



OVER 100 YEARS OF SUPERIOR SERVICE

Artesian Water Company



Artesian Wastewater Management



Artesian Utility Development



Artesian Water Pennsylvania



Artesian Water Maryland



Artesian Wastewater Maryland

March 19, 2025

Mr. John Rebar
DNREC – Division of Water - CGSS
89 Kings Highway
Dover, DE 19901

Re: Llangollen ASR Well
UIC Permit No. 5R21-01-04N (Amendment 2)
Permit Renewal Application

Dear Mr. Rebar:

Please find the application for renewal of the Llangollen ASR Underground Injection Control (UIC) Permit referenced above. Artesian is not requesting any changes from the existing permit at this time.

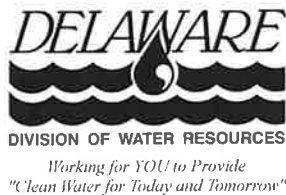
If you have any questions regarding this application, please contact me at (302) 453-6935 or bprice@artesianwater.com.

Very truly yours,

Barry Price
Operations Technical Director

cc: John Thader

DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC)



Groundwater Discharges Section (UIC Program)

89 Kings Hwy, Dover, DE 19901

(302) 739-9948

Underground Injection Control (UIC) Class V Well Application Form

Please note that the Tank Management Section (TMS) and Groundwater Discharges Section (GWDS) are in different DNREC Divisions and different offices. Therefore, contacting the TMS is not the same as contacting the GWDS and vice versa.

Note: Information that has been previously submitted to another DNREC Division, Section or Branch, other than the Groundwater Discharges Section (GWDS), is not considered part of this application.

The Secretary shall not issue a permit before receiving a complete application for a permit. An application for a permit is complete when the Director receives an application form and any supplemental information which are completed to his or her satisfaction. The completeness of any application for a permit shall be judged independently of the status of any other permit application or permit for the same facility or activity. [40 CFR §144.31]

All information provided shall be considered public information and shall be considered part of the public record pertaining to the permit application. If the applicant can demonstrate that information provided is not a matter of public record at the time of the application, and that the release of such information to the public would constitute an invasion of personal privacy or would seriously affect the applicant's business or competitive situation, the Department may designate such information as confidential information. [7 Del. C §7903]

Any underground injection, except into a well authorized by rule or except as authorized by permit issued under the UIC program, is prohibited. The construction of any well required to have a [UIC] permit is prohibited until the [UIC] permit has been issued. [40 CFR §144.11]

Instructions: All applicable items must be completed in order to avoid delay in processing this application. Where attached sheets or other technical documentation are utilized in lieu of filling in the blank spaces on this form, please provide a cross reference in the blank spaces and identify each attachment by item number. Only original signatures are acceptable. When possible, please submit your application and associated paperwork on double-sided paper.

If you will need to re-inject at this site, please contact the GWDS prior to completing a new UIC application.

**DELAWARE DEPARTMENT OF
NATURAL RESOURCES AND ENVIRONMENTAL CONTROL**
Underground Injection Control (UIC) Class V Well Application Form

If each well is identical, you may complete one application, to cover all wells

Number of identical wells:

Application Date: 3/19/2025

A. APPLICANT

- The applicant is the person applying for the UIC approval; this is the person who will sign the application and any reports; the address/phone number is for the applicant

Applicant Name: John Thaeder

Company Name: Artesian Water Company, Inc.

Address: 664 Churchmans Road

City: Newark , County: New Castle , State: DE

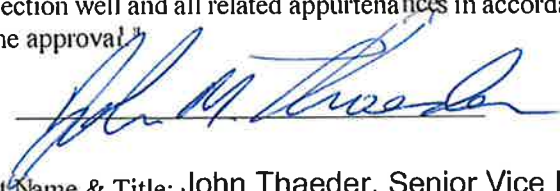
Zip code: 19702

Telephone: 302-453-6900 Fax: 302-453-5800

In accordance with 40 CFR §144.32, all applications shall be signed by an authorized official, and shall include the following certification statement:

"I hereby certify, under penalty of law, that I have personally examined and am familiar with the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining said information, I believe that the information is true, accurate and complete. I am aware that there are significant penalties, including the possibility of fines and imprisonment, for submitting false information. I agree to construct, operate, maintain, repair, and I agree to, applicable, abandon the injection well and all related appurtenances in accordance with the approved specifications and conditions of the approval."

Signature:



Print Applicant Name & Title: John Thaeder, Senior Vice President of Operations

B. PROPERTY OWNER (if different from applicant)

- If the applicant is not the property owner, the property owner must sign this page; if you need to send this page to the property owner, you may submit this page separately (resulting in submitting two (2) copies of this page – one with a signature and one without)

Name:

Address:

City: , County: , State:

Zip code:

Telephone:

CONSENT OF PROPERTY OWNER

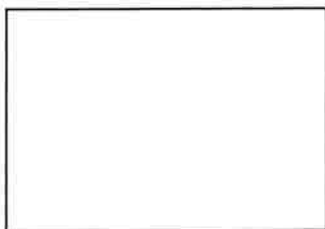
If the property is owned by someone other than the applicant, the property owner hereby consents to allow the applicant to construct each injection well as outlined in this application and that it shall be the responsibility of the applicant to ensure that each injection well conforms to the Well Construction Standards.

Signature of Property Owner if Different from Applicant _____

Print Owner Name & Title:

C. DELAWARE-REGISTERED PROFESSIONAL ENGINEER/GEOLOGIST (Optional)

"I certify that the features of this injection point have been designed or examined by me and found to be in conformity with modern principles of injection of fluids and well design for the purpose described in this application. There is reasonable assurance, in my professional judgment, that the injection point, when properly maintained and operated, will discharge the fluid in compliance with all applicable statutes of the State of Delaware and the rules of the Department of Natural Resources and Environmental Control. It is agreed that the undersigned will furnish the applicant with a set of instructions for proper maintenance and operation of the injection point."



(seal)

Signature: _____

Print Name & Title:

Company name:

Mailing address:

DE Registration number: _____ Issue date: _____ Expiration date: _____

D. STATUS OF APPLICANT

Federal ☐ State ☐ Private ☒ Native American Lands ☐
Public ☐ Commercial ☐ Other (please specify) ☐ -

E. FACILITY (SITE) DATA

- All of the requested information is required; when describing the activities which require UIC approval, one example may be: "leaking USTs were found in area of

former gas dispensing equipment"

Name of Business or Facility: **Artesian Water Company, Inc.**

Address: **1110 River Road**

City: **New Castle** , County: **New Castle** , State: **DE**

Zip code: **19720**

Telephone: **302-453-6900** Fax: **302-453-5800**

Contact Person (name & title): **Barry Price, Operations Team**

Tax Map number: **10-041.20-015**

4-digit SIC code (up to 4 codes): , , ,

Is business currently in operation or have operations ceased? If still in operation, provide current business name. **Artesian Water Company**

Please provide a description of the activities conducted by the applicant which require a UIC permit or Authorization. Please also include the event(s) which led to the need for remediation, if applicable:

Renewal of UIC permit for the recharge of potable water to the Potomac Aquifer.

Please mark in the appropriate box a listing of all permits or construction approvals received or applied for under any of the following programs:

- ☐ Hazardous Waste Management program under RCRA.
- ☒ UIC program under SDWA.
- ☐ NPDES program under CWA.
- ☐ Prevention of Significant Deterioration (PSD) program under the Clean Air Act.
- ☐ Nonattainment program under the Clean Air Act.
- ☐ National Emission Standards for Hazardous Pollutants (NESHAP) preconstruction approval under the Clean Air Act.
- ☐ Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.
- ☐ Dredge and fill permits under section 404 of CWA.
- ☒ Other relevant environmental permits, including State permits. Explain:
Water allocation Permit 95-0004M for the recovery of injected water.

F. INJECTION PROCEDURE (Briefly describe the injection method, how the injection point(s) will be used, including quantities per injection point, and the expected duration of injection activities.)

See attached injection procedure.

G. PROJECT DESCRIPTION

- 1) Description and Use of Facility; include a brief description of the nature of the business
This is an ongoing Aquifer Storage and Recovery project for the recharge and recovery of potable water to meet peak demands for Artesian Water Company, an investor owned water utility.
- 2) Description of Injectate (include MSDS sheet(s), for each constituent of the injectate)
The injectate is potable water.
- 3) Treatment of Injectate prior to Injection (including mixing ratios)
The injectate is potable water, which requires no further treatment.
- 4) Description of any withdrawn/recovered fluid, including destination of withdrawn fluid.
Withdrawn potable water will be used to meet peak demand in Artesian's public water system. The well will be periodically backflushed overboard to remove accumulated particulate matter from the well screen.
- 5) Please attach any approval letters from any DNREC Division (including the Tank Management Section (TMS) or the Site Investigation and Restoration Branch (SIRB)), in relation to the injection activities.

H. CONSTRUCTION DATA (check one)

The construction of any well required to have a [UIC] permit is prohibited until the [UIC] permit has been issued. [40 CFR §144.11]

- Select the appropriate box, for well type; note that you must have UIC approval prior to applying for a well permit; when applying for a well permit, please note the UIC Permit or UIC Authorization number associated with your project; if any of the questions are not applicable to your injection well (such as casing extending above ground level), just enter "N/A"

- ☐ **EXISTING INJECTION WELL** to be modified. Provide the data in (1) through (6) below as *PROPOSED* construction specifications. You may be required to submit a copy of the completion report.
- ☒ **EXISTING WELL** being proposed for use as an injection well. Provide the data in (1) through (6) below to the best of your knowledge. You may be required to submit a copy of the well permit and completion report.
- ☐ **PROPOSED WELL** to be constructed for use as an injection well. Provide the data in (1) through (6) below as *PROPOSED* construction specifications. You may be required to submit a copy of the completion report after construction.

If each well is identical, you may complete one application, to cover all wells

Number of *identical* wells: 1

Well permit number(s) (if existing wells): 156408 , ,

NOTE: The well drilling contractor can supply the data for either existing or proposed well if this information is unavailable by other means.

- (1) Well drilling Contractor's Name: Layne Christensen
Drillers License Number: 1581
- (2) Date to be constructed: 1/17/20 (M/D/YYYY)
Approximate depth: 165 ft
- (3) Well casing:
(a) Type: Galvanized steel ☐ Black steel ☒ Plastic ☐
Other (specify) ☐ -
(b) Inside diameter: 14 inches;
Wall thickness 0.375 inches or Schedule #
(c) Casing depth: From +2 to -130 ft. (reference to land surface)
(d) Casing extending above ground 24 inches
- (4) Grout Seal:
(a) Around inner or "primary" casing: From to ft. (from the land surface to the point of injection)
(b) Around outer (pit) casing, if present: From 0 to 128 ft.
(c) Type Cement
- (5) Screens (if applicable):
(a) Type: SS ; Inner diameter 14 inches
(b) Depth: From 130 to 160 feet below land surface
- (6) Gravel (if applicable): From 90 to 165 feet below land surface

I. PROPOSED OPERATING DATA

- (1) Injection rate: Maximum (daily) **750** gallons per minute (gpm)
Average (daily) **350** gallons per minute (gpm)
How will the rate be measured? **Totalizing flow meter.**
- (2) Injection volume: Maximum **750** gallons per minute (gpm)
Average **350** gallons per minute (gpm)
How will the volume be measured? **Totalizing flow meter.**
 - if you have a finite amount of injectate (for example, you have X buckets of ORC powder), state that in the box asking how the volume will be measured
- (3) Total quantity of each injected material (include units): **130** , MG Per Year
, and
- (4) Injection pressure: Maximum **25** pounds/square inch (psi)
Average **15** pounds/square inch (psi)
How will the pressure be measured? **gauge**
- (5) Depth to injection area: **130** feet
- (6) Expected lifetime of *injection* activities: **8** months **per year**
- (7) Anticipated start date: **Ongoing**
- (8) Estimated radius of influence of injectate: **750** feet

J. INJECTION-RELATED EQUIPMENT

Attach a diagram showing the layout of the (i) injection equipment, (ii) exterior piping/tubing associated with the injection operation, and (iii) the proposed injection points. A hand-written drawing is fine; it does not need to be to scale. The map of proposed injection points should show all points, even if they are off of the site/property boundaries.

K. TOPOGRAPHIC MAP

Attach a scaled, color topographic map extending 500 feet beyond the property boundaries of the source (not to exceed one (1) mile), depicting the facility and the following: the facility's intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; and each well where fluids from the facility are injected underground. Also include those wells, springs, and other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within a 500 ft radius of the injection area. The map should be clear enough to read the contour lines.

L. AREA OF REVIEW

Attach a detailed, scaled color map of the site of the facility, showing the location of and distances between the proposed well(s) (source wells and injection wells) and any waste (including hazardous waste) treatment, storage or disposal facilities; buildings; property boundaries; surface water bodies; and any other potential source of groundwater contamination. Additionally, indicate on the map the direction and distance to existing wells (injection wells, water supply wells) located within 500 feet of the proposed injection well(s). Include with the map a description of each existing well incorporating type, construction information, date drilled, and depth. Indicate on the map at least two nearby reference points such as roads, road intersections, streams, etc., and identify them by numbers or name. Label all features clearly. Include a north arrow on the map to indicate orientation. If there are none of the above-referenced features within a 500 ft radius, a statement shall be noted on the map.

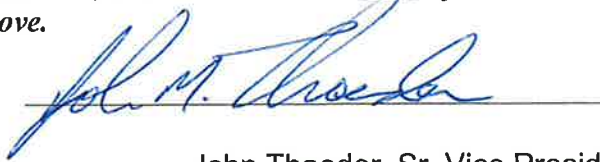
The map shall include a drawing indicating the plume of contamination (including the entire boundary of the contamination), groundwater flow and the direction of movement of the injected fluid (*this may be shown on any submitted map*). If you are submitting multiple maps (for multiple plumes), each map must show the boundary of the plume of contamination, direction of groundwater flow and the direction of movement of the injected fluid.

M. ABANDONMENT PLAN

Plugging and abandonment. Any Class I permit shall include, and any Class V permit or Authorization may include, conditions to ensure that plugging and abandonment of the well will not allow the movement of fluids either into an underground source of drinking water or from one underground source of drinking water to another. For purposes of this paragraph, temporary, intermittent cessation of injection operations is not abandonment. Abandonment (closure) of the injection points shall be completed in accordance with the State of Delaware "**Regulations Governing Underground Injection Controls**" and the "**Regulations Governing the Construction and Use of Wells**." The abandonment shall be performed by or under the direct on-site supervision of an individual licensed pursuant to the requirements of 7 Del. C. §6023 and the requirements of the "**Regulations Governing the Construction and Use of Wells**." Certification of injection well abandonment by a duly authorized individual shall be submitted to the GWDS within 30 days of completion.

I certify that upon cessation of injection activities, all injection points shall be properly abandoned, in accordance with State of Delaware laws and regulations, as described above.

Signature:



Print Applicant Name & Title: John Thader, Sr. Vice President of Operations

Please return the completed application package to:

DNREC - Division of Water - CGSS
89 Kings Highway
Dover, DE 19901
Telephone: 302-739-9948
Email: john.rebar@delaware.gov

When possible, please submit your application and associated paperwork on double-sided paper.

Artesian Water Company, Inc.
Llangollen Aquifer Storage and Recovery Well
Attachments to UIC Permit Renewal Application
March 19, 2025

- I. Injection Procedure (application section F)
- II. Well Permit and Completion Report (application section H)
- III. Injection Related Equipment (application section J)
- IV. Topographic Map (application section K)
- V. Area of Review (application section L)

Attachment I

Injection Procedure (Permit Section F)

The annual recharge cycle will begin each year approximately in October, and continue until approximately May. Injection of potable water from Artesian's water system to the well occurs through the use of two 3-inch diameter stainless steel drop pipes that extend below the static water level. The maximum injection flow rate is 750 gpm. The injection flow rate is controlled by an automatic flow control valve, and is measured by a magnetic flow meter.

Annual recovery of the stored water will begin each year approximately in June, and continue until approximately September. Recovery is accomplished using an existing vertical turbine pump. The maximum recovery flow rate is 1000 gpm. The flow rate is maintained using a variable frequency drive, and is measured by a magnetic flow meter.

In addition to injection and recovery flow rates mentioned above, well water level, system pressure, pH, Chlorine, Fluoride and Conductivity are monitored continuously. All instrumentation is connected to an automated control system, which communicates to Artesian's system wide Supervisory Control and Data Acquisition system. All continuously monitored data is recorded at a 15-minute interval.

Attachment II

Well Permit and Completion Report (Permit Section H)

MAIL TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-3665
FAX: 302-739-2296

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

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

WELL COMPLETION REPORT

PAGE 1 OF 2 PAGES

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

| | | |
|--|----------------------------------|---|
| PERMIT NO. <u>156408-W</u> | LOCAL ID <u>Llangollen</u> | WELL CONSTRUCTION METHOD |
| TAX MAP # _____ | | <input type="checkbox"/> AUGERED <input type="checkbox"/> BORED <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> DRIVEN <input type="checkbox"/> JETTED <input type="checkbox"/> AIR ROTARY <input type="checkbox"/> MUD ROTARY <input checked="" type="checkbox"/> REVERSE <input type="checkbox"/> WASHED <input type="checkbox"/> OTHER _____ (Specify) |
| PROPERTY OWNER <u>Artesian Water Company</u> | | TOTAL DEPTH OF EXCAVATION: <u>167'</u> |
| WELL CONTRACTOR <u>Layne Christensen Company</u> | | |
| LIC# <u>1057</u> | CONSTRUCTION DATE <u>1/17/03</u> | |

| CASING INSTALLATION | | OUTER CASING |
|---------------------|-------------------------|--------------|
| INNER CASING(S) | | |
| CASING TOP | <u>+ 2</u> <u>G.L.</u> | <u>+ 2</u> |
| CASING BOTTOM | <u>90'</u> <u>128'</u> | <u>12"</u> |
| CASING DIAMETER | <u>24"</u> <u>20"</u> | <u>30"</u> |
| CASING MATERIAL | <u>Iron</u> <u>Iron</u> | <u>Iron</u> |

| SCREEN INSTALLATION | |
|---------------------|------------------|
| INNER CASING(S) | |
| SCREEN TOP | <u>129'</u> |
| SCREEN BOTTOM | <u>160'</u> |
| SCREEN DIAMETER | <u>14"</u> |
| SCREEN MATERIAL | <u>Stainless</u> |

| | |
|--|--|
| GRAVEL PACK FROM <u>166</u> TO <u>90</u> FEET | TYPE OF PERMANENT PUMP INSTALLED: |
| GROUT TYPE: <input checked="" type="checkbox"/> CEMENT (c) <input type="checkbox"/> BENTONITE CLAY (b) | PUMP MANUFACTURE <u>Byron Jackson</u> |
| OTHER (o) _____ | RATED CAPACITY (GPM) <u>1000</u> |
| FROM <u>6</u> (ft) TO <u>128'</u> FROM _____ (ft) TO _____ FEET | PUMP INTAKE SETTING <u>89'</u> FT. BELOW GRADE <u>G.L.</u> |
| NON-GROUT BACKFILL OF WELL ANNULUS | THE LOCATION AND CONSTRUCTION OF THIS WELL IS IN COMPLIANCE WITH ALL PERMIT CONDITIONS AND WITH ALL APPLICABLE WELL CONSTRUCTION REGULATIONS. <input type="checkbox"/> YES <input type="checkbox"/> NO |
| TYPE _____ FROM _____ TO _____ | If "no," attach a copy of the approved well permit which has the revised location clearly marked. |
| STATIC WATER LEVEL OF (DATE) <u>48'</u> <u>1/17/03</u> | NOTE: Completed Formation Log must be attached. |
| _____ FT. (Below, Above) GROUND SURFACE | COMMENTS: <u>Redrill</u> |
| PUMPING WATER LEVEL OF (DATE) <u>81'</u> | |
| AFTER <u>8</u> HOURS AT <u>841</u> GPM. | |
| WAS A GEOPHYSICAL LOG TAKEN? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | |
| WELL HEAD COMPLETION: | |
| TYPE: <input type="checkbox"/> PITLESS ADAPTER <input type="checkbox"/> STANDARD "T" <input type="checkbox"/> WELL PIT <input type="checkbox"/> PAD MOUNT <input type="checkbox"/> OTHER _____ | I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT. |
| _____ INCHES ABOVE GRADE | <u>1/17/03</u> |
| AS THE WELL TAG ATTACHED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | Signature of Well Driller in Charge |
| IF "NO", EXPLAIN _____ | <u>1581</u> |
| | License# _____ Date _____ |

PERMIT NO.

**WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
89 KINGS HIGHWAY
DOVER, DELAWARE 19901
PHONE: 302-739-3665
FAX: 302-739-2296**

FORMATION LOG

PAGE 2 OF 2 PAGES

[illegible]

HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT

Signature of Well Driller In Charge

License#

Date _____

White - DNREC • Canary - Contractor • Pink - Owner

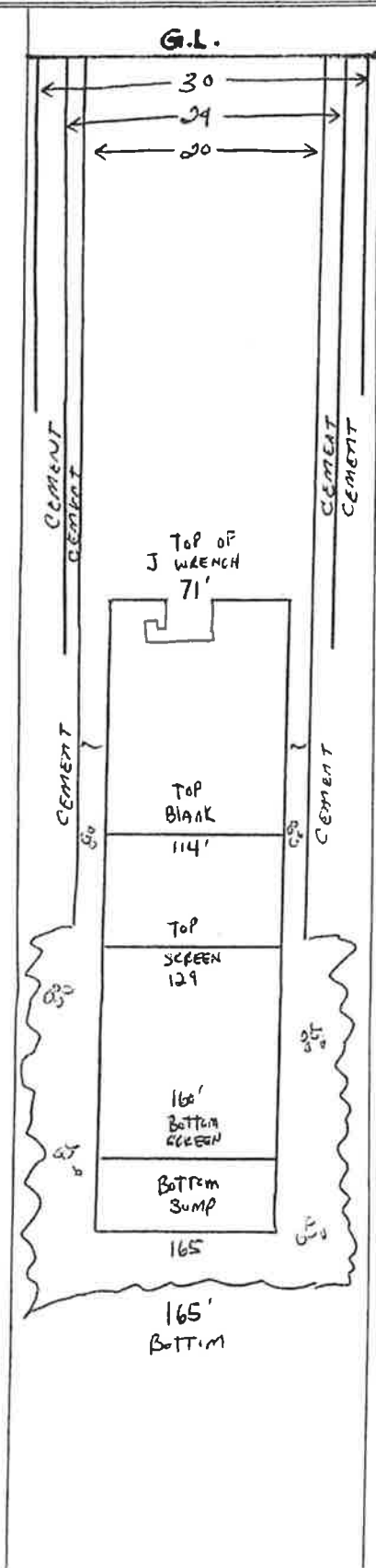
Doc. No. 40-08-82-12-11



1250 WEST ELIZABETH AVE., LINDEN, N. J.

DRILLERS REPORT

CL. OMER ARTESIAN WATER DRILLER ASC # 7 CUSTOMER WELL No.
WELL LOCATION Llangollen - RT 9 LAYNE WELL No.
STATE PERMIT No. 156408
FORMATION SKETCH OF SETTING REMARKS



PIPE SET:

| DIA. | WALL | LGTH. | MATL. | T & C (OR) WELDED |
|------|------|--------|-----------|-------------------|
| 14" | .375 | 43' 4" | STEEL | WELDED |
| 14" | .375 | 5' | STAINLESS | WELDED |
| 14" | .375 | 15' | STAINLESS | WELDED |

PIPE LEFT IN PLACE:

| DIA. | WALL | LGTH. | MATL. | T & C (OR) WELDED |
|------|------|-------|-------|-------------------|
| 30" | .375 | | | |
| 24" | .375 | 90' | STEEL | WELDED |
| 20" | .375 | 120' | STEEL | WELDED |

SCREEN:

NOM. SIZE 14" I.D. LGTH. 30' OPNO. - 065
MFG. Johnson TYPE WIRE METAL STAINLESS GA. No.
SET IN FORMATION
WELL UNDERREAMED TO 30" DIAMETER

MISCELLANEOUS:

R & L BACK OFF CUT OFF PACKER TYPE

CONE:

DIA. TOP DIA. BOTT. LGTH. MTL.

PLUG:

DIA. LGTH. MTL.

GRAVEL:

AMT. 15 Ton BAGS PWDR. REG.
SIZE # 3 BAGS LAYNEITE B-3

CEMENT:

BAGS USED 135 CLAY CEMENT
YDS. CONCRETE LGTH. 100'

SEAL:

METHOD OF DRILLING:

☐ STD. ROT. ☒ REV. ROT. ☐ CABLE TOOL ☐ AIR ROT.
☐ OTHER

MEASUREMENTS:

GROUND ELEV. ABOVE SEA LEVEL

DEPTH OF WELL AFTER PLUG 165' FROM ☒ GRD. LEV.
DEPTH TO GRAVEL WALL 90' FROM ☐ TOP OF CASING
☐ ORIG. GRD. LEV.

MISCELLANEOUS:

DATE WORK STARTED DATE FIRST PUMPED
DID WELL CLEAR UP HOW SOON
WAS SAND PUMPED HOW LONG
HOW LONG AGITATED HOW LONG PUMPED
CHEM. USED TO DEVELOP SAMPLE TAKEN

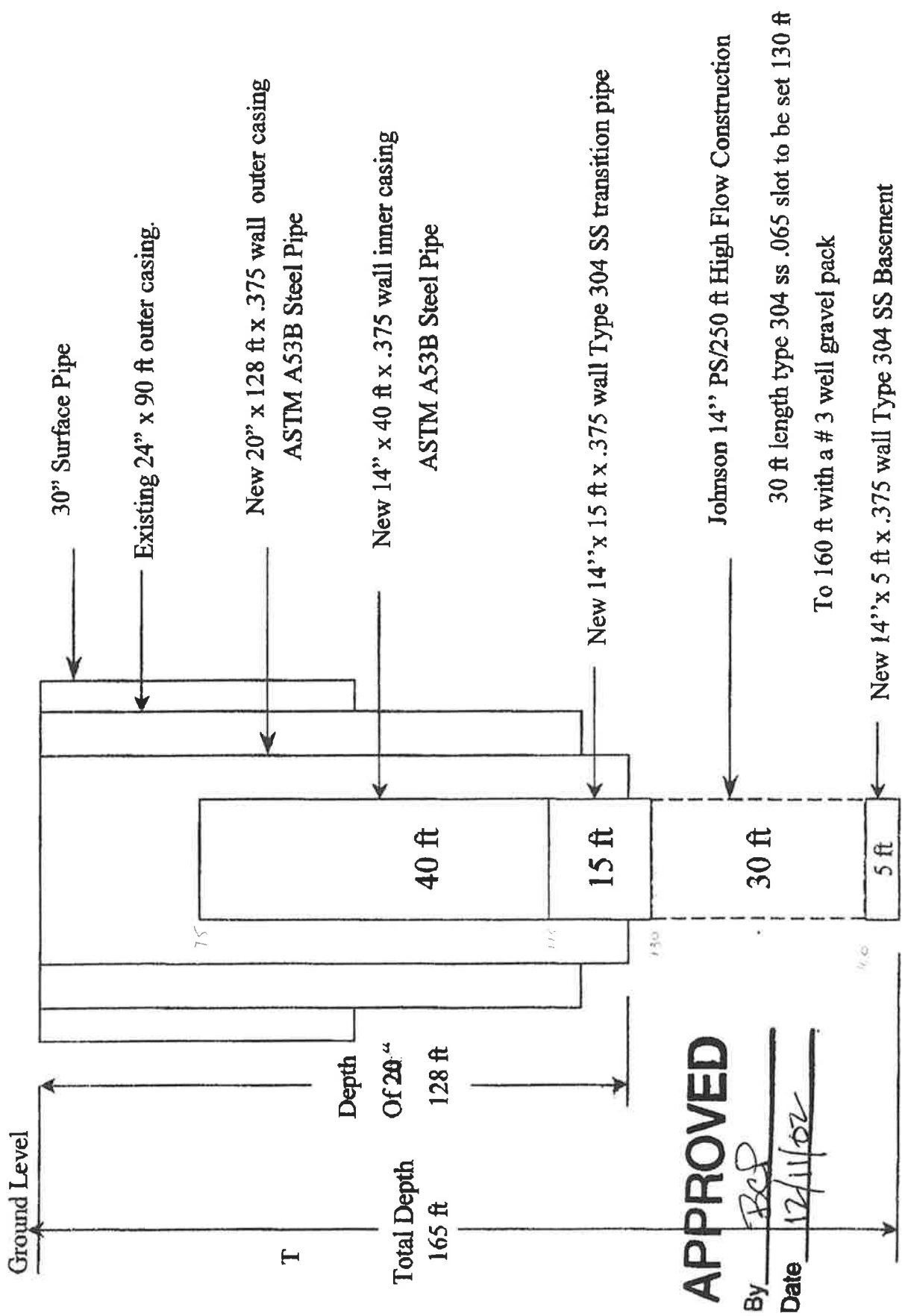
PRELIMINARY TEST DATA:

STATIC LEVEL DATE WATER TEMP.
CAPACITY GPM WITH PUMPING LEVEL

SKETCH OF LOCATION

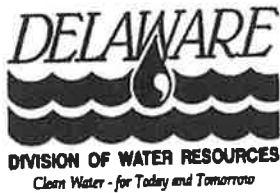
John
SIGNATURE OF DRILLER

Artesian Water Company Llangollen ASR Well Proposed well sketch 12/10/02



APPROVED

By BES
Date 12/11/02



PERMIT
156408-W



Tax Map Number: 10-041.20-015

1 of 5 page(s)

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

**Artesian Water Company, Inc.
664 Churchmans Road, Newark, DE 19702**

to construct and temporarily operate one test Public well.

Construction must be completed on or before 02/13/99, one year from permit issuance date. Construction must be done by a person duly licensed by the Delaware DNREC for such activity.

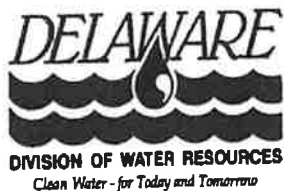
All current regulations governing well construction shall be followed.

All attached permit conditions shall be complied with.

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


AUTHORIZED SIGNATURE

02/13/98
DATE



PERMIT
156408-W
Conditions

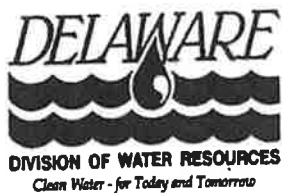


2 of 5 page(s).

Tax Map Number: 10-041.20-015

This Permit may be revoked upon violation of any of the following conditions:

- * The well shall be properly tagged in conformance with current regulations.
- * A well completion report shall be submitted to the Water Supply Section with 30 days of completion of well construction.
- * At least 24 hours prior to constructing this well, the Water Supply Section shall be notified at (302) 739-3665.
- * Representatives of the Division of Water Resources, Delaware Geological Survey and the U.S. Geological Survey may inspect such work at any time and may conduct tests, geophysical logging and sampling, as deemed necessary.
- * The interconnection of multiple aquifers is prohibited.
- * The well shall be capped at all times to limit access to the well by unauthorized persons and to exclude the entrance of any contaminants.
- * This permit and all conditions shall transfer to future owners of this property; identified by Tax ID# 10-041.20-015
- * The well casing shall be finished and maintained at least 12 inches above the established ground surface.
- * If identifiable contamination is observed during the drilling process, and the contamination was not anticipated or evaluated during the permit application and approval process, the well driller shall cease work and notify the Water Supply Section immediately by calling (302) 739-3665.



PERMIT
156408-W
Conditions

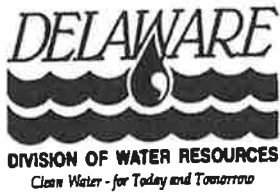


3 of 5 page(s).

Tax Map Number: 10-041.20-015

This Permit may be revoked upon violation of any of the following conditions:

- * If identifiable contaminants are encountered during the drilling process the drilling and related apparatus shall be adequately decontaminated prior to the construction of the next well or mobilization from the site, to prevent the transfer of contaminants.
- * This permit does not cover the structural stability of the project nor guarantee any specific quantity or quality of water.
- * Upon completion, the well and appurtenances shall be disinfected in conformance with State of Delaware regulations.
- * The annular space of this well shall be pressure grouted from 10 feet into the confining layer immediately above the source aquifer to ground surface in accordance with current regulations.
- * The well(s) authorized by this permit shall be abandoned or converted to another classification and use within 60 days of completion of the testing.
- * Approval for the use of this water for human consumption shall be obtained from the Office of Drinking Water at (302) 739-5410 in Dover, DE.
- * A raw water spigot shall be provided at the well head.
- * Water taken from this well is not to be used for human consumption.
- * The well shall not be constructed within a 150 foot radius of any underground waste water disposal system or within a 150 foot radius of a septic tank.



PERMIT
156408-W
Conditions



4 of 5 page(s).

Tax Map Number: 10-041.20-015

This Permit may be revoked upon violation of any of the following conditions:

- * The well shall not be used for the processing or preparation of food for sale.
- * This permit authorizes the temporary use of the well through 02/13/99, after which date the well must be converted to another classification or abandoned in accordance with current State of Delaware regulations.
- * The well(s) shall be adequately developed.
- * The minimum isolation distance from an underground gravity sewer line shall be 10 feet and shall be 50 ft from any underground sewage force main.

MAR-TO:

WATER SUPPLY SECTION
DIVISION OF WATER RESOURCES
P.O. BOX 1401, 89 KINGS HIGHWAY
DOVER, DELAWARE 19903
PHONE: 302-739-3665
FAX: 302-739-2296

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
AND ENVIRONMENTAL CONTROL

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

APPLICATION FOR A PERMIT
TO CONSTRUCT A WELL

PAGE 5 OF 9 PAGES

PERMIT NO. 156408-W

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

GENERAL INFORMATION

Property Owner ARTESIAN WATER Co., Inc
Address 664 Churchmans Rd
City NEWARK State DE Zip 19702
Telephone Number 302 453 6900
Application Preparer: ARTESIAN WATER Co.
Lic# 157 Date of Application 2-12-98
Estimated Construction Date 2-19-98
Purpose: ☒ Test or ☐ Permanent

Use: ☐ Domestic ☐ Irrigation
☐ Industrial ☐ Agricultural
☒ Public ☐ Heat Pump Recharge
☐ Miscellaneous Public ☐ Closed Loop Heat Pump
☐ Temporary For Well Construction ☐ Heat Pump Supply

☐ Other _____ (Specify)

Is this a replacement well? ☐ YES ☒ NO

Replacement reason _____

Septic system permit # SANITARY Sewer

Is public water available? ☒ YES ☐ NO

PROPOSED WELL CONSTRUCTION

| | Inner Casing | Outer Casing |
|-----------------------------|---|--------------|
| Approximate total depth | <u>170</u> | |
| Casing top (above grade) | <u>-50</u> | <u>2'</u> |
| Casing bottom (below grade) | <u>90</u> | <u>90'</u> |
| Casing diameter | <u>16"</u> | <u>20"</u> |
| Casing material | <u>STEEL</u> | <u>STEEL</u> |
| Tentative screen setting | <u>90</u> (top) To <u>162</u> | |
| Tentative screen length | <u>67</u> Material <u>S.S.</u> | |
| Type of Grout | <u>Cement</u> From <u>0</u> (top) To <u>90</u> | |
| Gravel pack | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO | |
| Gravel pack interval: From | <u>90</u> To <u>170</u> | |
| Desired capacity | <u>Test</u> GPM. | |
| Maximum daily use | <u>Test</u> GPD. | |

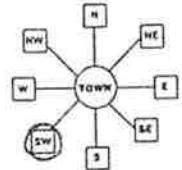
I HEREBY AFFIRM THE INFORMATION I HAVE SUBMITTED IS ACCURATE AND CORRECT.

Douglas E Rambo (AWC)
Signature - Application Preparer 2/12/98
Date
Douglas E Rambo (AWC)
Signature - Property Owner 2/12/98
Date

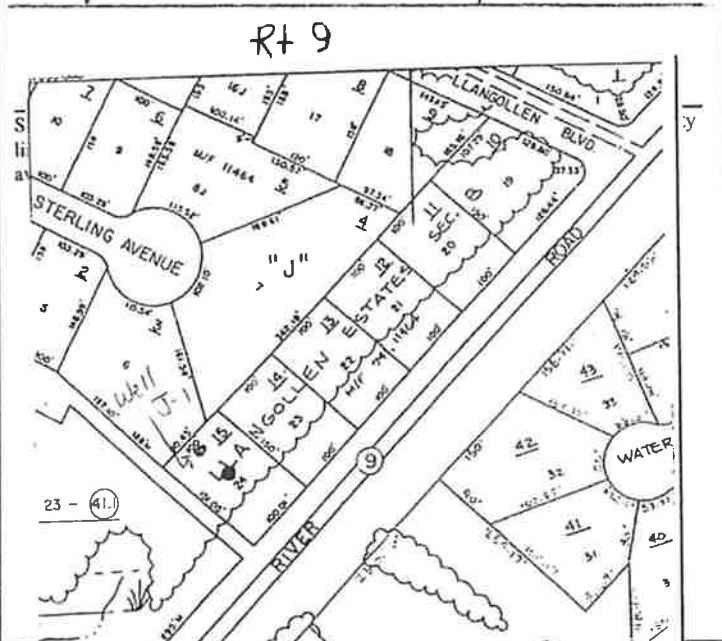
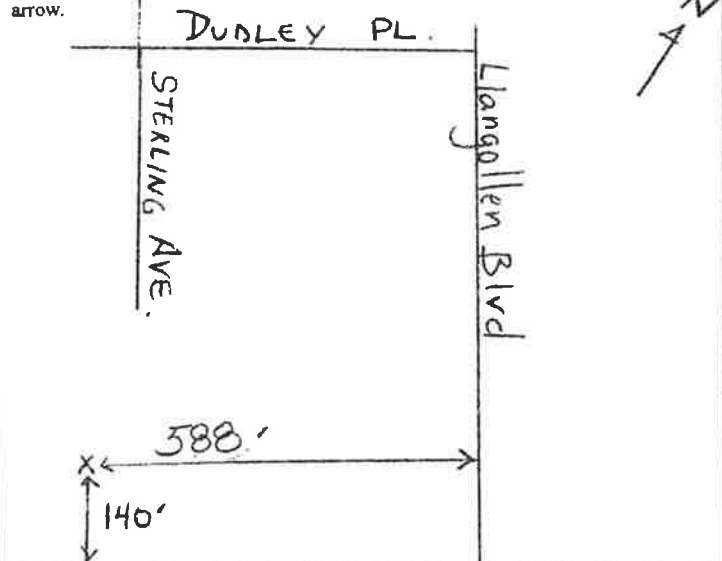
LOCATION MAP - ROAD MAP

County: ☒ New Castle ☐ Kent ☐ Sussex
Subdivision Llangollen ESTATES
Lot no. J-1
Tax ID # 10-041.20-D15
Name of nearest town NEWCASTLE
Distance to nearest town 2 MILES

DIRECTION OF WELL
FROM TOWN (CIRCLE BOX)



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.



PERMIT NO. 156408

RECEIVED

FOR OFFICIAL USE ONLY - DO NOT WRITE BELOW THIS LINE

Amount _____
Date FEB 12 1998
Received By _____

Modified Grid 090-331 Formation _____
Drainage Basin 113 Local ID _____
Aquifer _____

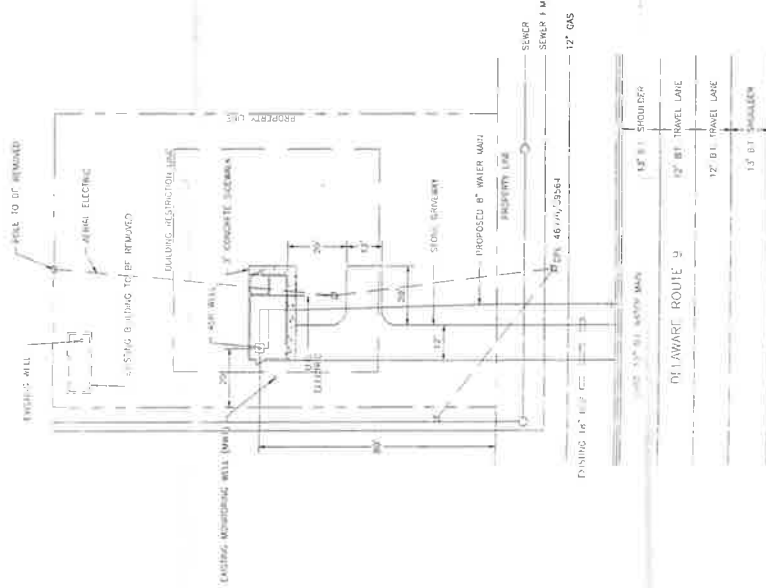
WATER SUPPLY • White Water Supply • Canary - Work • Pink - Owner • Goldenrod - Contractor

Doc No. 40-08/85/05/01-EC 2

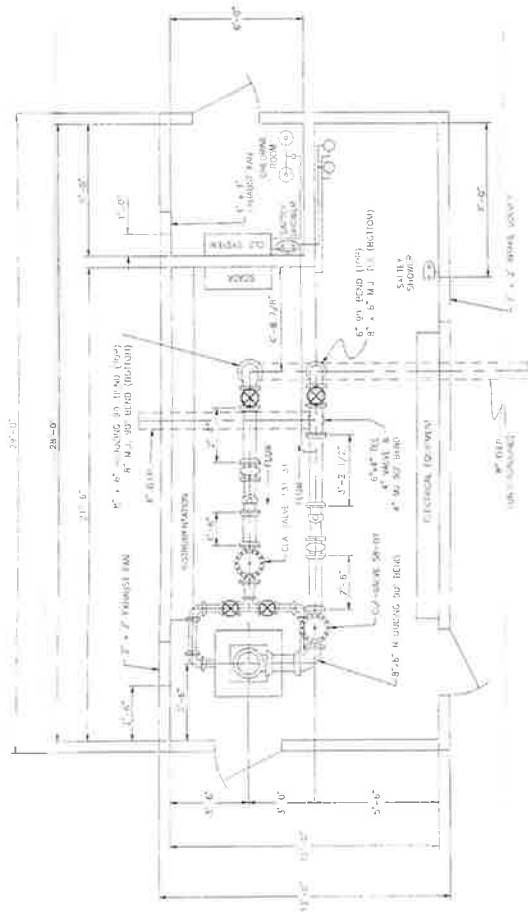
Attachment III
Injection Related Equipment (Permit Section J)

General Notes

1. ALL ABOVE GROUND PIPING SHALL BE FLANGED DUCTILE IRON, CLASS S3
2. ALL BURIED PIPING SHALL BE MECHANICAL JOINT DUCTILE IRON, CLASS S2
3. EXISTING AERIAL ELECTRIC SERVICE SHALL BE MAINTAINED AFTER FIRST PRIVATE POLE. ELECTRIC SERVICE WILL BE UNDER GROUND FROM THIS POINT.
4. THIS DRAWING DOES NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
5. ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT AND ALL RULES AND REGULATIONS THERE TO APPLICANT.
6. CONTRACTOR SHALL CALL MISS UTILITY OF DELAWARE (1-800-282-5555 IN DELAWARE) TWO WORKING DAYS PRIOR TO BEGINNING EXCAVATION.
7. PROPERTY INFORMATION OWNER: ARTESIAN WATER COMPANY, INC. TAX PARCEL NO.: 010-04120-015



SITE PLAN
SCALE: 1" = 20'



WELL HOUSE PIPING PLAN
SCALE: 3/8" = 1'-0"

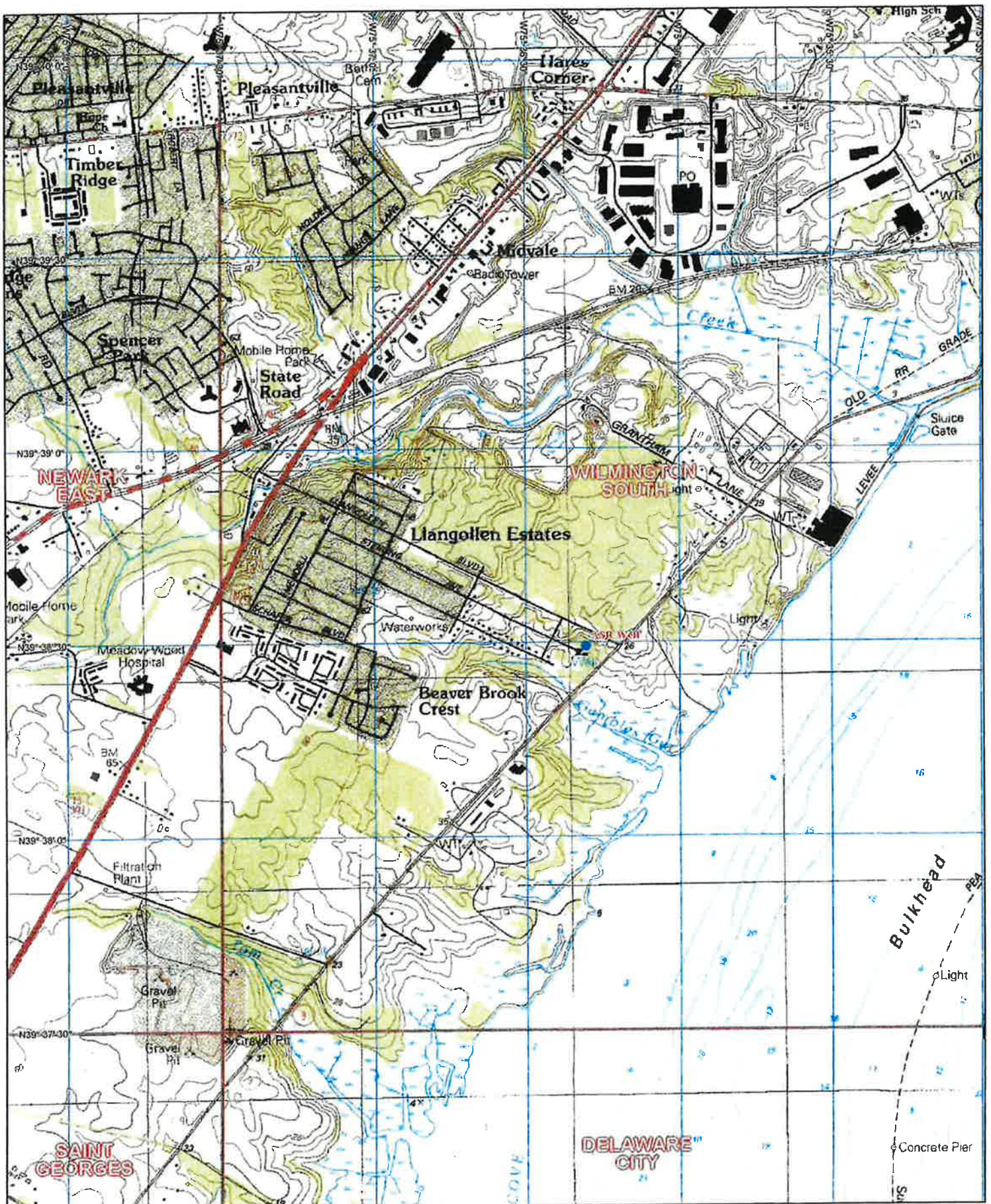
| Rev. | Description/Issued | Drawn |
|------|--------------------|-------|
| | | |

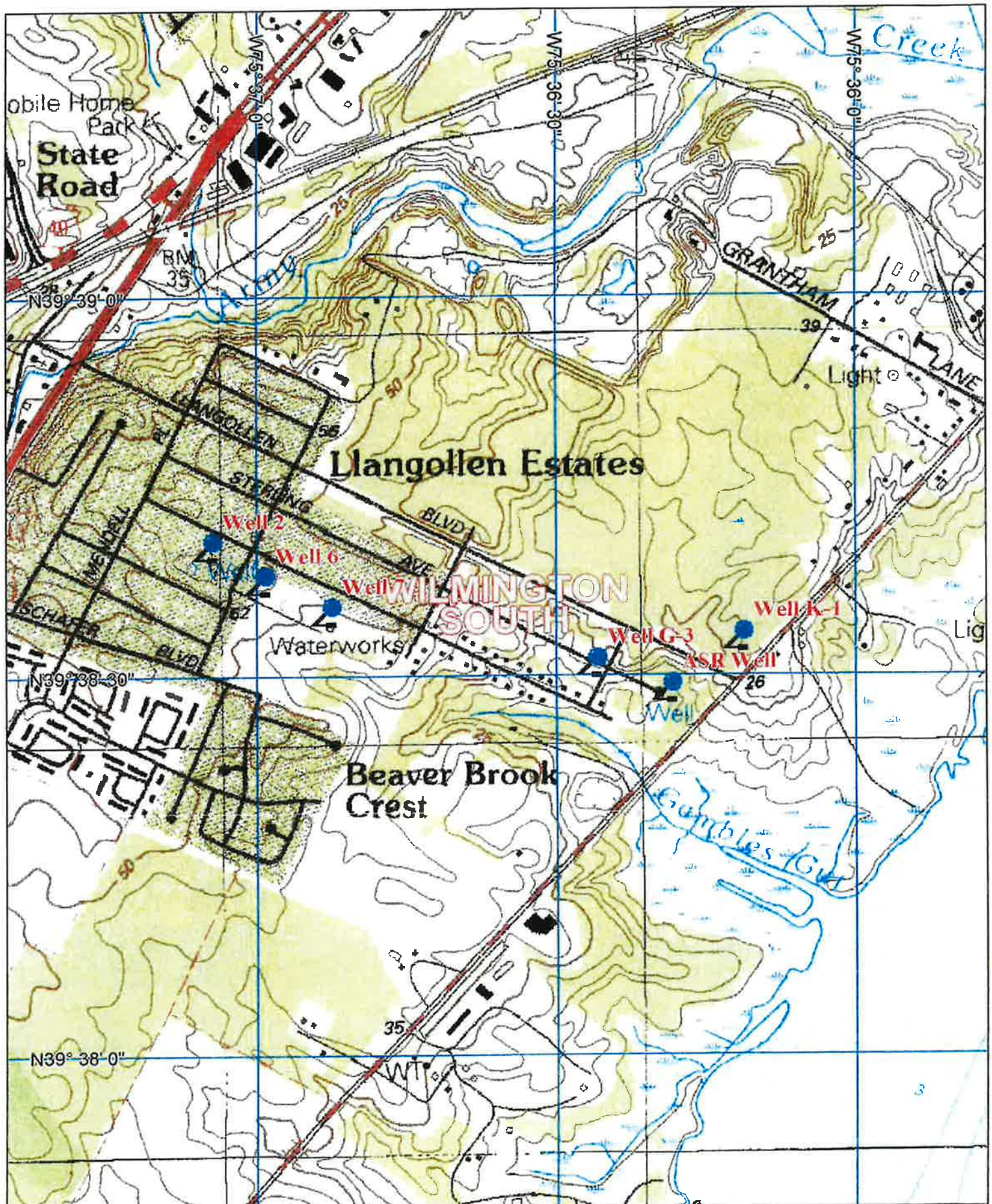
ARTESIAN WATER COMPANY, INC.
884 CHURCHMAN ROAD
NEWARK DE 19702
PHONE: (302) 453-6600
FAX: (302) 453-6600

ACQUFER STORAGE AND
RECOVERY WELL AS-BUILD
LLANGOLLEN ESTATES
DRAWN BY: BCP & RAB

| | | | |
|---------|---------------|-------|--------|
| Project | LLAN-AS-BUILD | Sheet | 1 OF 1 |
| Date | 10/23/03 | | |
| Drawn | AS SHOWN | | |

Attachment IV
Topographic Map (Permit Section K)



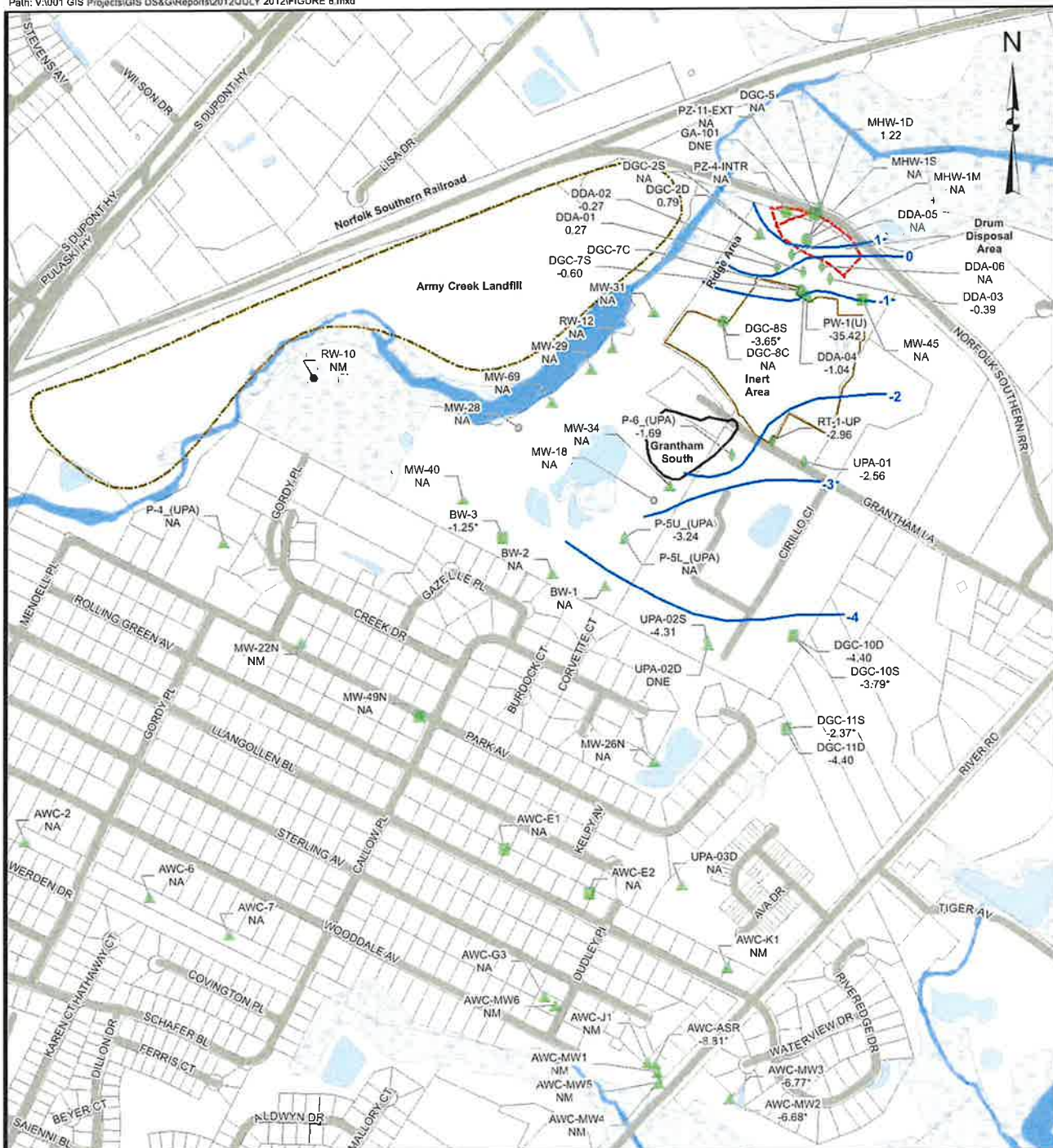


Attachment V
Area of Review (Permit Section L)

The UIC permit application requests information on wells located within 500 feet of the injection well. The only wells within 500 feet are monitoring wells associated with this project. Information on these wells is listed in the table below.

| Well Name | Permit No. | Owner | Location | Total Depth | Screen Interval | Year Built | Well Use |
|------------------|-------------------|--------------|-----------------|--------------------|------------------------|-------------------|-----------------|
| MW-1 | 154641 | Artesian | River Road | 170 | 122-162 | 1998 | Monitoring |
| MW-4 | 179609 | Artesian | River Road | 210 | 144-164 | 2000 | Monitoring |
| MW-5 | 180113 | Artesian | River Road | 210 | 92-112 | 2000 | Monitoring |
| J-1 | 155074 | Artesian | River Road | 202 | 122-162 | 1971 | Monitoring |

There are two nearby hazardous waste facilities. Delaware Sand and Gravel Landfill Superfund site is located approximately 3,200 feet away, and the Army Creek Landfill site is located approximately 4,500 feet away from the site. These facilities and the wells in the area are shown on the attached map of Delaware Sand and Gravel Landfill by Golder Associates.



LEGEND

- ◆ Well screened in UPA Upper Sand
- ▲ Well screened in UPA Lower Sand
- Well screened across UPA Upper Sand and Lower Sand
- Well screened in Columbia Aquifer
- Well Screen Interval Not Provided

— UPA Upper Sand Groundwater Contours - April 2012

NM = Not Measured April 2012

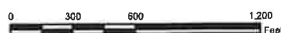
NA = Measured in April 2012 but is not applicable to the geologic unit depicted

DNE = Did Not Exist

* Indicates datapoint not used in contouring

REFERENCE

Base data taken from New Castle County Delaware, Department of Land Use, "eParcel View Map" web site GIS data download. Data acquired 01/18/2012.



1 inch = 600 feet

FIGURE 8

| FILE NO. | PROJECT NO. | DATE | BY | CHKD | APPD |
|-------------|-------------|------------|----------|------|------|
| 01-5662-007 | 01-5662-007 | 01/18/2012 | AS SHOWN | | |
| 01-5662-007 | 01-5662-007 | 01/18/2012 | AS SHOWN | | |
| 01-5662-007 | 01-5662-007 | 01/18/2012 | AS SHOWN | | |
| 01-5662-007 | 01-5662-007 | 01/18/2012 | AS SHOWN | | |

UPA UPPER SAND GROUNDWATER CONTOURS APRIL 2012

Delaware Sand and Gravel
Superfund Site
New Castle, Delaware

