# **Bid Document For Drilling Services** Colesville Landfill, Broome County, New York.

# **1.0 GENERAL SPECIFICATIONS**

ARCADIS Geraghty & Miller, on behalf of Broome County and GAF Corporation, is soliciting bids for well drilling services in and around the area of the Colesville Landfill, Town of Colesville, Broome County, New York. This bid document consists of two parts, the first part provides specifications for the subject work; the second part provides a bid sheet to be utilized by firms wishing to submit a competitive bid proposal for the subject work.

Broome County is funding this project; therefore all estimates must be based on prevailing New York State wage rates. All bid proposals must be submitted on the enclosed bid sheet and any additional information, which may be helpful in evaluating bids, should be attached to the bid sheet. Please refer to the attached schedule for milestones to be met as part of submittal of this bid. Completed bid packages are to be received at the following address:

> ARCADIS GERAGHTY & Miller, Inc. 88 Duryea Road, 1<sup>st</sup> floor Melville, New York 11747 Attention: Mr. David Stern

#### **1.1 LOCATION AND DESCRIPTION OF SUBJECT WORK**

The selected bidder (hereinafter referred to as the CONTRACTOR) shall perform all operations, and provide all necessary manpower, materials, equipment, tools, and services required to drill, install, and develop 13 injection wells and 2 groundwater extraction wells and redevelop existing Extraction Well PW-3. The subject work will be performed at and near the Colesville Landfill located in Colesville, Broome County, New York (hereinafter referred to as the site).

The injection wells will be installed on 30-foot centers along the southwest perimeter of the landfill. Extraction wells will be drilled at predetermined locations in the southwest portion of the site. Unless field conditions warrant, work hours shall be a standard 8-hour day (8:00 a.m. to 4:00 p.m.). All work required by these specifications shall be performed under the oversight of ARCADIS Geraghty & Miller, Inc. (hereinafter referred to as the CONSULTANT). Injection wells shall be drilled, installed, and developed in the following general order, however, site-specific conditions and the second may cause the sequence to be modified: - 45

- Drilling well borehole (6-inch) and collecting split-spoon core samples, as specified 1. in Section 2.1 (Well Drilling, Logging, and Formation Sampling)
- Constructing well (includes setting the well-casing and screen and installing the 2. backfill materials, seals, and locking protective casing), as specified below.
- 3. Developing well, as specified below. . . .

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Extraction wells shall be drilled, installed, and developed in the following general order, however, site-specific conditions may cause the sequence to be modified:

- 1. Drilling pilot borehole (6-inch) and collecting split-spoon core samples, as specified in Section 2.1 (Well Drilling, Logging, and Formation Sampling).
- 2. Conducting sieve analysis of selected split spoon samples material (by CONTRACTOR).
- 3. Reaming borehole to proposed total diameter (between 12 inches and 14-inches) and total depth.
- 4. Selection of screen interval and slot size (by CONSULTANT) and ordering screen and casing (by CONTRACTOR).
- 5. Constructing well (includes setting the well casing and screen and installing the filter pack materials, seals, and locking protective casing), as specified below.
- 6. Developing well, as specified below.
- 7. Conducting one four-hour step-drawdown test of each extraction well.

Utility markouts will be coordinated by CONSULTANT through the Underground Facilities Protective Organization (UFPO) prior to drilling. As several locations will be near overhead lines, CONSULTANT will either arrange for power to be shut off while the drilling rig is in proximity (as defined in 16 NYCRR Part 753) to overhead lines or identify a suitable alternate location.

#### 1.2 SITE CONDITIONS AND HYDROGEOLOGY

The Colesville Landfill is an inactive (closed) landfill. The entirety of the work will be conducted on-site (property owned by Broome County). Site topography is relatively flat at the top of the landfill (where the majority of the injection wells will be installed) to steeply sloping further from the landfill perimeter (where the extraction wells will be installed). The generalized geologic sequence at the landfill from land surface downward is as follows:

- Unconsolidated man-made fill overlying glacial till consisting of unstratified clayey silt to silt and clay, little gravel and little sand.
- glacial outwash consisting of brown sand to gravel, with varying amounts of silt.
- glaciolacustrine clay consisting of brown silt to silt and clay, trace fine sand, varved, laminated.

Depth to water across the study area varies between 12 feet below land surface (ft bls) furthest from the landfill (where the extraction wells will be installed) to approximately 50 ft at the landfill perimeter (where the injection wells will be installed).

Additional information on the site hydrogeology is available from CONSULTANT for inspection by interested bidders. It is the bidder's responsibility to be familiar with the site and conditions that shall affect his bid.

### 1.3 EXPERIENCE AND QUALIFICATIONS

All bidders must have experience in installing wells similar to those described herein and be licensed well drillers in the State of New York. A statement of experience and qualifications is required and must be submitted with the bid price. No portion of this work may be subcontracted unless CONSULTANT grants prior approval, in writing. A statement of subcontractor experience and qualifications may be requested before subcontractor approval is granted.

Bidders must have drilled a minimum of ten wells of the type and depth described herein, and upon request, must furnish a list of these wells showing the owner, location, construction, and depth of the wells.

## 1.4 PERMITS AND REGULATIONS

CONTRACTOR, at his expense, shall procure all necessary permits, bond applications, and/or licenses from the appropriate authorities to conduct the work described herein.

CONTRACTOR shall comply with all local, state, and federal regulations. If CONTRACTOR believes that the specifications provided herein are at variance with any law or regulation, he shall promptly notify CONSULTANT, in writing, and any necessary adjustments shall be made as provided in the Contract or Agreement under "Changes in the Work".

## 1.5 EQUIPMENT AND MATERIAL DELIVERY, STORAGE, AND HANDLING

All arrangements for delivery and handling of equipment and material, throughout the prosecution of the work, shall be the CONTRACTOR'S responsibility. CONTRACTOR shall store equipment and materials on-site so as to ensure the preservation of their quality and fitness for the work. When considered necessary by the CONSULTANT, they shall be placed on wooden platforms, or other hard, clean surfaces, and shall be placed under cover when directed. Materials shall be stored at the location(s) designated by CONSULTANT, and shall be arranged so as to facilitate prompt inspection by the on-site CONSULTANT representative.

# 1.6 QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance/Quality Control measures shall conform to the requirements of the conditions of the Contract, except as modified below.

- 1. Upon request, CONTRACTOR, at his expense, shall furnish copies of certificates or other pertinent documents from suppliers/manufacturers showing that all materials using during well drilling, installation and development including, but not limited to, casings, screens, and backfill materials (i.e., gravel pack, bentonite pellets, bentonite slurry, etc.) conform to the requirements of these specifications.
- 2. Materials for well construction shall comply with the American Society for Testing and Materials (A.S.T.M.).

## **1.7 TECHNICAL INSPECTION**

All work conducted under these specifications shall be subject to routine inspection by the CONSULTANT; however, such inspection shall not relieve the CONTRACTOR from any obligation to perform said work in accordance with specifications or any modification thereof, as herein provided. Work not done in strict accordance with the specifications or any modification thereof, as herein provided, shall be corrected and made good by the CONTRACTOR at his expense whenever so ordered by CONSULTANT, without reference to any previous oversight or error in inspection.

If the CONTRACTOR has made all possible efforts, used proper methods for drilling the wells/borings (including boreholes for which a specific drilling method was requested by CONSULTANT) and in the opinion of CONSULTANT has taken all the required and necessary precautions, but nevertheless the required results cannot be obtained, the well/boring will be abandoned and the drilling rig moved to a nearby location and a replacement well/boring will be drilled. Payment, computed on the basis of unit bid price per linear foot, will be made to the CONTRACTOR for the actual length of well/boring (abandoned and replacement) drilled. However, if a well/boring has to be abandoned for fault, negligence, or incompetence of the drilling crew, faulty or improper equipment, loss of tools, or collapse of the casing or borehole, no payment shall be made to the CONTRACTOR for drilling or abandoning the well/boring and moving to another location to drill a new well/boring. The decision of CONSULTANT shall be final and binding.

All directions given to the CONTRACTOR by CONSULTANT pertaining to the scope of work during routine inspection shall be binding on the CONTRACTOR.

# **1.8 SUBMITTALS**

Upon request by CONSULTANT, the CONTRACTOR shall submit the following:

- 1. Well driller's logs.
- 2. Qualifications of drillers, mechanics, technicians, and subcontractors.
- 3. Well construction details.
- 4. Well Permits

# 2.0 Specifications For Drilling, Installing, And Developing Injection And Extraction Wells

The work specified herein is required to meet methods that have been approved by the New York State Department of Environmental Conservation (NYSDEC). Well drilling, installing, and developing specifications are given below.

# 2.1 WELL DRILLING, LOGGING, AND FORMATION SAMPLING

A total of thirteen (13) injection and two (2) extraction wells will be drilled, installed, and developed. Additionally, one (1) existing extraction well and four (4) existing injection wells will be redeveloped. Table 1 summarizes the anticipated borehole diameter, well total depths, and anticipated drilling methodologies; CONSULTANT shall determine final well depths. Except as described below, drilling methodologies will be dictated by site conditions and the proposed well depths. Formation samples will be collected using a two-inch diameter, two-foot long split-spoon core-sampling device. Refer to Table 1 for estimated number of split spoon samples to be collected per well. In general, formation sample will be collected as follows:

- 1. Injection Wells: Collect at the estimated water table interface and at the midpoint of the screened interval for an estimated total of two (2) split spoons per well. However site conditions may warrant a change in this number.
- 2. Extraction Wells: Collect at four-foot intervals to the water table (approximately 12 ft bls), and continuously until lacustrine deposits are encountered (approximately 30 ft bls) for an estimated total of twelve (12) split spoons per well. However, site conditions may warrant a change in this number. Up to four (4) of the split-spoon samples per well will be submitted for sieve analysis by the CONTRACTOR.

# 2.2 WELL CONSTRUCTION AND INSTALLATION

In accordance with the specifications provided herein, the well screen and casing, and all backfill materials shall be installed within the hollow-stem augers. The augers shall be removed as well installation proceeds. Well installation shall be a continuous process until all sealant materials are emplaced. CONSULTANT shall determine final screen setting.

# 2.3 WELL CASING AND SCREEN

Only new, undamaged, and domestically manufactured well casing and screen, meeting API and ASTM water well standards, shall be used. A vented PVC well cap and threaded PVC bottom cap shall be installed on each well. The well casing and screen specifications are as follows:

- 1. Injection wells shall be constructed of 2-inch inside diameter (ID), schedule 40, NSF-grade polyvinyl chloride (PVC) well casing and screen. All well screens (slotted construction) will be 10 slot (0.010 inches). Initially, wells will be completed approximately 2 ft above grade and to permit installation of pitless adaptors (to be completed by others). Once the below-grade piping is installed by others, the well will be completed by CONTRACTOR with a flush-mounted wellhead assembly in conformance with ASTM.
- Extraction Wells shall be constructed of 6-inch ID, schedule 80, NSF-grade polyvinyl chloride (PVC) well casing and screen. Well screen slot sizes will be selected by CONSULTANT based on the sieve analysis report, and screens will be ordered by CONTRACTOR. Initially, wells will be completed approximately 2 ft above grade and to permit installation of pitless adaptors (to be completed by others).

# 2.4 WELL CASING AND SCREEN JOINTS

All casing and screen sections shall be flush-joint, internally threaded. Joints shall be made up so that when tight, all threads are buried within the casing walls. No coupling, solvents, glues, or chemical cleaners shall be used in well construction.

#### 2.5 INSTALLATION OF GRAVEL AND SAND PACK

After setting the well screen and casing, the appropriately sized gravel pack shall be emplaced within the borehole annulus, to a depth as agreed to by the CONTRACTOR, in consultation with CONSULTANT. For purposes of this bid, well gravel will be assumed to be emplaced to a minimum of 3 ft above the top of the screen.

A fine sand layer (finer than gravel pack) will be emplaced in the annulus on top of the gravel pack in the same manner as the gravel pack, at a thickness as agreed to by the CONTRACTOR, in consultation with CONSULTANT. For purposes of this bid, fine sand thickness is assumed to be emplaced to 2 ft above the top of the gravel pack.

The gravel and fine sand pack shall be carefully poured down the annulus and its depth shall be carefully checked during emplacement to be sure that it has not bridged. If, in the opinion of the CONSULTANT, bridging has occurred (based on the calculated volume of pack required versus the volume used), the CONTRACTOR shall be required to correct the situation, at his expense, either by using compressed air to remove the gravel pack, or by removing the well, cleaning the hole, and beginning well construction again.

## 2.6 WELL SEALANT

A high-solids, 100 percent polymer-free bentonite seal (ratio of bentonite (lbs) to water (gal) – 1.25:1) shall be installed by tremie pipe (slurry only) within the annular space above the fine sand layer. The bentonite seal shall be a minimum of 2-ft thick as measured immediately after placement, without allowance for swelling. The tremie pipe shall be gradually removed from the annular space as the slurry is added from the bottom up.

A polymer-free bentonite slurry (VOCLAY) shall be installed within the annular space above the bentonite seal using a tremie pipe. In all wells, the slurry shall be installed to approximately 5 ft below land surface in one continuous operation. Manufacturer's specifications for all bentonite products must be submitted and approved by CONSULTANT prior to use.

# 2.7 PROTECTIVE CASING

As described in Section 2.3 (Well Casing and Screen), injection wells will be fitted with pitless adaptors (by others) prior to completing the wellhead assembly. At the direction of CONSULTANT, injection wells shall be completed at grade by cementing a 6-inch diameter, locking curb box in place over the wells. A fine sand shall be installed above the top of the bentonite slurry and inside the curb box to permit any water which may accumulate inside the curb box to drain.

# 2.8 ABANDONMENT OF BORINGS OR WELLS

In the event that the CONTRACTOR should fail to drill a hole or place the well to the depth specified, or should abandon the hole or well because of loss of tools or for any other cause, he shall remove all salvageable casing and equipment and fill the abandoned hole with a bentonite and cement mixture using a tremie pipe. The CONTRACTOR shall then move the drill rig to a new location approved by CONSULTANT and begin drilling a new borehole. This work shall be done at the CONTRACTOR'S expense who may use salvaged materials, if usable, at the discretion of

CONSULTANT. No payment shall be made to the CONTRACTOR for installing or abandoning unsuccessful borings or wells, except as described above in Section 1.7 (Technical Inspection).

# 2.9 WELL PLUMBNESS, ALIGNMENT, AND ACCEPTANCE

The completed wells, including well casing and screen, shall be free from mechanical defects and sufficiently straight and plumb to permit the installation of a permanent pneumatic submersible pump. It is the responsibility of the CONTRACTOR to ensure that the well construction meets the requirements of the pump supplier and these Technical Specifications.

# 2.10 WELL DEVELOPMENT/RE-DEVELOPMENT

Following installation, all wells shall be developed by pumping (and backwashing) with a submersible pump, mechanical surging, pumping with air, air/water jet, or any combination of the above. The existing wells (Table 1) will be redeveloped using the same methods following completion of the new injection/extraction well network. Development will continue until the well responds freely to water-level changes in the formation and the well produces clear, sediment-free water, to the extent practical. CONSULTANT will determine when development is complete.

Dispersing agents, acids, disinfectants, or other additives will not be used. During development, water will be removed throughout the entire column of water standing in the well by periodically lowering and raising the pump intake.

Well development will include rinsing the interior well casing above the water table by using only water from that well. The well will be covered with a clean well cap, which will be rinsed with distilled water prior to installation. The result of this operation will be a well casing free of extraneous materials (grout, bentonite, sand, etc.).

In compliance with NYSDEC policy, every effort will be made to develop wells until turbidity (as measured in the field) is less than 50 nephelometric turbidity units (NTUs). However, CONSULTANT is aware that the 50 NTU standard may not be attainable, as the observed turbidity may be the result of the formation screened, and not inefficiencies in well design, installation, or development. Therefore, if after a "best well development effort," the 50 NTU standard cannot be attained and turbidity stabilizes (above the 50 NTU standard), the well will be acceptable, provided the integrity of the well is satisfactorily proven.

# 3.0 Decontamination of Equipment And Materials

When drilling on-site, all downhole equipment and materials used in the drilling, installing, and developing of the wells shall be decontaminated using high pressure/temperature steam cleaning at a centrally located (on Broome County property) decontamination pad via steam cleaning prior to use, between wells, and before leaving the site at the completion of work.

# 4.0 Disposal of Waste Materials

CONTRACTOR is responsible for proper management of all waste streams generated during well drilling, installation, and development, and will ensure that all wastes are stored in a manner acceptable to CONSULTANT. All cuttings generated from drilling shall be staged next to the drilling location and raked out after the well is complete, or at the direction of CONSULTANT. All

development water shall be discharged to land surface, preferably away from the well network location, as directed by CONSULTANT.

# 5.0 Site Maintenance and Restoration

The CONTRACTOR shall, at all times, maintain the work site in a clean, workable condition. Prior to well acceptance, the CONTRACTOR shall be required to level off any trenches and/or pits, dispose of all material as directed by CONSULTANT, and restore the site to its original condition, to the extent possible.

# 6.0 Health And Safety

Based on a site hazard evaluation, it is anticipated that all operations described herein shall be conducted using Level D or modified Level D protection, unless on-site monitoring (by CONSULTANT) indicates a necessity for upgrading. Level D protection consists of a hard hat, safety glasses, rubber boots, and gloves (i.e., latex, nylon, or PVC). Modified Level D protection consists of Level D equipment plus Tyvek coveralls (blue or green) or rain gear and an inner glove, as well as taping coveralls to the boots and gloves. Level C upgrade is not anticipated; costs for this contingency should be developed, but not included in the total bid price. A copy of the Health and Safety Plan (HASP) is available upon request from CONSULTANT for interested bidders. Bidders shall be responsible for providing crews with necessary personal protection to conform to the site-specific HASP requirements or their own plan, which must be as stringent as the site-specific HASP. CONSULTANT shall provide air monitoring and monitor worker health and safety.

# 7.0 Standby Time

CONTRACTOR standby time shall be charged when CONSULTANT stops work for reasons other than is specified in the preceding sections of this bid document. Standby time will only be charged upon verbal approval from CONSULTANT. If for any reason, CONTRACTOR believes standby time is warranted, he shall immediately notify CONSULTANT. If standby time is warranted, it will be charged according to the rate specified in the bidsheet. Accordingly, CONTRACTOR should develop costs for standby time, but should not include any costs in his bid price. CONSULTANT is not responsible for standby time incurred by the bidder's subcontractors that is not directly the result of CONSULTANT's direction.

# **Bidsheet for Drilling Services**

Item	Item Description	Estimated Quantity	Unit Cost (\$)	Subtotal (\$)	Drille Initial	
1	Mobilization/Demob	ilization	Lump Sum			
2	Overburden Drilling,	4 ¼″ ID HSA	1,100 ft.			
3	Overburden Drilling,	10" ID HSA	70 ft.			
4	2" Split Spoons		50 units			
5	Sieve Analysis		8 units			
6	2″-dia Sch. 40 PVC	Casing	770 ft.			
7	2"-dia. Sch. 40 PV0	C 0.010-Slot Screen	260 ft.			
8	6"-dia. Sch. 80 PV0	C Casing	35 ft.			
9	6"-dia. Sch. 80 PVC (Slot size to be dete		30 ft.			
10	Gravel Pack	Injection Wells	300 l.f.			
	(Filpro #0)	Extraction Wells	36 l.f.			
11	Fine Sand Pack (Filpro #00)	Injection Wells	26 l.f.			
		Extraction Wells	4 I.f.			
12	Bentonite Seal	Injection Wells	26 l.f.			
	Bentonite Sear	Extraction Wells	4 l.f.			
13	Bentonite (VOCLAY	)	600 l.f.			
14	6"-dia. Flush-mount	protective casing	13 units			
15	8"-dia temporary pr	otective casing	2 units			
16	4"-dia temporary pr	otective casing	Max. 13 units			
17	Well Development/F	Re-Development	170 hours			
18	Step Testing (Extrac	tion Wells)	10 hours			
19	Decontamination		40 hours		· · · ·	
20	Standby Time (do n	ot include in total bid)				
21	Level C upgrade (do not include in to	tal bid)				
All esti	es should not include imates to be based or	sales tax.	TOTAL BID:			

Contractor's Signature

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# **Bid Schedule**

Milestone	Date						
Distribution of Bid Packages	July 21, 2000						
Pre-Bid Site Walkthrough	July 27, 2000	-, , , , , , , , , , , , , , , , , , ,					
Final Bids Due at AG&M's Melville, NY office	August 4, 2000						
Contract Awarded	August 11, 2000						
Mobilization to Site to Begin Work	August 21, 2000	. <del></del>					
Estimated Project Completion Date	October 20, 2000						

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Table 1. Injection and Extraction Well Drilling and Installation Specifications, Colesville Landfill, Broome County, New York.

Well Identification	Borehole Depth (ft bls)	Pilot Borehole Diameter (inches)	Well Borehole Diameter (inches)	Nominal Tool Inner Diameter and Well Drilling Method	Well Casing/ Screen Diameter (inches)	Well Casing/ Screen Composition	Well Total Depth (ft bls)	Screened Interval (ft bls)	Number of Split- Spoons	Top Gravel Pack (ft bls)	Top Fine Sand (ft bls)	Top Bentonite Seal (ft bls)	Total Developmen Time (hours)
Proposed Ex	traction W	ells		· · · · · · · · · · · · · · · · · · ·		···							
GMPW-4	35	6	13½	10-inch ID HSA	6/6	Sch. 80 PVC/0.010 slot	35	15 - 30	12 <sup>.</sup>	12	10	8	16
GMPW-5	35	6	13½	10-inch ID HSA	6/6	Sch. 80 PVC/0.010 slot	35	15 - 30	12	12	10	8	16
Existing Extr	action Wel	ls (Redeve	lopment or	nly)									
GMPW-3	35	N/A	11	6-5/8 ID HSA	4/4	SS / 0.012 slot	35	15 - 30	N/A	N/A	N/A	N/A	10
Proposed Inj	ection Wel	is											
IW-3	70	N/A	6	4 -in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	70	50 – 70	2	47	45	43	8
W-4	70	N/A	6	4 -in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	70	50 – 70	2	47	45	43	8
IW-5	75	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	75	55 – 75	2	52	50	48	8
IW-6	75	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	75	55 - 75	2	52	50	48	8
W-7	75	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	75	55 – 75	2	52	50	48	8
W-8	75	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	75	<b>55 –</b> 75	2	52	50	48	8
W-9	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 – 80	2	57	55	53	8
IW-10	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 - 80	2	57	55	53	8
IW-11	· 80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 – 80	2	57	55	53	8
IW-12	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 - 80	2	57	55	53	8
IW-13	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 – 80	2	57	55	53	8
IW-1 <b>4</b>	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 – 80	2	57	55	53	8
IW-15	80	N/A	6	4-in. ID HSA	2/2	Sch. 40 PVC/0.010 slot	80	60 - 80	2	57	55	53	8

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Well Identification	Borehole Depth (ft bls)	Pilot Borehole Diameter (inches)	Well Borehole Diameter (inches)	Nominal Tool Inner Diameter and Well Drilling Method	Well Casing/ Screen Diameter (inches)	Well Casing/ Screen Composition	Well Total Depth (ft bls)	Screened Interval (ft bls)	Number of Split- Spoons	Top Gravel Pack (ft bls)	Top Fine Sand (ft bls)	Top Bentonite Seal (ft bls)	Total Development Time (hours)
Existing Inje	ction Wells	(Redevelo	opment On	ly)	<u> </u>	· · · · · · · · · · · · · · · · · · ·						<del></del>	
IW-1 IW-2 GMMW-1 PW-6	74 70 70 68	N/A N/A N/A N/A	8½ * 8½ 8½ 8½	4¼ ID HSA 4¼ ID HSA 4¼ ID HSA 4¼ ID HSA	2/2 2/2 2/2 2/2	Sch. 40 PVC/ 0.010 slot Sch. 40 PVC/ 0.010 slot Sch. 40 PVC/ 0.010 slot Sch. 40 PVC/ 0.010 slot	74 74 70 68	34 - 74 50 - 65 50 - 65 53 - 63	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A	N/A N/A N/A N/A	8 8 8 8
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