ft.	
8			3				
9	A-N						
10	10.0						
	S-2	2	1	SP	Match to Sheet 2		

DRILLING CO.: A.C. Schultes
 DRILLER: Larry Horsey

BAKER REP.: Brian Davis
 BORING NO.: 106R SHEET 1 OF 3

Well 106R

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: NRG Indian River Well Replacement 106R and 105BR for Wells 106 and 105B
 PROJ. NO.: 153852 BORING NO.: 106R
 COORDINATES: EAST: NORTH:
 ELEVATION: SURFACE: TOP OF PVC CASING:

Rig: Truck Mount CME 75					Date	Progress (Ft.)	Weather	Depth to Water (Ft.)
	Split Spoon	Casing	Augers	Core Barrel				
Size (ID)	1-3/8" ID		4-1/4"		6/27/2016	0-25	Abandoned 1st hole	
Length	2 ft.		5ft		6/28/2016	0-30	80's, rain	
Type	Steel		HAS		6/29/2016		80's sunny	10.4
Hammer Wt.	140 lbs.				6/30/2016	Finished	80's sunny	
Fall	30 "							
Remarks: Truck Mount CME 75, HSA - 4-1/2" ID, 140 lbs. Automatic Hammer, 30" drop, steel casing is outer protective surface casing with locakable lid, PVC well cap and NRG keyed lock								
SAMPLE TYPE S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample					WELL INFORMATION			
					Type	Diam.	Top Depth (Ft.)	Bottom Depth (Ft.)
					PVC Casing	2"	-2.5	20
					PVC Well Screen - 10 slot	2"	20	30
Depth (Ft.)	Sample Type & No.	Sample Rec. (FL, %)	SPT	USCS	Visual Description	Well Installation Detail		Elevation (Ft. MSL)
1					Sand, grey, brown, dry to damp, loose, fine to medium sand	2.8 ft		
2						PVC		
3	A-N				5 ft. outer protective steel casing placed in concrete, Stickup 2.8 ft.	Stickup		
4						Concrete		
5						0 to 3.0 ft.		
6	S-1	2	4	SP	SAND, brown, tan, damp, loose, fine to medium sand	3.0		
7		1	8			Cement		
8			4			Bentonite		
9	A-N		3			Grout		
10						3 ft. to		
						14 ft.		
						PVC		
						Casing		
						-2.5 ft to		
						20 ft.		
	S-2	2	1	SP	Match to Sheet 2			

DRILLING CO.: A.C. Schultes
 DRILLER: Larry Horsey

BAKER REP.: Brian Davis
 BORING NO.: 106R SHEET 1 OF 3

TEST BORING AND WELL CONSTRUCTION RECORD

PROJECT: NRG Indian River Well Replacement 106R and 105BR for Wells 106 and 105B
 CTO NO.: 153852 BORING NO.: 106R

SAMPLE TYPE S = Split Spoon A = Auger T = Shelby Tube W = Wash R = Air Rotary C = Core D = Denison P = Piston N = No Sample						DEFINITIONS SPT = Standard Penetration Test (ASTM D1586)		
Depth (Ft.)	Sample Type & No.	Sample Rec. (Ft.,%)	SPT	Lab ID	PID (ppm) ps/bg	Visual Description	Well Installation Detail	Elevation (Ft. MSL)
31	A-N					Continued from Sheet 2		Sand 16 ft. to 35 ft.
32						Borehole backfilled with Sand Pack from 30 ft. to 35 ft.		
33								
34								
35								
35.0								35.0
36						End of Boring at 35 ft.		
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
						Match to Sheet 4		

DRILLING CO.: A.C.Schultes
 DRILLER: Larry Horsey

BAKER REP.: Brian Davis
 BORING NO.: 106R SHEET 3 OF 3

Well 107A

Project Delmarva Power and Light Company
Indian River Power PlantBoring No. 107A Ground Elev. 21.5Station See Plan Offset _____

Started _____ Date Completed _____

Remarks _____

Michael Baker, Jr., Inc.
Test Boring RecordSHEET 1 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)
						10	20	30	40	50	
19.5		s	1	SAND, med-crs gr, gry-brn, med dns, damp, qtz, w/roots							
	5	s	2	SAND and GRAVEL, some clay, tr org, gry, dns, qtz	SP- SM						13.9
16.0		s	3	CLAYEY SILT and f. SAND, gry- or, med dns, damp	SM						19.8
13.0	10	s	4	SAND, v f gr, silty, gry, med dns, damp, qtz							
9.5		s	5	SAND, med gr, gry, damp, qtz							
6.5	15	s	6	SAND, med-crs gr, gry, med dns, wet, qtz							
	20										
-1.5		s	7								
	25	s	8	SAND, med-crs gr, tr gravel, gry, med dns, wet							
				(water surged into hole at a depth of about 26 feet)							
	30	s	9								
-9.5											
		s	10	SILT & f sand SAND, f gr, silty, tr gravel, lss-med dns, wet, qtz							
	35										
		s	11								
	40										

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 107A

Project Delmarva Power and Light Company
Indian River Power Plant
 Boring No. 107A Ground Elev. _____
 Station _____ Offset _____
 Date Started _____ Date Completed _____
 Remarks _____

Michael Baker, Jr., Inc.
 Test Boring Record

SHEET 2 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot 10 20 30 40 50	Water Content (%)
		s	12	SAND, med-crs gr, tr gravel, gry, med dns, wet	SW- SM		19.2
	45	s	13				
-25.5							
	50	s	14	SAND, med-crs gr, tr silt, tr gravel, gry, med dns, wet			
-29.5							
	55	s	15	SAND, f-med gr, tr silt, gry, dns, wet			
-33.5							
		s	16	SAND, f-med gr, tr silt, tr gravel, gry, med dns, wet			
-37.5	60	s	17	SAND, med-crs gr, tr silt, gry, wet			
-39.5							
	65			END OF BORING @ 61.0'			
				DEPTH SCREENED: 51.0'-61.0'			

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 107A

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:
Water Supply Section
Division of Environmental Control
Hall Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
APPLICATION FOR A PERMIT TO DRILL A WELL
To be completed by a licensed water well driller)

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILLING
IS STARTED.

Owner: Delaware Power & Light Co.
Telephone Number: 519 434-1000
Mailing Address: P.O. Box 1097
D.C. Newark Del. 19711
County _____ Zip _____

Date of Application: _____ Mon. _____ Day _____ Year _____
Estimated Date of Construction: _____
Driller: WILSON CORP. License No. 52
Pump Installer: _____ License No. _____

WELL INFORMATION (circle one)

Purpose: Test Well - Permanent Well - Option to convert
Use: Domestic - Public - Commercial
Industrial - Agriculture - Other
Describe Other: monitor
Is this a replacement well? yes no
Reason for replacement: _____
Date abandoned well is to be sealed: _____
How _____
Has an application been made for an approved sewage
disposal system? yes - no
Permit Number: 111A

LOCATION MAPS

Enclosed: From
Michael Baler Jr. Inc.
4301 Dutch Ridge Rd.
Box 280
Beaver, PA. 15009

Road Map

PROPOSED WELL CONSTRUCTION

Method of drilling: Auger
Approximate total depth of well: 25 ft.
Name of aquifer: Quaternary Sand
Casing diameter (s) 2 I D
inner to outer (in.)
Casing Material: PVC
Screen Material: PVC
Tentative Screen Setting: between 15 and 25 ft.
Estimated length of screen: 10 ft.
Will the well be gravel packed? yes no
Type of grout: grout From: 15 ft. to 0 ft.
Desired capacity of the well: 1 gpm
Maximum daily use: None gpd

INDIAN RIVER POWER STA.
Well # 107A

I hereby affirm the information I have furnished
is accurate and correct.

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. -- Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed: ()

is permit expires: 10/14/82

SIGNED: Lin A. Smith

A completion report must be filed with the Division of Environmental
Control within twenty-one (21) days after completion of this well.
Failure to do so may result in license suspension.

Permit Number: 49757
Report filed _____

Well 107A

PLEASE RETURN TO:

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 40-08/78/01/



WELL COMPLETION REPORT

1. Permit Number: <u>49757</u> Owner of well: <u>DPL Indian River #107-A</u>	11. Gravel pack: Type <u>N/A</u> From _____ to _____ feet																		
2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u>	12. Static Water Level: Date <u>10/19/81</u> <u>16</u> Ft. (Below, Above) Ground Surface																		
3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Auger</u>	13. Pumping Water Level: <u>N/A</u> Ft. below grade after _____ hours at _____ gpm																		
4. Test Well ☒ Observation ☐ Production ☐	14. Well Head Completion: Type: Pitless Adapter ☐ Other <u>1.5' PVC</u> <u>Stick-up</u> inches above grade																		
5. Total Well Depth: <u>61</u> feet Date Completed <u>10/20/81</u> Month Day Year	15. Type of Permanent Pump Installed: Pump Manuf. <u>N/A</u> Rated capacity _____ Pump intake setting _____ Ft. below grade																		
6. If this is a replacement well, how was previous well abandoned? <u>N/A</u>	16. The completed well is <table border="0"> <tr> <td></td> <td>YES</td> <td>NO</td> </tr> <tr> <td>a. at least 5' from any overhang.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>b. at least 50' from any septic tank.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>c. at least 10' from town sewer line.....</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>d. at least 100' from the nearest edge of any tilefield..... (if well is cased less than 50')</td> <td>☒</td> <td>☐</td> </tr> <tr> <td>e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....</td> <td>☒</td> <td>☐</td> </tr> </table>		YES	NO	a. at least 5' from any overhang.....	☒	☐	b. at least 50' from any septic tank.....	☒	☐	c. at least 10' from town sewer line.....	☒	☐	d. at least 100' from the nearest edge of any tilefield..... (if well is cased less than 50')	☒	☐	e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....	☒	☐
	YES	NO																	
a. at least 5' from any overhang.....	☒	☐																	
b. at least 50' from any septic tank.....	☒	☐																	
c. at least 10' from town sewer line.....	☒	☐																	
d. at least 100' from the nearest edge of any tilefield..... (if well is cased less than 50')	☒	☐																	
e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth.....	☒	☐																	
7. Casing Material: Steel ☐ PVC ☐ Concrete ☒ Diameter <u>2</u> in. From <u>0</u> to <u>51</u> feet	17. The nearest neighbors (circle one) <u>septic tank</u> tile field, <u>cesspool</u> , or privy is <u>~1200'</u> from completed well.																		
8. Screen Material: Steel ☐ PVC ☐ Concrete ☐ Diameter <u>2</u> inches Setting from <u>51</u> to <u>61</u> feet	18. Is completed well located as shown on application form? ☒ If no, describe location change.....																		
9. Grout Type: Cement ☒ Bentonite Clay ☐ Other _____ From <u>0</u> to <u>3</u> feet																			
10. Non-grout Backfill of Well Annulus Type <u>Natural materials</u> From <u>0</u> to <u>61</u> feet	Company Name _____ Signature of Water Well Contractor _____ Date _____																		

10/11

Baker

LOG OF BORING NO.: **Well P-3R****P-3R**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **1** OF **2**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/29/2010** END: **9/29/2010**NORTH: **210,634.03** EAST: **551,207.88**COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____

BASELINE: _____

DRILLER: **Chris**EQUIPMENT: **Geoprobe 662 ODT**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1: **11.0** TIME: **15:41** DATE: **9/29/2010** DESCRIPTION: **First encountered** INCLINATION: **0**
 WATER DEPTH 2: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ ELEV. DATUM: **NAVD88**
 WATER DEPTH 3: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ GROUND ELEV.: **12.71**

SAMPLE DEPTH (FT.)	SAMPLE TYPE -NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
0.0						-3 -2 -1 0		
	DP-1	80%				1 2 3 4 5	SAND, trace silt; yellow; dry; loose; sand is fine.	0.0' - EL 12.7
5.0						6 7 8 9 10	SAND with silt; light brown; moist; loose; sand is fine.	5.0' - EL 7.7
	DP-2	80%				11 12 13	SAND; orange; wet; loose; sand is fine to medium.	10.0' - EL 2.7
10.0						14 15 16 17	SILT, some sand; gray; wet; loose; sand is fine.	11.0' - EL 1.7
	DP-3	80%				18 19 20	SAND, trace silt; gray; wet; loose; sand is fine.	13.0' - EL -3.3
15.0						21 22 23 24	SAND AND GRAVEL; light yellow; wet; medium dense; sand is fine to coarse; gravel is fine.	15.0' - EL -2.5
	DP-4	100%				25 26 27 28	SAND; gray to light gray; wet; medium dense; sand is fine to medium.	16.0' - EL -3.3

TEMPLATE: BKT-AE FILE: IPRC-2010-050 DATE: PRINTED: 12/10/2010 5:04:12 PM

Baker

LOG OF BORING NO.: **Well P-3R****P-3R**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **2** OF **2**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/29/2010** END: **9/29/2010**NORTH: **210,634.03** EAST: **551,207.88** COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Chris**EQUIPMENT: **Geoprobe 662 ODT**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1: **11.0** TIME: **15:41** DATE: **9/29/2010** DESCRIPTION: **First encountered** INCLINATION: **0**
 WATER DEPTH 2: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ ELEV. DATUM: **NAVD88**
 WATER DEPTH 3: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ GROUND ELEV.: **12.71**

SAMPLE DEPTH (FT.)	SAMPLE TYPE -NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (RQD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
20.0						18		
						19		
						20		
						21		
						22		
	DP-5	0%				23		
						24		
25.0						25		
						26	SAND, (local silt, light gray, wet) medium dense, sand is fine	
						27		
	DP-6	100%				28		
						29		
30.0						30	End of Boring at 30.0 feet.	
						31		
						32		
						33		
						34		
						35		
						36		
						37		
						38		

TEMPLATE: BAK-LOG-11-5-4-10-2010 USED DATE: 9/29/2010 5:04 PM 12/25/09

sleeve shredded on removal

25.0' - EL. -12.3

30.0' - EL. -17.3

Baker

WELL INSTALLATION LOG NO.:

Well P-3R

P-3R

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill

SHEET: 1 OF 2

LATITUDE: LONGITUDE: GEO. DATUM:

START: 9/29/2010 END: 9/29/2010

NORTH: 210,634.03 EAST: 551,207.88 COORD. DATUM: NAD27

LOGGER: Kenneth A Tua

STATION: OFFSET: BASELINE:

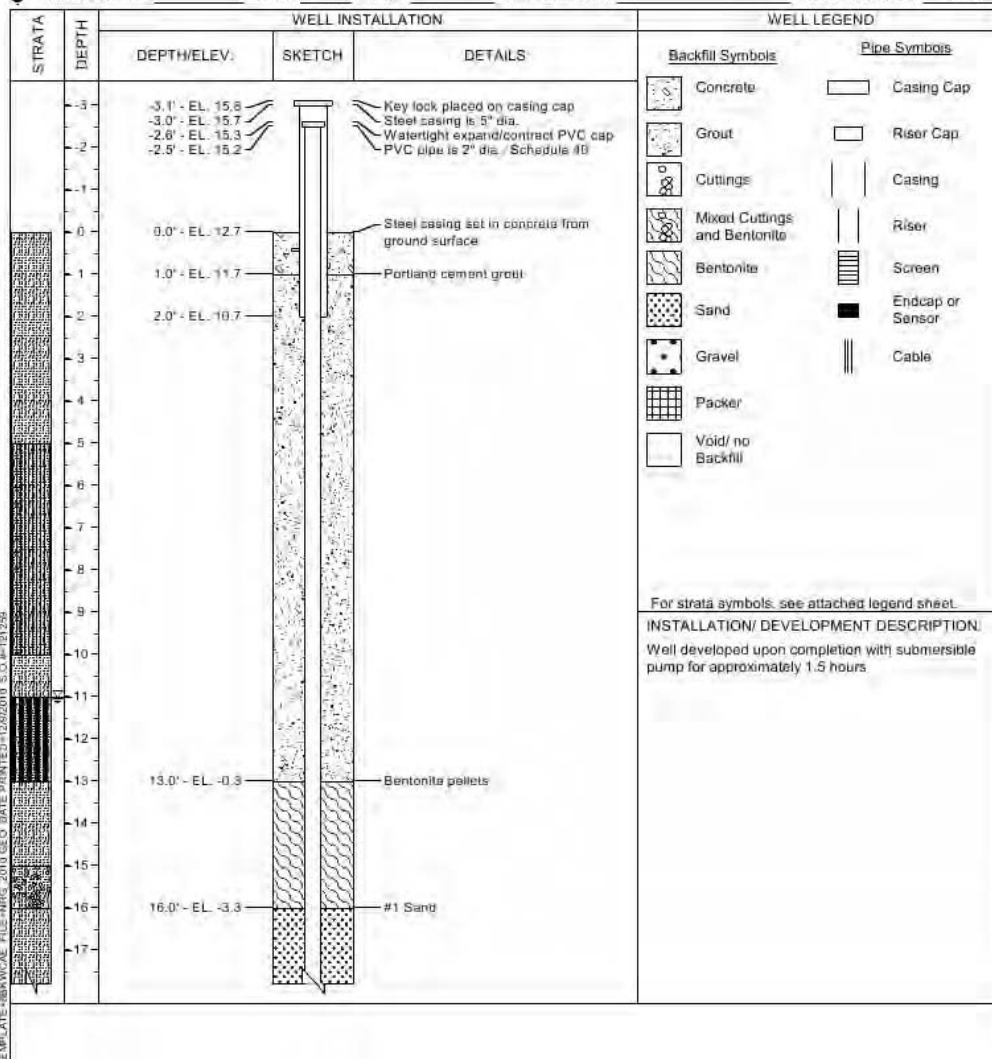
DRILLER: Chris

EQUIPMENT: Geoprobe 662 ODT

DRILL CO.: Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA Direct push sampler

WATER DEPTH 1:	11.0	TIME:	15:41	DATE:	9/29/2010	DESCRIPTION:	First encountered	INCLINATION:	0
WATER DEPTH 2:		TIME:		DATE:		DESCRIPTION:		ELEV. DATUM:	NAVD83
WATER DEPTH 3:		TIME:		DATE:		DESCRIPTION:		GROUND ELEV.:	12.71



TEMPLATE: BAKWV06 FILE: NRG 2010 GEO DATE PRINTED: 12/22/2010 5:03 PM 12/25



WELL INSTALLATION LOG NO.:

Well P-3R

P-3R

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill

SHEET: 2 OF 2

LATITUDE: LONGITUDE: GEO. DATUM:

START: 9/29/2010 END: 9/29/2010

NORTH: 210,634.03 EAST: 551,207.88 COORD. DATUM: NAD27

LOGGER: Kenneth A Tua

STATION: OFFSET: BASELINE:

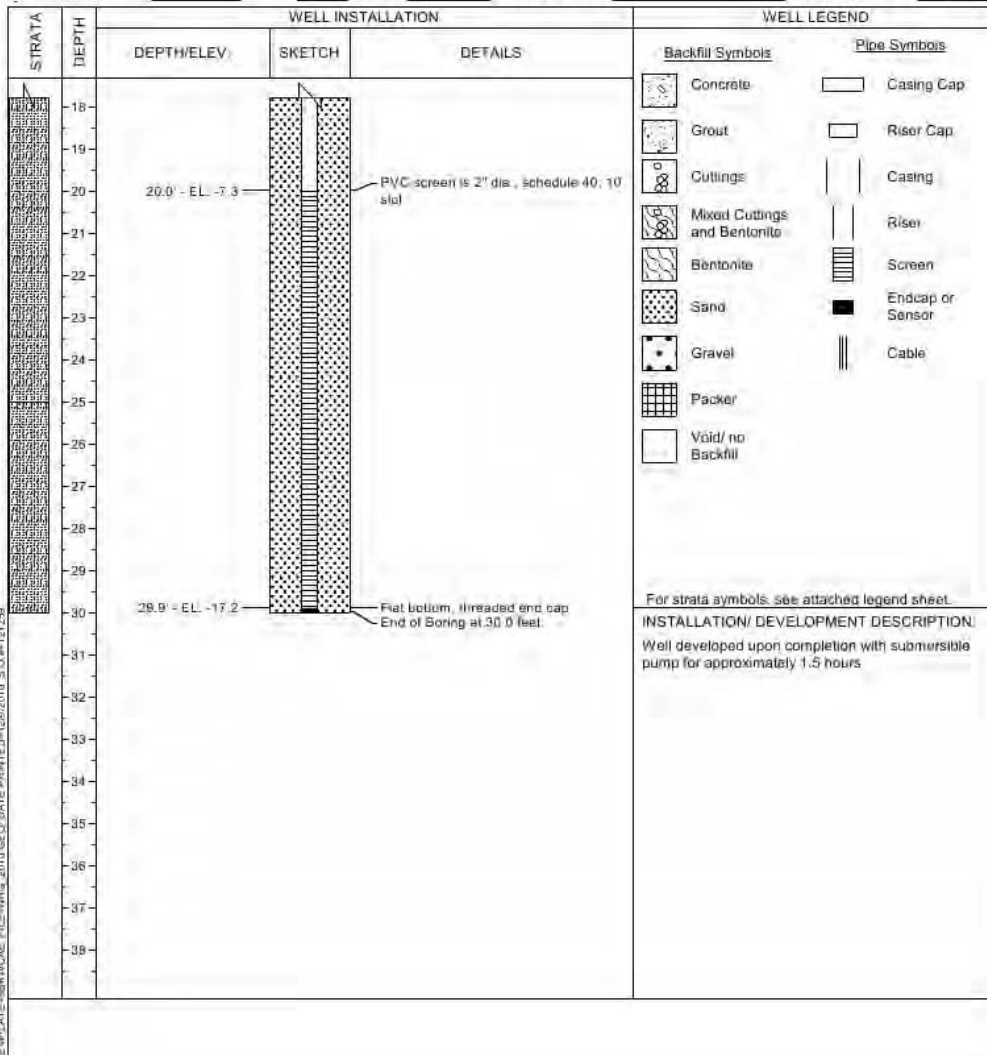
DRILLER: Chris

EQUIPMENT: Geoprobe 662 ODT

DRILL CO.: Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA Direct push sampler

WATER DEPTH 1:	11.0	TIME: 15:41	DATE: 9/29/2010	DESCRIPTION: First encountered	INCLINATION: 0
WATER DEPTH 2:		TIME:	DATE:	DESCRIPTION:	ELEV. DATUM: NAVD88
WATER DEPTH 3:		TIME:	DATE:	DESCRIPTION:	GROUND ELEV.: 12.71



TEMPLATE: BHWOLE FILE: WING 2010 CED DATE PRINTED: 10/2/2010 5:04:12 PM

Well P-3R

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT
MUST BE RETURNED WITHIN 30
DAYS OF CONSTRUCTION. A
WELL FORMATION LOG MUST BE
INCLUDED WITH THIS REPORT.

-Authorization Number-

6680870

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 232741 Local ID: P-3R
Tax Map/Parcel #: _____
Property Owner: Indian River Power LLC
Water Well Contractor: Earthbytes Inc WC Lic #: 1218
Well Driller in Charge during Construction: Paul W. Prick

WELL CONSTRUCTION METHOD

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify): _____
Total Depth of Excavation: 30'
Construction Date: 9-29-10

CASING INSTALLATION:

INNER CASING

CASING TOP: 2 1/2' Above Ground
CASING BOTTOM: 20'
CASING DIAMETER: 2"
CASING MATERIAL: PVC

OUTER CASING

(1) (2) (3)
CASING TOP: 2 1/2' Above Ground _____
CASING BOTTOM: 2 1/2' _____
CASING DIAMETER: 3" _____
CASING MATERIAL: Steel _____

SCREEN INSTALLATION

SCREEN TOP: 20'
SCREEN BOTTOM: 30'
SCREEN DIAMETER: 24"
SCREEN MATERIAL: PVC

SCREEN SLOT SIZE: .010 /THOUSANDSGRAVEL PACK SIZE: #2 Sand

Gravel Pack From: 30 ft. To: 18' ft.
Grout Type: Catland ☒ Cement 16lb Mug ☒ Bentonite Clay
☐ Other: _____ From: 18' ft. To: 0' ft.
Type of Non-Grout backfill of Well Annulus: NONE
From: N/A To: N/A
Static Water Level: 14' ft. ☐ Below OR ☐ Above Ground Surface
On (date): 9-29-10
Pumping Water Level: _____ ft. On (date): _____
After: _____ hrs. Pumping at: _____ GPM
Was a Geophysical Log Taken? ☒ YES ☐ NO

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☒ Pad Mount
☐ Other - Specify: _____

Well Head Completed: 30' inches ☒ Above (OR) ☐ Below Ground Surface

Was the Well Tag attached in accordance with current regulations?

☒ YES ☐ NO If "NO", Please Explain: _____

Site Plan - Include lot size and dimensions, distances from well to house, property lines, nearest road, and all nearby septic systems (include suitable plot plan if available). (If different from original application)

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
ACCURATE AND CORRECT.

Paul W. Prick DS10-081
Signature - Well Driller in Charge of Well Construction

5318 9-29-10
License # Date

Well P-3R

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-5665
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

<http://www.dnrec.state.de.us/>

WELL ABANDONMENT REPORT MUST BE
RETURNED WITHIN 30 DAYS OF
ABANDONMENT.

WELL or SOIL BORING
ABANDONMENT REPORT

- OFFICIAL USE ONLY -

PAGE 1 OF 1 PAGES
PERMIT #: 232741

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE TYPE OR PRINT - USE BLUE OR BLACK INK ONLY

Permit # of Abandoned Well: 232741
Replacement Well Permit #: 232741
Local ID: P-3R Tax Map/Parcel #:

Property Owner: Indian River Power LLC
Well Contractor: Eichelberger Lic. #: 4218
Well Driller in Charge: Paul Wierick Lic. #: 5348
Construction Date of Abandoned Well/Soil Boring: 9-29-10
Abandonment Date: 9-29-10

WELL CONSTRUCTION METHOD (if known):

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify):

PROVIDE A LOCATION SKETCH OF ABANDONED WELL(S)
Draw a sketch below showing location of well in relation to at least two county
or state roads, give distance from site to nearest road junction and SHOW A
NORTH ARROW.

WELL ABANDONMENT:

Casing Material: PVC
Casing Diameter (inches): 2"
Well Depth: 30'
Was any Casing Removed? ☐ NO ☒ YES
If YES, Amount of Casing Removed (feet): 5'
Was Casing Ripped or Perforated? ☒ NO ☐ YES
Type of Sealing Material Used: Portland
Sealed From: 30' ft. To: 0' ft.

NOTE: If this form is submitted in place of a completion report for
wells or soil borings installed and abandoned on the same date, a
formation log must be attached. Formation logs must be submitted
on forms provided by DNREC.

The abandonment of this well(s) or soil boring(s) is in compliance with
all permit conditions and with all applicable well construction
regulations.

☒ YES ☐ NO

COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED
IS ACCURATE AND CORRECT.

Signature: Christopher L. Brummen
Licensed Driller in Charge of Abandonment

4250 9-29-10
Well Driller License # Date

- FOR OFFICIAL USE ONLY - DO NOT WRITE BELOW THIS LINE -

Received By: Modified Grid: DRBC: ☐ YES ☐ NO X-Coord: _____
Amount: Drainage Basin: H₂O Utility: Y-Coord: _____
Date: Quad: Flood Zone/Coastal: DOT #: _____

White - DNREC • Canary - Contractor • Pink - Owner

Doc No. 40-08/87/02/03

Downgradient Wells

Well 102A

Project Dalmatva Power and Light Company
Indian River Power PlantBoring No. 102A Ground Elev. 14.1Station See Plan Offset _____Date Started 10/26/81 Date Completed 10/26/81

Remarks _____

Michael Baker, Jr., Inc.
Test Boring RecordSHEET 1 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)	
						10	20	30	40	50		
		s	1	SAND, f-med gr, tr silt, brn, lsc-med dns, damp, qtz								
	5	s	2									
	10	s	3		SP- SM						4.5	
3.1		s	4	SAND, f-crs gr, ltl silt, gry, med dns, wet, qtz								
-0.9	15	s	5	SAND, f-crs gr, ltl gravel, gry, med dns, wet, qtz								
-4.9	20	s	6	SAND, f-crs gr, some silt, tr gravel, gry, med dns, wet, qtz								
	25	s	7									
	30	s	8									
-16.9		s	9	SAND, f-crs gr and GRAVEL, tr silt, gry, med dns - dns, wet, qtz								
	35											
		s	10		SW- SM						15.6	
	40											

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 102A

Project Delmarva Power and Light Company
Indian River Power PlantBoring No. 102A Ground Elev. _____

Station _____ Offset _____

Started _____ Date Completed _____

Remarks _____

Michael Baker, Jr., Inc.
Test Boring RecordSHEET 2 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)
						10	20	30	40	50	
-20.4	45	s	11	SAND, f-crs gr, ltl silt, ltl gravel, gry, med dns, wet, qtz							
		s	12	SAND, f-crs gr, ltl silt, tr gravel, gry, dns, wet, qtz							
		s	13								
-36.9	50										
		s	14	SAND, f-crs gr, tr silt, gry, dns, wet, qtz							
-40.9	55										
-43.9		s	15	SAND, f-crs gr and GRAVEL, tr silt, or, dns, wet, qtz							
	60			END OF BORING @ 58.0'							
				DEPTH SCREENED: 48.0'-58.0'							

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 102A

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:
Water Supply Section
Division of Environmental Control
Tatnall Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

APPLICATION FOR A PERMIT TO DRILL A WELL

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILL
IS STARTED.

To be completed by a licensed water well driller)

Owner: Delmarva Power and Light Co.
Telephone Number: 410 394 1097
Mailing Address: P.O. Box 1097
100 Newark, DE 19711
County _____ Zip _____

Date of Application: 12 Mon. 1 Day 31 Year
Estimated Date of Construction: 12/5/82
Driller: WILLIAM C. P. License No. 52
Pump Installer: _____ License No. _____

WELL INFORMATION (circle one)

Purpose: Test Well - Permanent Well - Option to convert
Use: Domestic - Public - Commercial
Industrial - Agriculture - Other
Describe Other: Monitor

Is this a replacement well? yes ☒ no

Reason for replacement: _____

Date abandoned well is to be sealed: _____

How _____

Has an application been made for an approved sewage
disposal system? yes - noPermit Number: D/A.

LOCATION MAPS

Enclosed: From
Michael Baker Jr. Inc.
4301 Dutch Ridge Rd.
Box 280
Beaver, DE 15009

Road Map

PROPOSED WELL CONSTRUCTION

Method of drilling: Auger
Approximate total depth of well: 25 ft.
Name of aquifer: CLAYBARI SAND
Casing diameter (s)
inner to outer (in.) 2 1/2 4
Casing Material: PVC
Screen Material: PVC
Tentative Screen Setting: between 15 and 25 ft.
Estimated length of screen: 10 ft.
Will the well be gravel packed? ☒ yes ☐ no
Type of grout: SCUMPTON SILE From: 15 ft. to 0 ft.
Desired capacity of the well: 1 gpm
Maximum daily use: _____ gpd

I hereby affirm the information I have furnished
is accurate and correct

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. - Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed: ()

This permit expires: 12/14/82

SIGNED:

A completion report must be filed with the Division of Environmental
Control within twenty-one (21) days after completion of this well.
Failure to do so may result in license suspension.

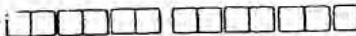
Permit Number: 49746
Report filed _____

Well 102A

PLEASE RETURN TO:

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 40-08/78/01/



WELL COMPLETION REPORT

1. Permit Number: <u>49746</u> Owner of well: <u>DP + L Indian River #102-A</u>	11. Gravel pack: Type <u>#1 Gravel</u> From <u>48</u> to <u>58</u> feet
2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u>	12. Static Water Level: Date <u>10/26/81</u> <u>12</u> Ft. (Below, Above) Ground Surface
3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Augers</u>	13. Pumping Water Level: <u>N/A</u> Ft. below grade after _____ hours at _____ gpm
4. Test Well ☐ Observation ☒ Production ☐	14. Well Head Completion: Type: Pitless Adapter ☐ Other <u>1.5' PVC</u> <u>stick-up</u> inches above grade
5. Total Well Depth: <u>58</u> feet Date Completed <u>10/26/81</u> Month Day Year	15. Type of Permanent Pump Installed: Pump Manuf. <u>N/A</u> Rated capacity _____ Pump intake setting _____ Ft. below grade
6. If this is a replacement well, how was previous well abandoned? <u>N/A</u>	16. The completed well is a. at least 5' from any overhang ☒ ☐ b. at least 50' from any septic tank ☒ ☐ c. at least 10' from town sewer line ☒ ☐ d. at least 100' from the nearest edge of any tilefield (if well is cased less than 50') ☒ ☐ e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth ☒ ☐
7. Casing Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> in. From <u>0</u> to <u>48'</u> feet	17. The nearest neighbors (circle one) <u>septic tank</u> tile field, <u>Cesspool</u> , or privy is <u>2200</u> from completed well.
8. Screen Material: Steel ☐ PVC ☒ Concrete ☐ Diameter <u>2"</u> inches Setting from <u>48'</u> to <u>58'</u> feet	18. Is completed well located as shown on application form? ☒ ☐ If no, describe location change.....
9. Grout Type: Cement ☒ Bentonite Clay ☐ Other _____ From <u>0</u> to <u>3'</u> feet	Company Name _____ Signature of Water Well Contractor _____ Date _____
10. Non-grout Backfill of Well Annulus Type <u>Natural Materials</u> From <u>48</u> to <u>3'</u> feet	

Well 103A

Delmarva Power and Light Company

Project Indian River Power Plant

Boring No. 103A Ground Elev. 19.5

Station See Plan Offset

Started 10/23/81 Date Completed 10/23/81

Remarks

Michael Baker, Jr., Inc.
Test Boring Record

SHEET 1 OF 2

Elevation (ft.)	Depth (ft.)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)
						10	20	30	40	50	
		s	1	SAND, f-med gr, some silt, dk brn med-v dns, damp, qtz (with plant matter to a depth of 3 feet)	SW- SM						
	5	s	2	(moist below a depth of 3 feet)							7.2
	10	s	3								
8.5											
		s	4	SAND, f-med gr, some silt, tr gravel, brn, med dns, moist, qtz							
4.5	15										
		s	5	SAND, f-med gr, ltl silt, lt brn, lse-med dns, wet, qtz							
	20										
		s	6								
-3.5											
	25	s	(7)	SAND, med-crs gr and GRAVEL, tr silt, gry, dns, wet, qtz <i>brn (ref. sample?)</i>							
-7.5											
	30	s	(8)	SAND, f-med gr, some silt, tr gravel, gry, med dns, wet, qtz							
-11.5											
		s	9	SAND, f-med gr, ltl silt, tr gravel, gry, med dns, wet, qtz							
-15.5	35										
		s	10	SAND, f-crs gr, tr silt, ltl gravel, gy & brn, med dns-dns, wet, qtz							
	40										

DRILLING CO. Walton Corporation

INSPECTOR C. J. Coe

Well 103A

Project Delmarva Power and Light Company
Indian River Power PlantBoring No. 103A Ground Elev. _____

Station _____ Offset _____

Date Started 10/23/81 Date Completed 10/23/81

Remarks _____

Michael Baker, Jr., Inc.
Test Boring RecordSHEET 2 OF 2

Elevation (ft)	Depth (ft)	Sample Type	Sample No.	Visual Description	U.S.C.S.	Penetration Resistance Blows Per Foot					Water Content (%)	
						10	20	30	40	50		
		s	11		SW- SM						17.3	
	45	s	12									
-27.5				SAND, f-crs gr, ltl silt, gry, med dns-dns, wet qtz								
	50	s	13									
		s	14									
-35.5	55			SAND, med-crs gr, ltl gravel, tr silt, gry, dns, wet, qtz								
		s	15									
-40.5	60											
-42.5		s	16	SAND, f-crs gr, ltl gravel, ltl silt, gry, med dns, wet, qtz								
				END OF BORING @ 62.0'								
				DEPTH SCREENED: 49.0'-59.0'								

DRILLING CO. Walton CorporationINSPECTOR C. J. Coe

Well 103A

Press Hard - Write Clearly - Use Ball-Point Pen or Typewriter - Press Hard

Mail To:
Water Supply Section
Division of Environmental Control
Ratnall Building P.O. Box 1401
Dover, Delaware 19901
PLEASE PRINT

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL
APPLICATION FOR A PERMIT TO DRILL A WELL
(To be completed by a licensed water well driller)

APPLICATION MUST BE
SUBMITTED AND PERMIT
RECEIVED BEFORE DRILLING
IS STARTED.

Owner: Delmarva Power & Light Co. Date of Application: 10 Mon. 12 Day 8 Year 82
Telephone Number: 916 442 4700 Estimated Date of Construction: 10/15/82
Mailing Address: P.O. Box 1097 Driller: Walter G. G. G. License No. 52
N.C. Delaware De. 19711 Pump Installer: — License No. —
County Zip

WELL INFORMATION (circle one)
Purpose: Test Well Permanent Well - Option to convert
Use: Domestic - Public - Commercial
Industrial - Agriculture - Other
Describe Other: Monitor
Is this a replacement well? yes no
Reason for replacement: —
Date abandoned well is to be sealed: —
How —
Has an application been made for an approved sewage
disposal system? yes - no
Permit Number: N/A

LOCATION MAPS

Enclosed: From
Michael Baker Jr Inc
4301 Dutch Ridge Rd
Box 280
Beaver, Penna. 15009
Road Map

PROPOSED WELL CONSTRUCTION

Method of drilling: Auger
Approximate total depth of well: 25 ft.
Name of aquifer: Quinn Sand
Casing diameter (s): 2 1/2
inner to outer (in.) 0
Casing Material: PVC
Screen Material: PVC
Tentative Screen Setting: between 15 and 25 ft.
Estimated length of screen: 10 ft.
Will the well be gravel packed? yes no
Type of grout: septonite From: 15 ft. to 0 ft.
Desired capacity of the well: 1 gpm
Maximum daily use: None gpd

INDIAN RIVER POWER STA.
Well # 103 A

I hereby affirm the information I have furnished
is accurate and correct

Applicant (circle)
Representative

Site Plan (include suitable plot plan if available)

For Official Use Only. -- Do Not Write Below This Line.

Pursuant to provisions of 7 Delaware Code, Chapter 60, permission is hereby granted to construct and use a well as described above. All current regulations governing well construction and water resource use must be followed. The following conditions must be observed:

This permit expires: 10/14/83

SIGNED: John A. H. H.

A completion report must be filed with the Division of Environmental Control within twenty-one (21) days after completion of this well.
Failure to do so may result in license suspension.

Permit Number: 49749
Report filed —

PLEASE RETURN TO:

WATER SUPPLY BRANCH
Blue Hen Mall Office
Box 1401
Dover, Delaware 19901

DOCUMENT 40-08/78/01/.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

WELL COMPLETION REPORT

1. Permit Number: <u>49749</u> Owner of well: <u>DP&L Indian River #103A</u> 2. Use of water: Domestic ☐ Public ☐ Industrial ☐ Agricultural ☐ Irrigation ☐ Commercial ☐ Other <u>Monitoring</u> 3. Method of Drilling: Jet ☐ Dug ☐ Driven ☐ Rotary: Mud ☐ Rev. ☐ Air ☐ Other <u>Auger</u> 4. Test Well ☐ Observation ☐ Production ☐ 5. Total Well Depth: <u>62</u> feet Date Completed <u>10/23/81</u> Month Day Year 6. If this is a replacement well, how was previous well abandoned? <u>N/A</u> 7. Casing Material: Steel ☐ PVC ☐ Concrete ☒ Diameter <u>2"</u> in. From <u> </u> to <u> </u> feet Screen Material: Steel ☐ PVC ☐ Concrete ☒ Diameter <u>2"</u> inches Setting from <u>49</u> to <u>59</u> feet 9. Grout Type: Cement ☒ Bentonite Clay ☐ Other <u> </u> From <u>0</u> to <u>3'</u> feet 10. Non-grout Backfill of Well Annulus Type <u>Natural materials</u> From <u>0</u> to <u>49</u> feet	11. Gravel pack: Type <u>#1 Gravel</u> From <u>49'</u> to <u>59'</u> feet 12. Static Water Level: Date <u>10/23/81</u> <u>16.5</u> Ft. (Below, Above) Ground Surface 13. Pumping Water Level: <u>N/A</u> Ft. below grade after <u> </u> hours at <u> </u> gpm 14. Well Head Completion: Type: Pitless Adapter ☐ Other <u>1.5' PVC stick-up</u> inches above grade 15. Type of Permanent Pump Installed: Pump Manuf. <u>N/A</u> Rated capacity <u> </u> Pump intake setting <u> </u> Ft. below grade 16. The completed well is a. at least 5' from any overhang... ☒ b. at least 50' from any septic tank... ☒ c. at least 10' from town sewer line... ☒ d. at least 100' from the nearest edge of any tilefield... ☒ (if well is cased less than 50') e. at least 50' from the edge of any tilefield if casing (not including screen) is more than 50' in depth... ☒ 17. The nearest neighbors (circle one) <u>septic tank/tile field, cesspool, or privy</u> is <u>~100'</u> from completed well. 18. Is completed well located as shown on application form? ☒ If no, describe location change..... Company Name <u> </u> Signature of Water Well Contractor <u> </u> Date <u> </u>
---	---

NOV 12 '90 10:10 FROM DP/L ENV.AFFAIRS

PAGE.023

Well 319A

319 A

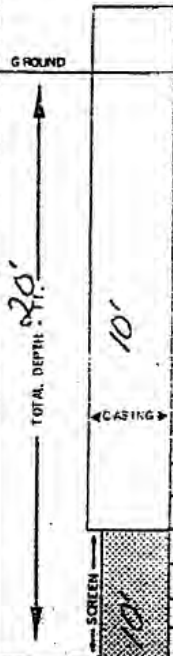
Delmarva Drilling Co., Inc.

P. O. BOX 188

BRIDGEVILLE, DELAWARE 19933

Water Well Contractors

CUSTOMER <u>Delmarva Power</u>		JOB <u>DT5346</u>
ADDRESS <u>Millsboro, Delaware</u>		DATE <u>3/12/80</u>
LOCATION <u>1/2 mile SE of Power Plant Observation Well No. 319A</u>		

GROUND	FEET FROM GROUND SURFACE 0 TO.....	WELL LOG
	0-1	Top Soil
	1-12	Fine to medium brown sand
	12-20	Fine to coarse tan sand
		6" steel protective casing in 5'

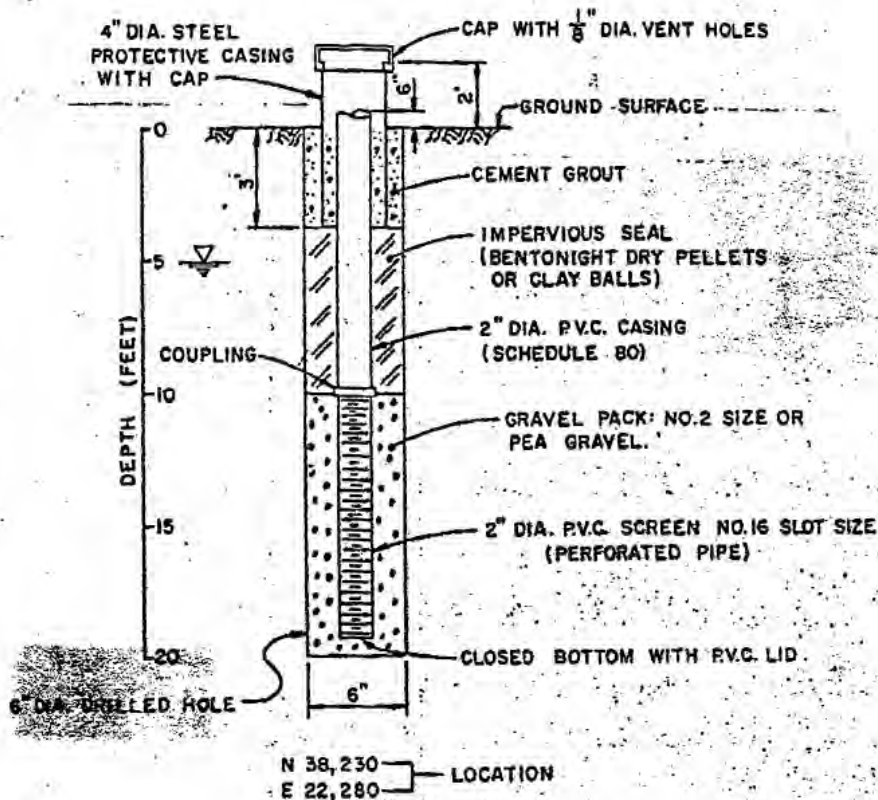
WELL NO. <u>1</u>	DIAMETER OF WELL <u>2"</u>	DEPT. OF WELL <u>20'</u>
HRS. PUMPED <u>2</u>	SLOT SIZE <u>.016</u>	TYPE OF CASING <u>PVC</u>
CAPACITY G.P.M. <u>60</u>	DRILLING MACHINE NO. <u>D3</u>	LENGTH OF CASING <u>10'</u>
STATIC LEVEL <u>6</u>	DRILLER <u>Ed Kelley</u>	DISTANCE TO TOP OF SCREEN <u>10'</u>
PUMPING LEVEL <u>16</u>	GRAVEL <u>2 & 3</u>	TYPE SCREEN <u>PVC</u>
SPECIFIC CAPACITY <u>0</u>	BAGS OF CEMENT <u>2</u>	SIZE OF SCREEN <u>2"</u>
PUMPED WITH <u>pumper</u>	DATE WELL COMPLETED <u>3/12/80</u>	
DEPTH OF CEMENT GROUT <u>0-3</u>	DRILLER'S HELPER <u>E. Myer</u>	
DEPTH GRAVEL PACKED <u>8-20</u>	<u>Ed Kelley</u>	WELL DRILLER'S SIGNATURE

Well 319A

319 A

DELMARVA POWER & LIGHT COMPANY		MADE	CHKD	DRAWING NO.		BY	DATE
INDIAN RIVER STATION UNIT 4		T.E.C.		S-SK15G-1980		1	
CIVIL		SQ LDR		GILBERT ASSOCIATE		IC	
OBSERVATION WELL		END INTL		ENGINEERS AND CONSULTANTS		IS	
NO. 319 A		SCALE		READING, PA.			
		W.O. 044645-1117		J. A. H. Hagan		0674	1/5/80
		REV MADE	CH	SOL APP	DATE	REV MADE	CH

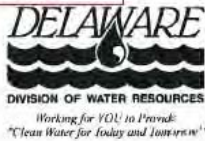
CONSTRUCTION BUILDING PURPOSES RELEASED FOR	ENGR.
	DATE



NOTES:

1. THE P.V.C. MONITORING WELL SHOULD BE AIR DEVELOPED TO YIELD A MINIMUM OF 1 GPM OF CLEAR WATER. THIS WILL ELIMINATE FORMATION OF A SKIN OVER THE INSIDE WALLS OF THE PIPE BY THE FINES SUSPENDED IN THE WATER.
2. LOG THE SOIL STRATIFICATIONS AND GROUND WATER LEVEL DURING DRILLING OF THE BORE HOLE.

Well 319A



****CONTINUE TO USE****
****RECLASSIFIED****
PERMIT
252904



Page 1 of 1

Tax Map Number: 2-33-06.00-0012.00

Pursuant to provisions of Title 7, Delaware Code, Chapter 60, permission is hereby granted to:

NRG Indian River Power LLC
29416 Power Plant Road, Dagsboro, DE 19939 US

to operate and maintain 1 Standard Monitor Well(s) in a total of 1 boring(s)

All current regulations governing well construction shall be followed.

All attached permit conditions shall be complied with.

The applicant is responsible for obtaining all additionally required permits and approvals.

Should the well identification tag become detached and irrecoverable from the well(s), the property owner is responsible to contact the Water Supply section of DNREC at 302-739-9944 for a replacement.

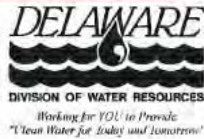
A handwritten signature in dark ink, appearing to read "J. H. McCallister".

12/16/2015

AUTHORIZED SIGNATURE

DATE

Well 319A



**PERMIT
252904**



Page 2 of 1

Well Driller Responsible Conditions

- §16 The well(s) shall be adequately developed.
- §24 The identification tag, supplied by the Department, shall be properly attached to the upper terminus.

Owner/Well Driller Combined Responsibility Conditions

- §1 The approval of this permit does not relieve the responsible party from the requirement for obtaining all permits that are required by federal, state, county, and local governments. The responsible party shall comply with any and all federal, state, county, and local statutes, ordinances, zoning procedures, orders, regulations, rules.
- §2 The issuance of this permit does not guarantee the performance of the permitted well to the standards required by the project. The Department has no knowledge of subsurface conditions or of the constructability of the proposed well.
- §3 This permit is valid only for the specific operations and processes applied for and indicated on the application form and attached drawings. Any unauthorized deviations from the approved project or violations of permit conditions may constitute grounds for revocation. Upon revocation, the well will be ordered abandoned.
- §12 The well casing shall be finished and maintained at least 24 inches above grade.
- §54 Representatives of DNREC, the Delaware Geological Survey or the U.S. Geological Survey may inspect the well and/or conduct tests such as but not limited to geophysical logging and sampling, at any reasonable time after serving advance notice.

Owner Responsible Conditions

- §25 The well(s) shall be capped securely at all times.
- §57 Water taken from this well is not to be used for human consumption.
- §58 The well shall not be used for the processing or preparation of food for sale.
- §64 This permit and all conditions shall transfer to future owners of this property, identified by Tax ID# 2-33-06.00-0012.00.

"Working for You to Provide Clean Water for Today and Tomorrow"

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

WELL 319A

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

<http://www.dnrec.state.de.us/>

APPLICATION FOR A PERMIT TO
CONTINUE THE USE OF or
RECLASSIFY AN EXISTING WELL

- OFFICIAL USE ONLY -

PAGE ____ OF ____

PERMIT NO: 052904

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE TYPE OR PRINT - USE BLUE OR BLACK INK ONLY

Property Owner: NRG INDIAN RIVER POWER LLC
Address: 29416 POWER PLANT ROAD
City: DAGSBORO State: DE Zip: 19939
Telephone Number: 309-924-3602
Licensed Preparer/WC: AJWWS
Lic #: 608 Date of Application: 11/12/15
Approximate Construction Date: 3/12/80

Original Use/Previously Permitted Use: KNOWN AS WELL 319A

- | | |
|--|--|
| ☐ Domestic | ☐ Irrigation |
| ☐ Industrial | ☐ Agricultural |
| ☐ Public | ☐ Heat Pump Supply |
| ☐ Miscellaneous Public | ☐ Heat Pump Recharge |
| ☐ Temporary For Well Construction | ☐ Closed Loop Heat Pump |
| ☒ Monitor/Observation/Recovery | ☐ Test |
| ☐ Other (Specify): | |

Proposed Use:

- | | |
|--|--|
| ☐ Domestic | ☐ Irrigation |
| ☐ Industrial | ☐ Agricultural |
| ☐ Public | ☐ Heat Pump Supply |
| ☐ Miscellaneous Public | ☐ Heat Pump Recharge |
| ☐ Temporary For Well Construction | ☐ Closed Loop Heat Pump |
| ☒ Monitor | ☐ Observation |
| ☐ Other (Specify): | ☐ Recovery |

Previous Well Permit #: UNKNOWN

Is this Well Tagged? Yes ☐ No ☒

On Public Sewage? Yes ☐ Septic System Permit #: _____

WELL CONSTRUCTION

	Inner Casing	Outer Casing
Well Depth	20 ft	5 ft
Casing Top (above grade)	24 in	28 in
Casing Diameter	2 in	4 in
Casing Material	PVC	STEEL
Maximum Capacity: _____ (GPM)	Max Daily Withdrawal: _____ (GPD)	

I HEREBY AFFIRM THE WELL HAS BEEN PHYSICALLY OPENED, DEPTH MEASURED, RECHLORINATED AND TERMINATES ABOVE GRADE.

Signature - Licensed Preparer/Water Well Contractor

Date

Signature - Property Owner

Date

Please release the contractor's copy of the permit and the well tag to the water well contractor noted on this application.

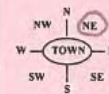
RECEIVED

☒ YES ☐ NO

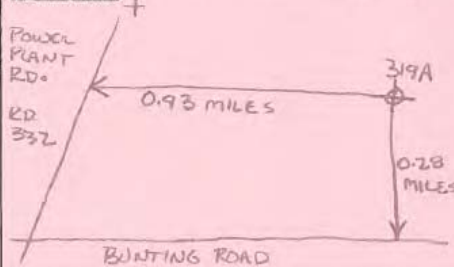
LOCATION MAP - ROAD MAP

County: ☐ New Castle ☐ Kent ☒ Sussex
Subdivision: _____
Lot #: _____ ADC Map Grid: _____
Tax Map/Parcel #: 233-600-1200
Name of Nearest Town: DAGSBORO
Distance to Nearest Town: 2.4 MILES

DIRECTION OF WELL
FROM TOWN
(CIRCLE DIRECTION)



Draw a sketch below showing location of well in relation to two county or state roads, give distance from well site to nearest road junction, and SHOW A NORTH ARROW.



Site Plan - include lot size, dimensions, distances from well to house, property lines, nearest road and all nearby septic systems (include suitable plot plan if available).



*NOTE: APPLICATIONS SUBMITTED FOR WELLS OF UNKNOWN LOCATION WILL NOT BE PROCESSED.

Received By: NOV 20 2015 Modified Grid: 182-0716 DRBC: ☐ YES ☒ NO X - Coord: 21160816.48
Amount: WATER SUPPLY Drainage Basin: Delaware River H2O Utility: _____ Y - Coord: 4238.21
Date: _____ Quad: FRANKFORD Flood Zone/Coastal: X500 DOT #: _____

White - Water Supply • Canary - Work • Pink - Owner

Doc No. 40-08/97/02/02

Well 326B

 HYNES & ASSOCIATES		LOG OF BORING MW-2 WELL 326B (Page 1 of 1)															
Delmarva Power Christian Building 252 Chapman Road Newark, Delaware 19714		Project Name : DP&L MW Project Number : JDH-85/330 Start Date : 11/27/96 End Date : 11/27/96	Logged By : P. Venkatesh Driller : M. Hynes Mobile/B-47 Typed By : G. Zacharski Total Depth : 25.8 Feet														
Depth in Feet	MW-2 ELEV.	DESCRIPTION	GRAPHIC	USCS	Samples	Blow/ft	REMARKS										
0		Brown, moist, loose to medium dense, fine to medium SAND, with trace silt and organics		SP	1	7	GROUNDWATER DATA AND NOTES: Groundwater encountered at approximately 9.0 feet below the ground surface during drilling operations 4 inches of organic bearing soil at surface										
					2	12											
5		Dark brown, wet, medium dense, fine to medium SAND		SP	3	16											
10		Brown, saturated, loose, fine to medium SAND, with trace clay		SP	4	5	WELL DATA: <table border="1"> <thead> <tr> <th>Item</th> <th>Depth (ft.)</th> </tr> </thead> <tbody> <tr> <td>Bentonite</td> <td>1.5 to 0</td> </tr> <tr> <td>Sand Pack</td> <td>12 to 13</td> </tr> <tr> <td>Casing</td> <td>15 to -2</td> </tr> <tr> <td>Screen</td> <td>25 to 15</td> </tr> </tbody> </table>	Item	Depth (ft.)	Bentonite	1.5 to 0	Sand Pack	12 to 13	Casing	15 to -2	Screen	25 to 15
Item	Depth (ft.)																
Bentonite	1.5 to 0																
Sand Pack	12 to 13																
Casing	15 to -2																
Screen	25 to 15																
13		Brown, saturated, medium dense, fine to coarse SAND, with little fine gravel		SP	5	19	The 2-inch well is protected by a steel security riser set in concrete pad and is sealed with a locking cap Permit No.: 110243										
15		Light gray, saturated, medium dense, fine to coarse SAND, with little fine gravel and trace silt		SP	6	11											
20		Light gray, saturated, loose, fine to coarse SAND, with little fine gravel		SP	7	10											
25		Boring terminated at 25.5 feet															

12-16-1996 P:\Hynes\DP&L\JDH\mw-2.gal

Baker

LOG OF BORING NO.:

Well 327A

327A

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill

SHEET: 1 OF 4

LATITUDE: LONGITUDE: GEO. DATUM:

START: 9/22/2010 END: 9/28/2010

NORTH: 211,644,390 EAST: 552,890,096 COORD. DATUM: NAD27

LOGGER: Kenneth A. Tusa

STATION: OFFSET: BASELINE:

DRILLER: Paul Wirrick

EQUIPMENT: Geoprobe 7822

DRILL CO. Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler

WATER DEPTH 1: 13.0 TIME: 15:00 DATE: 9/22/2010 DESCRIPTION: First encountered INCLINATION: 0
 WATER DEPTH 2: TIME: DATE: DESCRIPTION: ELEV. DATUM: NAVD88
 WATER DEPTH 3: TIME: DATE: DESCRIPTION: GROUND ELEV.: 13.3

SAMPLE DEPTH (FT.)	SAMPLE TYPE NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. BT (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
0.0						-3		
						-2		
						-1		
						0	SAND; orange and yellow; dry; loose; sand is fine.	0.0' - EL 13.3
	S-1	80%	2			1	SAND; dark brown; dry; loose; sand is fine.	1.0' - EL 12.3
2.0						2		
	A-N					3		
						4		
5.0						5	SAND; tan; dry; loose; sand is fine.	5.0' - EL 8.3
	S-2	62%	3			6		
7.0						7		
	A-N					8		
						9		
10.0						10	SAND; black; dry to moist; loose; sand is fine to medium.	10.0' - EL 3.3
	S-3	75%	3			11		
12.0						12		
	A-N					13		
						14		
15.0						15	SAND; brown; wet; very loose; sand is fine to medium.	15.0' - EL -1.7
	S-4	75%	WOH WOH WOH			16		
17.0						17		

TEMPLATE: BKTCAE FILE: NRC-2010-020 DATE: PRINTED: 10/11/2010 5:04:12 PM

Baker

LOG OF BORING NO.: Well 327A

327A

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill SHEET: 2 OF 4
 LATITUDE: LONGITUDE: GEO. DATUM: START: 9/22/2010 END: 9/28/2010
 NORTH: 211,644,390 EAST: 552,890,096 COORD. DATUM: NAD27 LOGGER: Kenneth A Tua
 STATION: OFFSET: BASELINE: DRILLER: Paul Wirrick
 EQUIPMENT: Geoprobe 7822 DRILL CO.: Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler

WATER DEPTH 1: 13.0 TIME: 15:00 DATE: 9/22/2010 DESCRIPTION: First encountered INCLINATION: 0
 WATER DEPTH 2: TIME: DATE: DESCRIPTION: ELEV. DATUM: NAVD88
 WATER DEPTH 3: TIME: DATE: DESCRIPTION: GROUND ELEV.: 13.3

SAMPLE DEPTH (FT.)	SAMPLE TYPE NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
20.0	A-N					18		
						19		
						20	20.0' - EL -3.7	
	S-5	75%	3			21	SAND, trace gravel, light gray, wet, loose, sand is fine to coarse; gravel is fine.	
22.0						22		
						23		
	A-N					24		
						25		
						26	25.0' - EL -11.7	
	S-6	82%	WCH			27	SAND, light gray, wet, loose, sand is fine to medium.	
27.0						28		
						29		
	A-N					30		
						31	30.0' - EL -16.7	
	S-7	75%	3			32	SAND, trace gravel, light gray, wet, loose, sand is fine to medium; gravel is fine.	
32.0						33		
						34		
	A-N					35		
						36	35.0' - EL -21.7	
	S-8	75%	4			37	SAND, with cobbles, light gray, wet, loose, sand is fine to coarse.	
37.0						38		
	A-N							

TEMPLATE: BKT04E RELEASED: 2010-05-03 DATE PRINTED: 10/20/10 5:04 PM 1259

Baker

LOG OF BORING NO.: Well 32A

327A

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill

SHEET: 3 OF 4

LATITUDE: LONGITUDE: GEO. DATUM:

START: 9/22/2010 END: 9/28/2010

NORTH: 211,644,390 EAST: 552,890,096 COORD. DATUM: NAD27

LOGGER: Kenneth A. Tusa

STATION: OFFSET: BASELINE:

DRILLER: Paul Wirrick

EQUIPMENT: Geoprobe 7822

DRILL CO. Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler

WATER DEPTH 1: 13.0 TIME: 15:00 DATE: 9/22/2010 DESCRIPTION: First encountered INCLINATION: 0
 WATER DEPTH 2: TIME: DATE: DESCRIPTION: ELEV. DATUM: NAVD88
 WATER DEPTH 3: TIME: DATE: DESCRIPTION: GROUND ELEV.: 13.3

SAMPLE DEPTH (FT.)	SAMPLE TYPE NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
40.0						39		
						40	SAND, light gray; wet; loose; sand is fine to medium	40.0' - EL. -26.7'
						41		
						42		
	DR-1	100%				43		
						44		
45.0						45		
						46		
						47		
						48		
						49		
						50		
						51		
						52		
	A-N					53		
						54		
						55		
						56		
						57		
						58		
						59		

TEMPLATE: BKT-AE #1E-MPC-2010-050 DATE PRINTED: 13-SEP-10 14:12:59

LOG OF BORING NO.: **Well 327A****327A**

PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill** SHEET: **4** OF **4**
LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____ START: **9/22/2010** END: **9/28/2010**
NORTH: **211,644,390** EAST: **552,890,096** COORD. DATUM: **NAD27** LOGGER: **Kenneth A Tua**
STATION: _____ OFFSET: _____ BASELINE: _____ DRILLER: **Paul Wirrick**
EQUIPMENT: **Geoprobe 7822** DRILL CO.: **Eichelbergers, Inc.**

METHOD DETAILS: **4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler**

WATER DEPTH 1: **13.0** TIME: **15:00** DATE: **9/22/2010** DESCRIPTION: **First encountered** INCLINATION: **0**
WATER DEPTH 2: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ ELEV. DATUM: **NAVD88**
WATER DEPTH 3: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ GROUND ELEV.: **13.3**

SAMPLE DEPTH (FT.)	SAMPLE TYPE -NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (RQD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
61.0						60		
						61	End of Boring at 61.0 feet.	61.0' - EL -47.7'
						62		
						63		
						64		
						65		
						66		
						67		
						68		
						69		
						70		
						71		
						72		
						73		
						74		
						75		
						76		
						77		
						78		
						79		
						80		

Baker

WELL INSTALLATION LOG NO.: **Well 327A****327A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **1** OF **4**

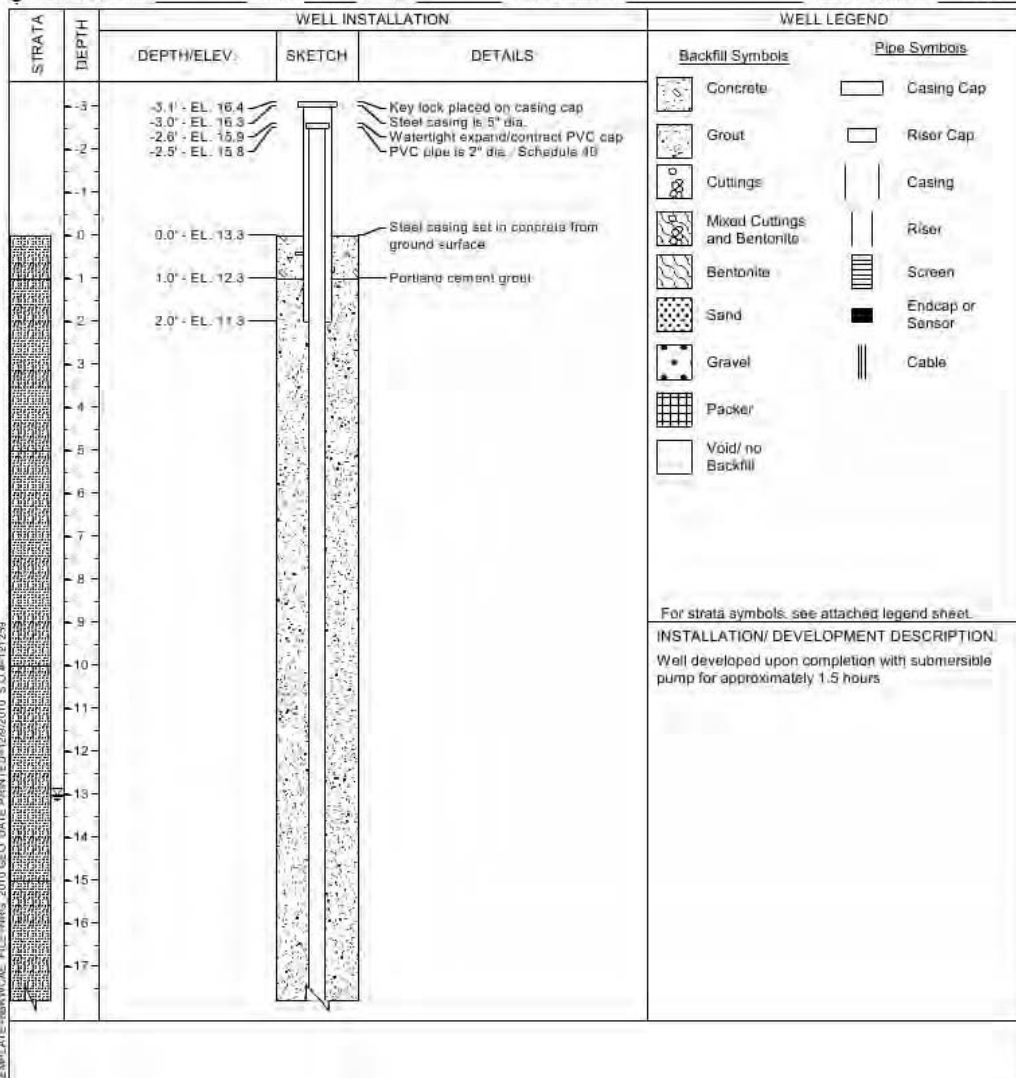
LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/22/2010** END: **9/28/2010**NORTH: **211,644,390** EAST: **552,890,096** COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler**

WATER DEPTH 1:	TIME:	DATE:	DESCRIPTION:	INCLINATION:
13.0	15:00	9/22/2010	First encountered	0
WATER DEPTH 2:	TIME:	DATE:	DESCRIPTION:	ELEV. DATUM:
WATER DEPTH 3:	TIME:	DATE:	DESCRIPTION:	GROUND ELEV.:



Baker

WELL INSTALLATION LOG NO.: **Well 327A****327A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **2** OF **4**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/22/2010** END: **9/28/2010**NORTH: **211,644,390** EAST: **552,890,096** COORD. DATUM: **NAD27**LOGGER: **Kenneth A. Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler**

WATER DEPTH 1: 13.0	TIME: 15:00	DATE: 9/22/2010	DESCRIPTION: First encountered	INCLINATION: 0
WATER DEPTH 2: _____	TIME: _____	DATE: _____	DESCRIPTION: _____	ELEV. DATUM: NAVD88
WATER DEPTH 3: _____	TIME: _____	DATE: _____	DESCRIPTION: _____	GROUND ELEV.: 13.3

STRATA	DEPTH	WELL INSTALLATION		WELL LEGEND	
		DEPTH/ELEV.	SKETCH	DETAILS	
	18				
	19				
	20				
	21				
	22				
	23				
	24				
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
	36				
	37				
	38				

Backfill Symbols		Pipe Symbols	
	Concrete		Casing Cap
	Grout		Riser Cap
	Cuttings		Casing
	Mixed Cuttings and Bentonite		Riser
	Bentonite		Screen
	Sand		Endcap or Sensor
	Gravel		Cable
	Packer		
	Void/ no Backfill		

For strata symbols, see attached legend sheet.

INSTALLATION/ DEVELOPMENT DESCRIPTION:
Well developed upon completion with submersible pump for approximately 1.5 hours

BakerWELL INSTALLATION LOG NO.: **Well 327A****327A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **3** OF **4**

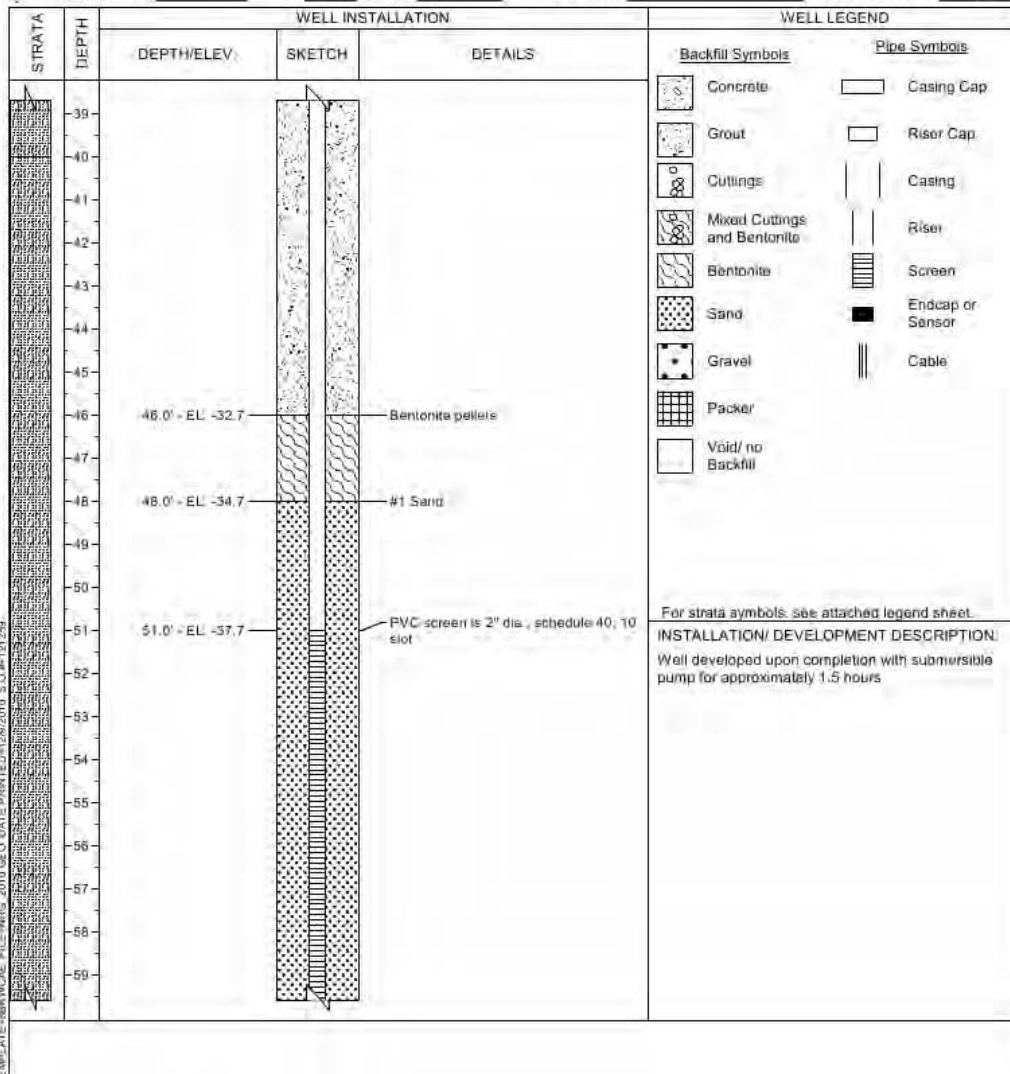
LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/22/2010** END: **9/28/2010**NORTH: **211,644,390** EAST: **552,890,096** COORD. DATUM: **NAD27**LOGGER: **Kenneth A. Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler**

WATER DEPTH 1: 13.0	TIME: 15:00	DATE: 9/22/2010	DESCRIPTION: First encountered	INCLINATION: 0
WATER DEPTH 2: _____	TIME: _____	DATE: _____	DESCRIPTION: _____	ELEV. DATUM: NAVD88
WATER DEPTH 3: _____	TIME: _____	DATE: _____	DESCRIPTION: _____	GROUND ELEV.: 13.3



TEMPLATE: BAKINVOICE FILE: 4/10 2010 GEO DATE PRINTED: 12/6/2010 5:04 PM 15159

Baker

WELL INSTALLATION LOG NO.: **Well 327 A****327A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **4** OF **4**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/22/2010** END: **9/28/2010**NORTH: **211,644,390** EAST: **552,890,096**COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____

BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA 1.375" ID split spoon SPT Auto hammer Direct push sampler**

WATER DEPTH 1:	13.0	TIME:	15:00	DATE:	9/22/2010	DESCRIPTION:	First encountered	INCLINATION:	0°
WATER DEPTH 2:		TIME:		DATE:		DESCRIPTION:		ELEV. DATUM:	NAVD83
WATER DEPTH 3:		TIME:		DATE:		DESCRIPTION:		GROUND ELEV.:	13.3

STRATA	DEPTH	WELL INSTALLATION		WELL LEGEND		
		DEPTH/ELEV.	SKETCH	DETAILS	Backfill Symbols	Pipe Symbols
	-60			Flat bottom, threaded end cap End of Boring at 61.0 feet.	 Concrete	 Casing Cap
	-61	60.9' - EL. -47.6			 Grout	 Riser Cap
	-62				 Cuttings	 Casing
	-63				 Mixed Cuttings and Bentonite	 Riser
	-64				 Bentonite	 Screen
	-65				 Sand	 Endcap or Sensor
	-66				 Gravel	 Cable
	-67				 Packer	
	-68				 Void/ no Backfill	
	-69					
	-70					
	-71					
	-72					
	-73					
	-74					
	-75					
	-76					
	-77					
	-78					
	-79					
	-80					
For strata symbols, see attached legend sheet.						
INSTALLATION/ DEVELOPMENT DESCRIPTION: Well developed upon completion with submersible pump for approximately 1.5 hours						

MAIL TO:

Well 327A

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

http://www.dnrec.state.de.us/

WELL COMPLETION REPORT
MUST BE RETURNED WITHIN 30
DAYS OF CONSTRUCTION. A
WELL FORMATION LOG MUST BE
INCLUDED WITH THIS REPORT.

WELL COMPLETION REPORT

-Authorization Number-

6697614

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 232 746 Local ID: 327A
Tax Map/Parcel #: _____
Property Owner: Indian River Ave LLC
Water Well Contractor: Earthlinkers Inc WC Lic #: 4215
Well Driller in Charge during Construction: Paul Wirrick

WELL CONSTRUCTION METHOD

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify): _____

Total Depth of Excavation: 61'
Construction Date: 9-27-10

CASING INSTALLATION:

INNER CASING

CASING TOP: 2 1/2' above ground
CASING BOTTOM: 51'
CASING DIAMETER: 2"
CASING MATERIAL: PVC

SCREEN INSTALLATION

SCREEN TOP: 51'
SCREEN BOTTOM: 61'
SCREEN DIAMETER: 2"
SCREEN MATERIAL: PVC

OUTER CASING

(1) (2) (3)
CASING TOP: 2 1/2' above ground
CASING BOTTOM: 3 1/2'
CASING DIAMETER: 5"
CASING MATERIAL: steel

SCREEN SLOT SIZE 1010 /THOUSANDSGRAVEL PACK SIZE #1 sand

Gravel Pack From: 61' ft. To: 49' ft.
Grout Type: Portland Cement 1140 Rm ☐ Bentonite Clay
☐ Other: _____ From: 49' ft. To: 0' ft.

Type of Non-Grout backfill of Well Annulus: None
From: 0' To: 0'

Static Water Level: 12' ft. ☒ Below OR ☐ Above Ground Surface
On (date): 9-27-10

Pumping Water Level: _____ ft. On (date): _____
After _____ hrs. Pumping at: _____ GPM

Was a Geophysical Log Taken? ☒ YES ☐ NO

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☒ Pad Mount
☐ Other - Specify: _____

Well Head Completed: 30" inches ☒ Above (OR) ☐ Below Ground Surface

Was the Well Tag attached in accordance with current regulations?

☒ YES ☐ NO If "NO", Please Explain: _____

Site Plan - Include lot size and dimensions, distances from well to house, property lines, nearest road, and all nearby septic systems (include suitable plot plan if available). (If different from original application)

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
ACCURATE AND CORRECT.

Signature - Well Driller in Charge of Well Construction

License # 5348Date 9-27-10

Well 327A

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
100 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST
BE RETURNED WITHIN 30 DAYS OF
CONSTRUCTION DATE

FORMATION LOG

PAGE 1 OF 1 PAGES

PLEASE PRINT OR TYPE - ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PERMIT #: 232-746	LOCAL ID#: 327 A
PROPERTY OWNER: INDIAN RIVER POWER LLC	
WELL CONTRACTOR: Eichelbergers, INC.	WC LIC #: 4218

DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
0'-5' SAND GRAY FINE		
5'-10' SAND + GRAVEL GRAY FINE		
10'-15' SAND + GRAVEL GRAY + WHITE WET + FINE		
15'-20' SAND + GRAVEL WHITE WET + FINE		
20'-25' SAND GRAY + WHITE WET + MEDIUM		
25'-30' SAND + GRAVEL WHITE WET + MEDIUM		
30'-35' SAND WHITE + GRAY WET + FINE		
35'-40' SAND WHITE WET + FINE		
40'-45' SAND GRAY WET + FINE		
45'-50' SAND GRAY WET + MEDIUM		
50'-55' SAND + GRAVEL GRAY WET + MEDIUM		
55'-60' SAND + GRAVEL WHITE WET + FINE		
60'-61' SAND WHITE - WET + FINE		

COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

Paul W. [Signature] 08/08/10
Signature of Well Driller in Charge of Construction

5348
WD License #

9-27-10
Date

White - DNR/EC • Canary - CONTRACTOR • Pink - Owner

Doc No 40-08-82-12-11

Baker

LOG OF BORING NO.: Well 328A

328A

PROJECT: NRG Indian River Power Plant Coal Ash Industrial Landfill SHEET: 1 OF 3
 LATITUDE: LONGITUDE: GEO. DATUM: START: 9/29/2010 END: 9/29/2010
 NORTH: 212,067.637 EAST: 553,017.222 COORD. DATUM: NAD27 LOGGER: Kenneth A Tua
 STATION: OFFSET: BASELINE: DRILLER: Paul Wirrick
 EQUIPMENT: Geoprobe 7822 DRILL CO.: Eichelbergers, Inc.

METHOD DETAILS: 4.0" ID HSA Direct push sampler

WATER DEPTH 1: 9.0 TIME: 8:35 DATE: 9/29/2010 DESCRIPTION: First encountered INCLINATION: 0
 WATER DEPTH 2: TIME: DATE: DESCRIPTION: ELEV. DATUM: NAVD88
 WATER DEPTH 3: TIME: DATE: DESCRIPTION: GROUND ELEV.: 9.05

SAMPLE DEPTH (FT.)	SAMPLE TYPE NUMBER	RECOVERY %	SPT BLOWS/ 0.5 FT. or (RQD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
0.0						-3		
						-2		
						-1		
						0	0.0' - EL 9.1	
						1	SAND; brown and yellow; dry; loose; sand is fine.	
						2	1.3' - EL 7.8	
	DP-1	100%				3	SAND; dark brown; dry; loose; sand is fine.	
						4		
5.0						5	5.0' - EL 4.1	
	DP-2	100%				6	SAND; light brown and brown; wet; medium dense; sand is fine.	
						7		
						8		
10.0						9		
	DP-3	100%				10	10.0' - EL -1.0	
						11	SAND; light brown; wet; dense; sand is fine to coarse.	
						12		
						13		
15.0						14		
						15	15.0' - EL -8.0	
	DP-4	100%				16	SAND; light brown and tan; wet; dense; sand is fine to coarse.	
						17		

Baker

LOG OF BORING NO.: **Well 328A****328A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **2** OF **3**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/29/2010** END: **9/29/2010**NORTH: **212,067.637** EAST: **553,017.222** COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1	9.0	TIME: 8:35	DATE: 9/29/2010	DESCRIPTION: First encountered	INCLINATION: 0
WATER DEPTH 2		TIME: _____	DATE: _____	DESCRIPTION: _____	ELEV. DATUM: NAVD88
WATER DEPTH 3		TIME: _____	DATE: _____	DESCRIPTION: _____	GROUND ELEV: 9.05

SAMPLE DEPTH (FT.)	SAMPLE TYPE NUMBER	RECOVERY %	SPT BLOWS/0.5 FT. or (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
20.0	DP-5	100%				18 19 20 21 22 23 24	20.0' - EL -11.0 SAND, light gray, wet, medium dense, sand is fine to medium. 21.0' - EL -12.0 SAND, trace gravel, light brown, wet, medium dense, sand is fine to coarse, gravel is fine.	
25.0	DP-6	100%				25 26 27 28 29	25.0' - EL -16.0 SAND AND GRAVEL, light gray, wet, medium dense, sand is fine to coarse, gravel is fine.	
30.0	DP-7	100%				30 31 32 33 34		
35.0	DP-8	100%				35 36 37 38	35.0' - EL -26.0 SAND, (trace gravel), brown, wet, medium dense, sand is fine to coarse, gravel is fine. 38.0' - EL -29.0 SAND AND GRAVEL, gray, wet, medium dense, sand is	

TEMPLATE: BKT-24-RE-04-01-2010-050 DATE PRINTED: 12/09/10 5:04 PM 12/29/10

Baker

LOG OF BORING NO.: **Well 328A****328A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **3** OF **3**

LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/29/2010** END: **9/29/2010**NORTH: **212,067.637** EAST: **553,017.222** COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1	9.0	TIME	8:35	DATE	9/29/2010	DESCRIPTION	First encountered	INCLINATION	0
WATER DEPTH 2		TIME		DATE		DESCRIPTION		ELEV. DATUM	NAVD88
WATER DEPTH 3		TIME		DATE		DESCRIPTION		GROUND ELEV.	9.05

SAMPLE DEPTH (FT.)	SAMPLE TYPE - NUMBER	RECOVERY %	SPT BLOWS/0.5 FT. or (ROD)	TEST RESULTS	STRATA	DEPTH	DESCRIPTION	REMARKS
40.0						-39	fine to coarse; gravel is fine.	
						-40	40.0' - EL -31.0	
						-41	SAND, trace gravel, brown wet; medium dense; sand is fine to coarse; gravel is fine.	
	DP-9	100%				-42	42.0' - EL -34.0	
						-43	SAND AND GRAVEL, gray wet; medium dense; sand is fine to coarse; gravel is fine.	
45.0						-44		
						-45	45.0' - EL -36.0	
	DP-10	100%				-46	SAND, brown wet; medium dense; sand is fine to coarse.	
						-47		
						-48		
50.0						-49		
						-50		
	DP-11	100%				-51		
						-52		
						-53		
55.0						-54		
						-55		
	A-N					-56		
58.0						-57		
						-58	58.0' - EL -49.0	
						-59	End of Boring at 58.0 feet.	

TEMPLATE: BAKT/CAL FILEWING 3/01/00 DATE PRINTED: 15/NOV/10 5:04:12 PM

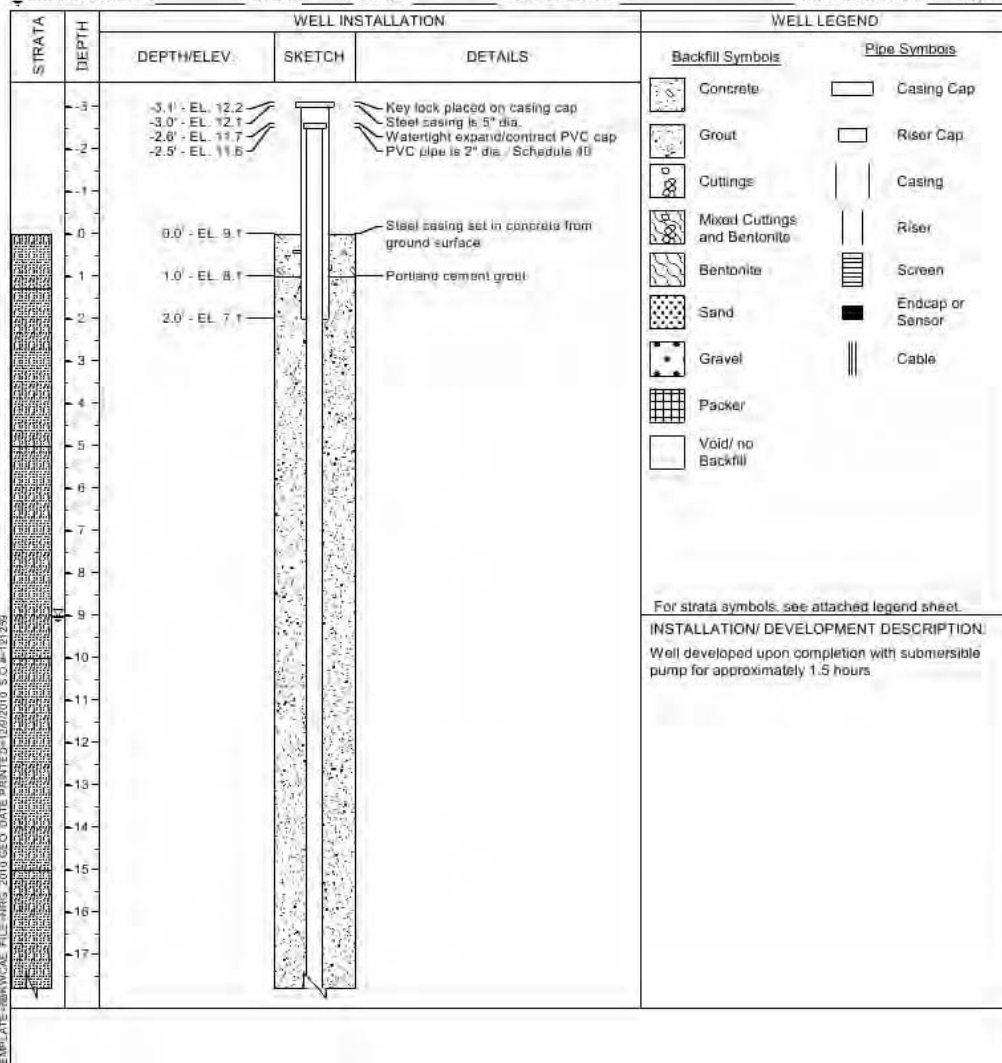
Baker

WELL INSTALLATION LOG NO.: **Well 328A****328A**

PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill** SHEET: **1** OF **3**
 LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____ START: **9/29/2010** END: **9/29/2010**
 NORTH: **212,067.637** EAST: **553,017.222** COORD. DATUM: **NAD27** LOGGER: **Kenneth A Tua**
 STATION: _____ OFFSET: _____ BASELINE: _____ DRILLER: **Paul Wirrick**
 EQUIPMENT: **Geoprobe 7822** DRILL CO.: **Eichelbergers, Inc.**

METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1: **9.0** TIME: **8:35** DATE: **9/29/2010** DESCRIPTION: **First encountered** INCLINATION: **0**
 WATER DEPTH 2: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ ELEV. DATUM: **NAVD88**
 WATER DEPTH 3: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ GROUND ELEV.: **9.05**



TEMPLATE: BAKWV01E FILE: NRG 3110 GEO DATE PRINTED: 10/29/2010 5:04 PM 10/29/2010



TEMPLATE:RWKCAE FILE:JRG 2010 GEO DATE PRINTED=12/9/2010 5:04:12:259

WELL INSTALLATION LOG NO.: **Well 328A****328A**PROJECT: **NRG Indian River Power Plant Coal Ash Industrial Landfill**SHEET: **3** OF **3**

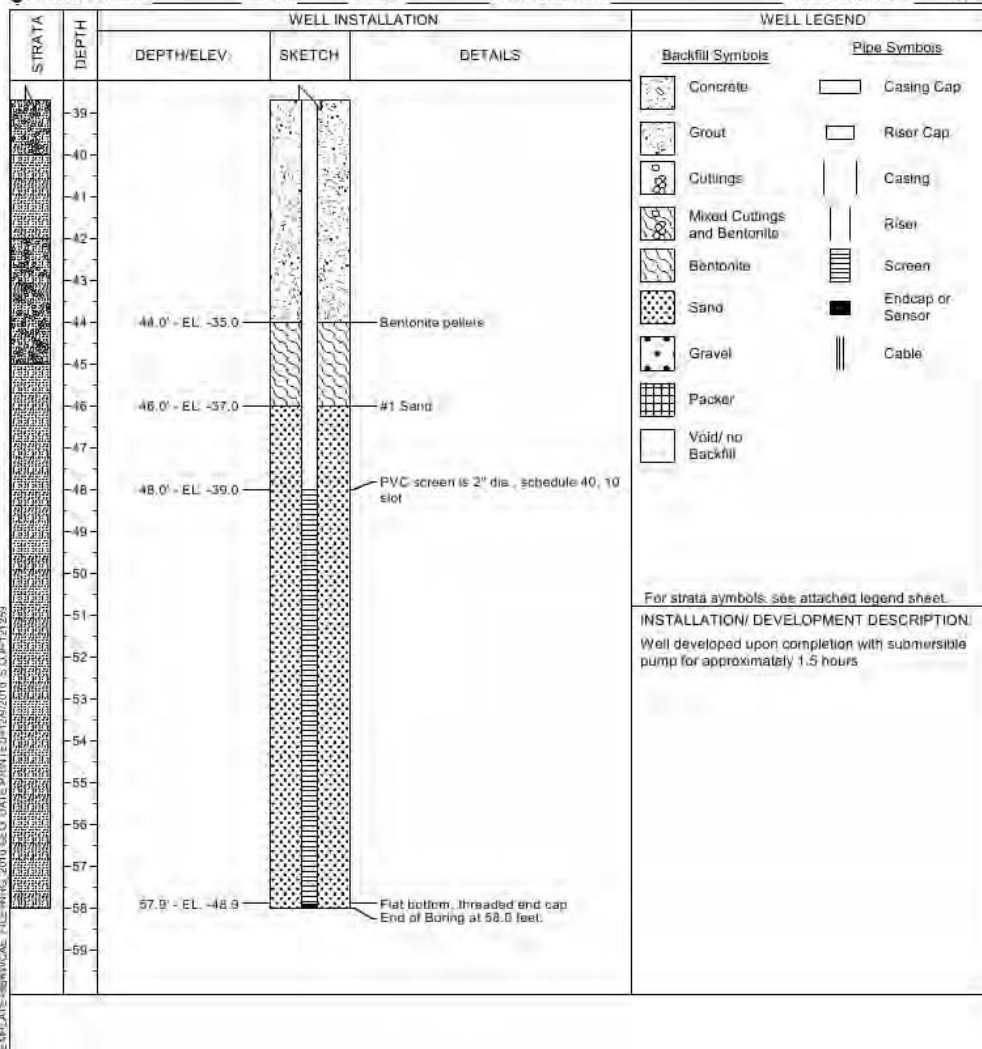
LATITUDE: _____ LONGITUDE: _____ GEO. DATUM: _____

START: **9/29/2010** END: **9/29/2010**NORTH: **212,067.637** EAST: **553,017.222** COORD. DATUM: **NAD27**LOGGER: **Kenneth A Tua**

STATION: _____ OFFSET: _____ BASELINE: _____

DRILLER: **Paul Wirrick**EQUIPMENT: **Geoprobe 7822**DRILL CO.: **Eichelbergers, Inc.**METHOD DETAILS: **4.0" ID HSA Direct push sampler**

WATER DEPTH 1: **9.0** TIME: **8:35** DATE: **9/29/2010** DESCRIPTION: **First encountered** INCLINATION: **0**
WATER DEPTH 2: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ ELEV. DATUM: **NAVD85**
WATER DEPTH 3: _____ TIME: _____ DATE: _____ DESCRIPTION: _____ GROUND ELEV.: **9.05**



MAIL TO: **Well 328A**

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

<http://www.dnrec.state.de.us/>

WELL COMPLETION REPORT
MUST BE RETURNED WITHIN 30
DAYS OF CONSTRUCTION. A
WELL FORMATION LOG MUST BE
INCLUDED WITH THIS REPORT.

WELL COMPLETION REPORT

-Authorization Number-

6697614

ILLEGIBLE OR INCOMPLETE FORMS WILL BE RETURNED

PLEASE PRINT OR TYPE - USE BLUE OR BLACK INK ONLY

Permit #: 232747 Local ID: 328 A
Tax Map/Parcel #: _____
Property Owner: Indian River Park LLC
Water Well Contractor: Earthloggers Inc WC Lic #: 4218
Well Driller in Charge during Construction: Paul Winkler

WELL CONSTRUCTION METHOD

☒ Augered ☐ Bored ☐ Cable Tool
☐ Driven ☐ Jetted ☐ Air Rotary
☐ Mud Rotary ☐ Reverse ☐ Washed
☐ Other (Specify): _____
Total Depth of Excavation: 58'
Construction Date: 9-29-10

CASING INSTALLATION:

INNER CASING

CASING TOP: 2 1/2' above ground
CASING BOTTOM: 48"
CASING DIAMETER: 2"
CASING MATERIAL: PVC

SCREEN INSTALLATION

SCREEN TOP: 48"
SCREEN BOTTOM: 58"
SCREEN DIAMETER: 2"
SCREEN MATERIAL: PVC

OUTER CASING

(1) (2) (3)
CASING TOP: 2 1/2' above ground
CASING BOTTOM: 2 1/2'
CASING DIAMETER: 5"
CASING MATERIAL: Steel

SCREEN SLOT SIZE: .010 /THOUSANDS

GRAVEL PACK SIZE: #1 sand

Gravel Pack From: 58' ft. To: 46' ft.
Grout Type: Retard ☐ Cement White Port ☐ Bentonite Clay
☐ Other: _____ From: 46' ft. To: 0' ft.
Type of Non-Grout backfill of Well Annulus: NONE
From: N/A To: N/A
Static Water Level: 9 ft. ☐ Below OR ☐ Above Ground Surface
On (date): 9-29-10
Pumping Water Level: _____ ft. On (date): _____
After: _____ hrs. Pumping at: _____ GPM
Was a Geophysical Log Taken? ☒ YES ☐ NO

WELL HEAD COMPLETION:

Type: ☐ Pitless Adapter ☐ Standard "T"
☐ Well Pit ☒ Pad Mount
☐ Other - Specify: _____

Well Head Completed: 31" inches ☒ Above (OR) ☐ Below Ground Surface
Was the Well Tag attached in accordance with current regulations?
☒ YES ☐ NO If "NO", Please Explain: _____

Site Plan - Include lot size and dimensions, distances from well to house, property lines, nearest road, and all nearby septic systems (include suitable plot plan if available). (If different from original application)

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS
ACCURATE AND CORRECT.

Paul Winkler DS10051
Signature - Well Driller in Charge of Well Construction
5348 9-29-10
License # Date

Well 328A

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-9944
FAX: 302-739-7764

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

WELL COMPLETION REPORT MUST
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CONSTRUCTION DATE.

FORMATION LOG

PAGE 1 OF 1 PAGES

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PERMIT #: 232747	LOCAL ID#: 328-A
PROPERTY OWNER: Indian River Power LLC	
WELL CONTRACTOR: Eichelbergers INC	WC LIC #: 4218

DESCRIPTION	TOP OF STRATA	BOTTOM OF STRATA
0'-5' SAND BLACK VERY FINE		
5'-10' SAND BLACK TO ORANGE FINE WET		
10'-15' SAND + GRAVEL ORANGE TO BROWN FINE WET		
15'-20' SAND BROWN TO WHITE MEDIUM WET		
20'-25' SAND WHITE + GRAY MEDIUM WET		
25'-30' SAND WHITE FINE + WET		
30'-35' SAND + GRAVEL WHITE + GRAY WET + FINE		
35'-40' SAND GRAY WET + FINE		
40'-45' SAND + GRAVEL GRAY TO WHITE FINE WET		
45'-50' SAND WHITE MEDIUM + WET		
50'-55' SAND + GRAVEL FINE WET		
55'-58' SAND WHITE FINE WET		

COMMENTS:

I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

Paul W. Jurek DS/O-081

Signature of Well Driller in Charge of Construction

5348

WD License #

9-29-10

Date

White - DNREC * Canary - CONTRACTOR * Pink - Owner

Doc No. 40-08-32-12-11