MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS & CONSULTANTS

December 9, 2003

Dr. Jin Park
RealCo, Inc.
P.O. Box 9
Lakeview, New York 14085

Re: RealCo, Inc., Watervliet, New York
Former AlTech Landfill – Monitoring Well Network Completion Report

Dear Dr. Park:

Malcolm Pirnie, Inc. (Malcolm Pirnie) is pleased to present RealCo, Inc. (RealCo) with this letter report describing the completion of the post-closure monitoring well network for the former AlTech landfill. This work was conducted in accordance with the final Environmental and Site Analytical Plan prepared by Malcolm Pirnie and submitted to the New York State Department of Environmental Conservation (NYSDEC) on June 9, 2003 and the work plan proposal submitted by Malcolm Pirnie. This letter summarizes the results of the monitoring well installation, development, refurbishment, and abandonment at the former AlTech Landfill.

EXECUTIVE SUMMARY

The following tasks were proposed to complete the monitoring well network:

- Abandon nine wells (MW-1, MW-2, MW-3, MW-6, MW-7, MW-8, MW-12, MW-13, and MW-15) in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Procedures (Malcolm Pirnie, Inc., October 1996).
- Refurbish four existing monitoring wells (MW-10, MW-16, MW-16B, and MW-20B).
- Install and develop four new overburden wells.
- Install and develop five new bedrock wells.

- Install and develop eight wells in which the screened intervals would be determined during drilling.

Malcolm Pirnie conducted field oversight of the groundwater monitoring well installation and development. Field conditions caused some field activities to deviate slightly from those proposed in the work plan. The following tasks were completed:

- Abandoned three wells (MW-7, MW-12, and MW-13). MW-3, MW-6, MW-8, and MW-15 could not be located and were therefore not abandoned. Monitoring wells MW-1 and MW-2 were not abandoned but will not remain in the sampling well network. They may be abandoned based on the water quality results from the replacement wells WW-1I and WW-2B.

- Refurbished MW-10, MW-16, and MW-16B.

- Installed and developed one well (WW-20B) to replace MW-20B, which could not be located.

- Installed and developed two new overburden wells (WW-5 and WW-17). WW-26 was installed to demonstrate the lack of appreciable yield in the overburden in the northern portion of the site. No overburden or interface wells were installed at WW-25B, WW-27B, or WW-28B because there was no appreciable groundwater in the overburden or interface at these locations.

- Installed and developed four new overburden/bedrock interface wells (WW-1I, WW-23I, WW-24I, and WW-26I). WW-1I was proposed as a bedrock well but it was installed as an interface well because there was water in the interface.

- Installed and developed eight new bedrock wells (WW-2B, WW-3B, WW-23B, WW-24B, WW-25B, WW-26B, WW-27B, and WW-28B).

METHODS

Parratt Wolfe personnel decontaminated augers, cutter heads, drill rods, split spoons, pumps, tubing, and any other non-dedicated equipment entering the bore holes before commencing work, and between each well boring. Soil cuttings and liquids derived from boring and development activities were contained in 55-gallon steel drums. As of November 25, 2003, all investigative derived waste was disposed of by RealCo in accordance with NYSDEC approval.

Borings for overburden wells were drilled by rotary methods using 4-¼-inch or 6- ¼-inch diameter hollow stem augers (HSA). All overburden monitoring wells were constructed of two-inch diameter PVC with 10 feet of 0.010-slot screen, and finished with four-inch diameter protective steel casings that extend above the ground surface.

Borings for bedrock wells were drilled to the bedrock interface using HSA or air-rotary methods. A five-foot rock socket was reamed into the bedrock, and a four-inch diameter steel casing was grouted in the rock socket and extended above the ground surface. In three of the bedrock wells (new monitoring well locations WW-23B, WW-24B, and WW-27B), core samples were collected prior to reaming the borehole. The cores show that the bedrock at the site is a dark gray to bluish gray siltstone. In general, the cores are slightly to moderately weathered and fractured. The bedrock boreholes were reamed using air-rotary methods to a depth of approximately 10 feet below the bedrock interface or the estimated groundwater level, whichever was lower.

The bedrock monitoring wells were constructed of 2-inch diameter PVC with 10 or 20 feet of 0.010-slot screen. WW-25B and WW-26B were constructed with 20-foot long screens to make sure that the well screen intersected water-bearing fractures. All other wells were screened over a ten-foot interval. The bedrock monitoring wells were finished with four-inch diameter protective steel casings that extend above the ground surface.

WELL INSTALLATION

Parratt Wolfe installed and developed 16 new wells. These wells, along with some previously existing wells, make up the monitoring well network (Figure 1). Monitoring well construction diagrams and boring logs are provided in Attachments A and B, respectively. A licensed surveyor surveyed the locations and measuring point elevations of the refurbished and new wells to an existing site datum. The survey data is summarized in Table 1.

As proposed, overburden monitoring well WW-17 was drilled south of the unnamed tributary, downgradient of the waste management area, and overburden monitoring well WW-5 was installed approximately 50 feet south of MW-4. Monitoring wells WW-1I and WW-2B were installed adjacent to existing wells MW-1 and MW-2. Monitoring well WW-3B, which is screened in the upper portion of saturated bedrock, replaced MW-3, which could not be located.

Seven of the new wells make up three sets of cluster wells (WW-23I/23B, WW-24I/24B, and WW-26/26I/26B). Monitoring well cluster WW-26/26I/26B was installed at the northern extent of the landfill and is comprised of an overburden, interface, and bedrock monitoring well. Monitoring well clusters WW-23I/23B and WW-24I/24B were

installed downgradient of MW-14 and are each comprised of an overburden/bedrock interface monitoring well and a bedrock monitoring well.

No overburden or interface wells were installed at WW-25B, WW-27B, or WW-28B. The clay in the overburden was either dry or did not yield enough water to warrant installing a well in this unit. WW-26 was installed and screened in this interval to determine if the overburden formation would yield water. The clay at WW-26 appeared to be the most saturated of any of the clay encountered at the site. Monitoring of this well over a two-week period after installation showed that the clay overburden was not yielding water (well WW-26 was dry after 14 days). As the overburden and bedrock interface were observed to not be saturated in borings for WW-28B, WW-27B, and WW-25B, overburden and weathered bedrock wells were not installed at these locations.

The groundwater elevations in several of the bedrock wells are at or above the elevation of the overburden/bedrock interface. This does not necessarily indicate that the overburden or weathered bedrock is saturated or that the watertable is at the elevation of the water in the bedrock well. The height of the water in a bedrock well is related to the hydraulic head at the depth at which the well is screened. The water levels in WW-25B, WW-27B, and WW-28B are just above the top of the screen but not as high as the bedrock interface. The water level in WW-26B is at the bedrock interface and there is appreciable water at the interface as shown in WW-26I. As mentioned above, there is no water in the overburden. The water levels in WW-23I and WW-23B are above the bedrock interface. The water level in WW-24B is approximately three feet above the top of the screen but well below the bedrock interface.

WELL DEVELOPMENT

Upon completion of well installation, Parratt Wolfe developed the wells in accordance with the original ESC Work Plan. Malcolm Pirnie observed the well development, and measured and recorded field parameters, including turbidity, pH, specific conductance, and temperature. The monitoring wells were developed by purging groundwater from the well with Whale ® and Waterra ® pumps with simultaneous surging. A surge block was used on most of the wells to expedite the development. Development was considered complete when a minimum of three borehole volumes of water had been removed and the field parameters (pH, specific conductance, and temperature) for two consecutive well volumes had stabilized. All wells were developed until three borehole volumes were purged or the well went dry. All well development fluids were contained in 55-gallon steel drums for disposal by RealCo. Many of the wells produced water that was turbid after three borehole volumes were purged. Well development logs are provided in Attachment C.

WELL REHABILITATION AND ABANDONMENT

Existing monitoring wells MW-10, MW-16, MW-16B were refurbished, which included replacing the protective casing and grout, well caps, and locks. MW-20B was scheduled to be refurbished because it was buried under re-grading material during the reclamation project. However, MW-20B was replaced with a new well (WW-20B) because it could not be located.

Parratt Wolfe abandoned three wells (MW-7, MW-12, and MW-13) in accordance with the NYSDEC Groundwater Monitoring Well Decommissioning Procedures (Malcolm Pirnie, Inc., October 1996). MW-3, MW-6, MW-8, and MW-15 could not be located and were therefore not abandoned. Monitoring wells MW-1 and MW-2 were not abandoned. These wells may be abandoned after assessing the water quality in the replacement wells at these locations.

If you have any questions or require additional information, please feel free to call me at (518) 786-7349.

Very truly yours,

MALCOLM PIRNIE, INC.

Daniel C. Lang
Project Hydrogeologist

jcf
Attachments
F:\PROJECT\3938014\DOC\park.doc

LEGEND

- TOPOGRAPHIC CONTOUR (JANUARY 2003)
- OLD LANDFILL AREA
- NEW LANDFILL AREA
- WELL IN MONITORING NETWORK
- WELL NOT IN MONITORING NETWORK

N.

APPROXIMATE SCALE

0' 150 300'

1" = 150'

LEACHATE COLLECTION BUILDING

SPRING STREET RD.

EXISTING 18"ø CULVERT INV. EL. 182.49

MALCOLM PIRNIE

REALCO. INCORPORATED
WATERVLIET, NEW YORK

POST-CLOSURE MONITORING WELL NETWORK

FIGURE 1

Table 1
Survey Data
Former RealCo Landfill
Watervliet, New York

WELL ID	NORTHING	EASTING	CASING	MEAS. POINT	GROUND	STICK-UP HEIGHT (FEET)
WW-01	990050.486202	663600.614132	84.99	84.90	82.89	2.01
WW-01I	990054.133361	663595.629223	85.46	85.20	83.47	1.73
WW-02	990662.200245	663566.845924	104.90	104.65	102.85	1.80
WW-02B	990644.710592	663568.138192	105.63	105.30	103.04	2.26
WW-03B	991067.332038	663327.159467	113.94	113.46	111.26	2.20
WW-04	990102.319732	662570.763467	201.83	201.60	200.37	1.23
WW-05	990024.390677	662592.173491	200.72	200.56	198.65	1.91
WW-10	990407.178331	662427.498343	212.59	212.25	209.86	2.39
WW-14	990654.962618	663571.394321	104.02	103.83	102.45	1.38
WW-16	990305.017618	663100.426329	162.15	161.62	159.13	2.49
WW-16B	990316.364366	663099.261529	163.48	163.08	160.64	2.44
WW-17	990196.913736	663041.869893	160.52	160.18	158.29	1.89
WW-20B	990270.450852	663688.803038	85.82	85.54	83.35	2.19
WW-21	989858.411802	663954.793452	69.17	68.88	67.30	1.58
WW-21B	989869.965854	663956.068771	69.04	68.85	67.45	1.40
WW-22	990175.141881	664122.592838	61.95	61.73	59.76	1.97
WW-22B	990178.040681	664113.083742	61.94	61.70	59.99	1.71
WW-23I	990778.236869	663592.392836	84.14	83.99	82.69	1.30
WW-23B	990767.977994	663591.054985	84.78	84.56	83.69	0.87
WW-24I	990243.208124	663921.523633	69.57	69.11	67.22	1.89
WW-24B	990257.858129	663920.864883	69.36	69.04	67.12	1.92
WW-25B	990439.400074	663437.139355	139.25	138.84	136.79	2.05
WW-26	991237.004505	662574.626102	194.73	194.53	192.30	2.23
WW-26I	991229.770995	662561.437913	195.30	194.99	192.99	2.00
WW-26B	991227.711187	662570.449398	195.42	195.26	193.41	1.85
WW-27B	991110.013778	662906.033157	162.46	161.72	160.93	0.79
WW-28B	991082.623668	663138.963690	151.16	150.86	148.84	2.02

All measurements are in feet relative to site datum.

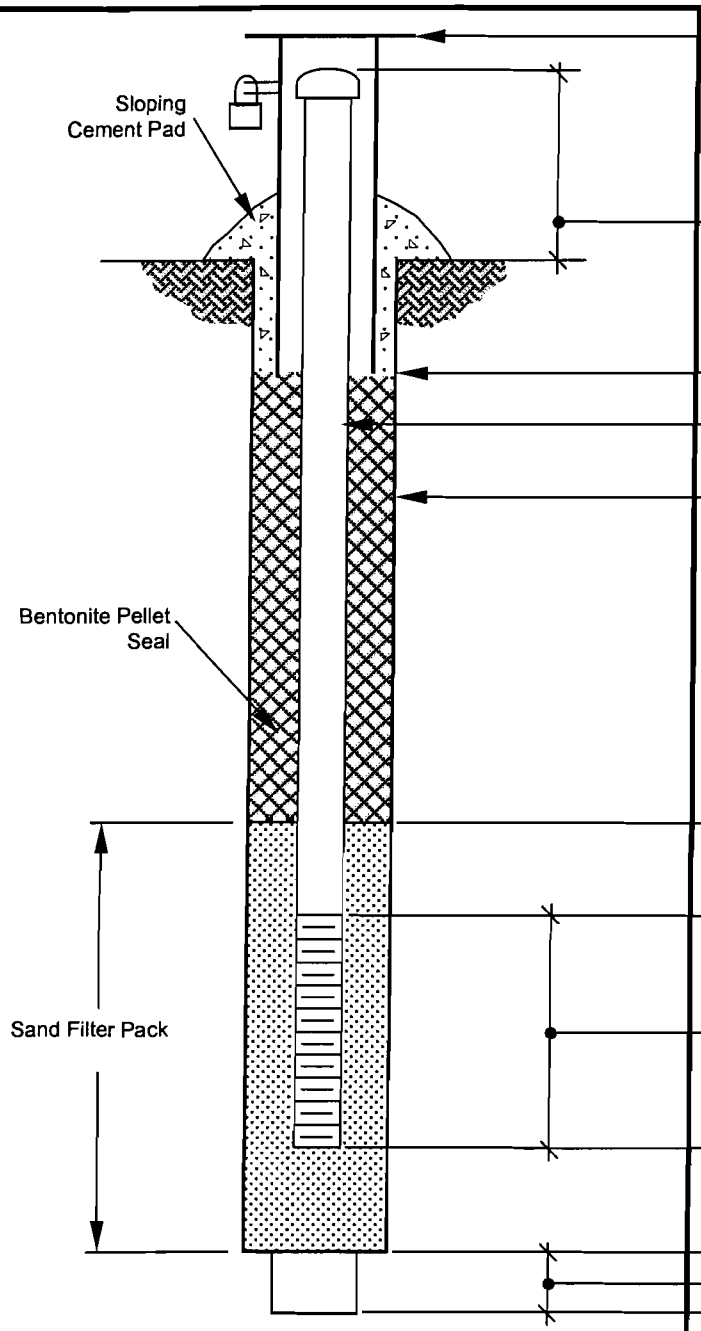
ATTACHMENT A

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-1I

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/12/03	8/15/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** A. Bobar		**Driller(s)** L. Pech
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 6.25" Auger, 3 7/8" Air Rotary
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked?	X Yes ___ No
Stick-Up	2.01'
Depth to Top of Grout/ Bottom of Cement	No Grout – Bentonite to 1.7' then pad
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Depth	3.7'
Depth	5.7'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	15.7'
Depth	15.7'
Backfill Material	Not applicable
Bottom of Borehole	15.7'

NOTE: DEPTHS ARE FEET BELOW GRADE

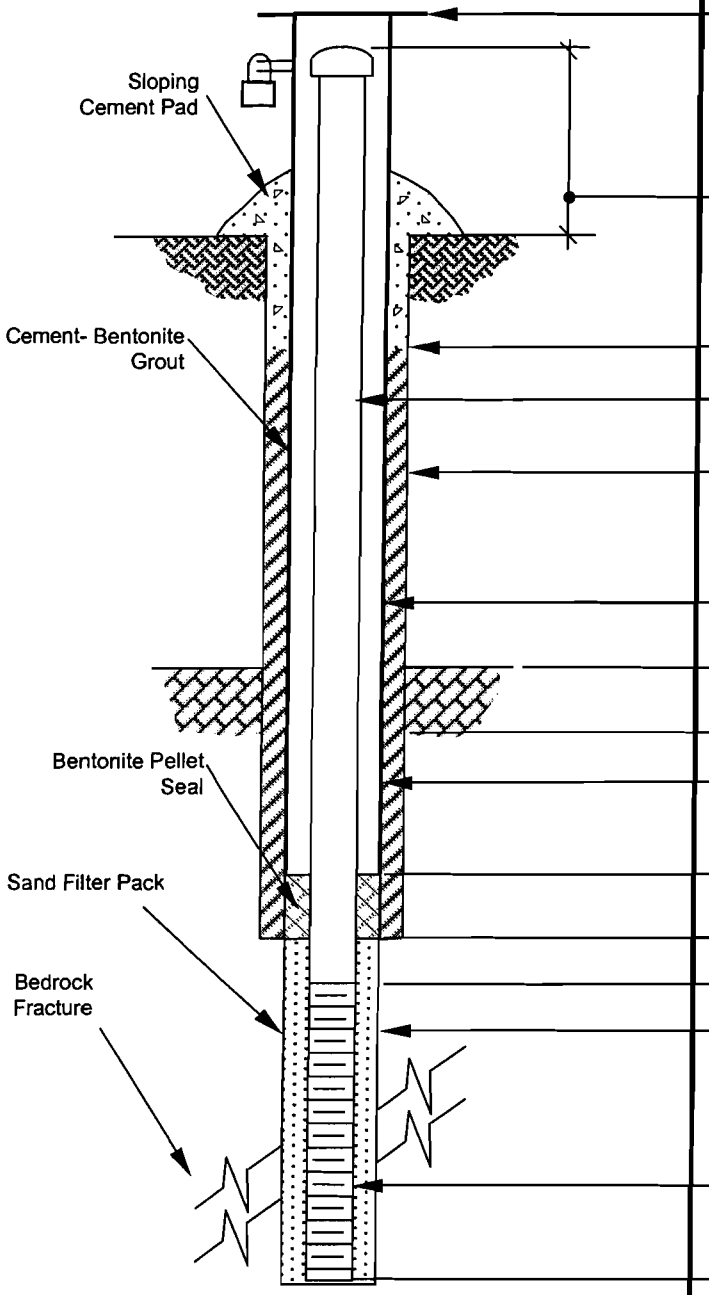
Not To Scale

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-2B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/12/03	9/3/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** A. Bobar, M. Flusche		**Driller(s)** L. Pech, M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 6.25" Auger, 3 7/8" Air Rotary, Wet Reaming
			Development Method(s) Whale Pump



NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

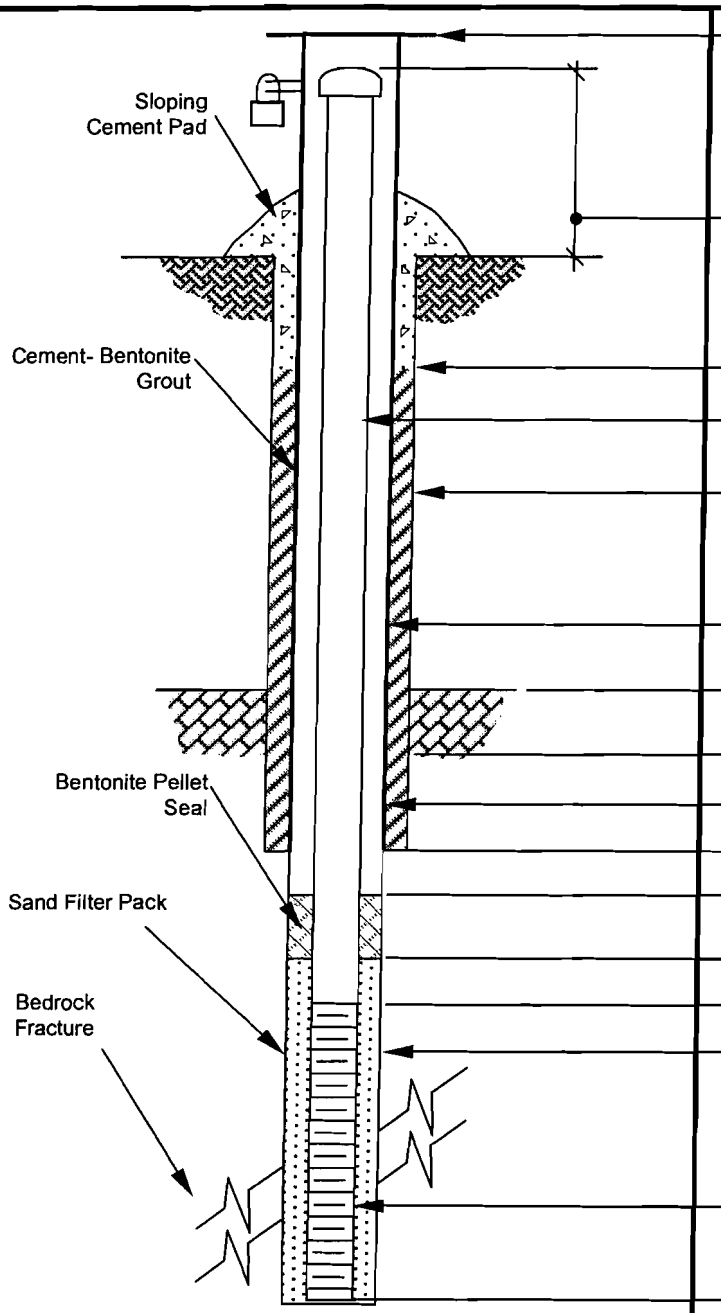
Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	2.26'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	31'-32'
Competent Rock Depth	35'
Rock Socket Diameter	4"
Depth	38'
Depth	40'
Depth	45'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Air Hammer to 49', 3 7/8" Roller Bit 55'
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	55'

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-3B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/18/03	8/19/03	Parratt Wolfe
Project No.	**Field Geologist**		**Driller(s)**
REALCO - 3938014	A. Bobar		L. Pech
Location			**Drilling Method(s)**
200 SPRING STREET, TOWN OF COLONIE, NEW YORK			6.25" Auger, 3 7/8" Air Rotary
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	2.20'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	16'
Competent Rock Depth	18'
Rock Socket Diameter	4"
Depth	23'
Depth	35'
Depth	41'
Depth	49'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Air Rotary
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	59'

NOTE: DEPTHS ARE FEET BELOW GRADE

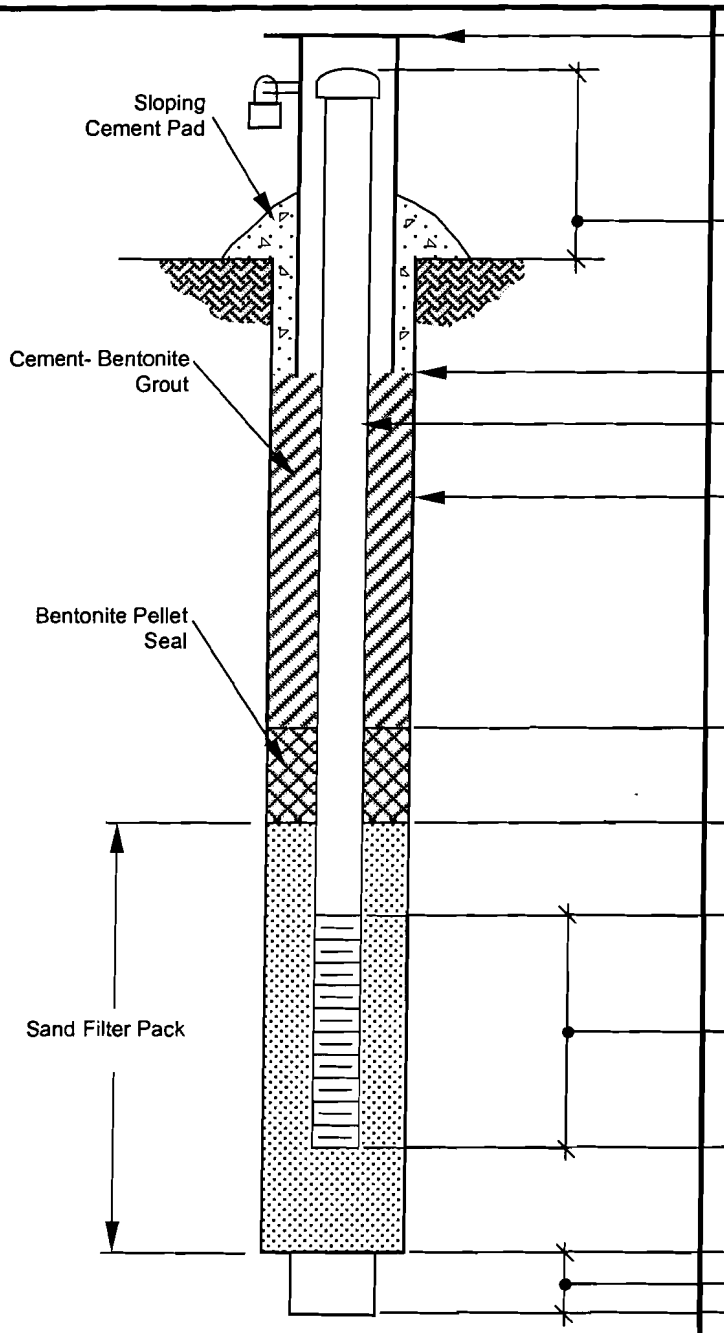
Not To Scale

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-5

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/9/03	9/9/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 4.25" Auger
			Development Method(s) Whale Pump



NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

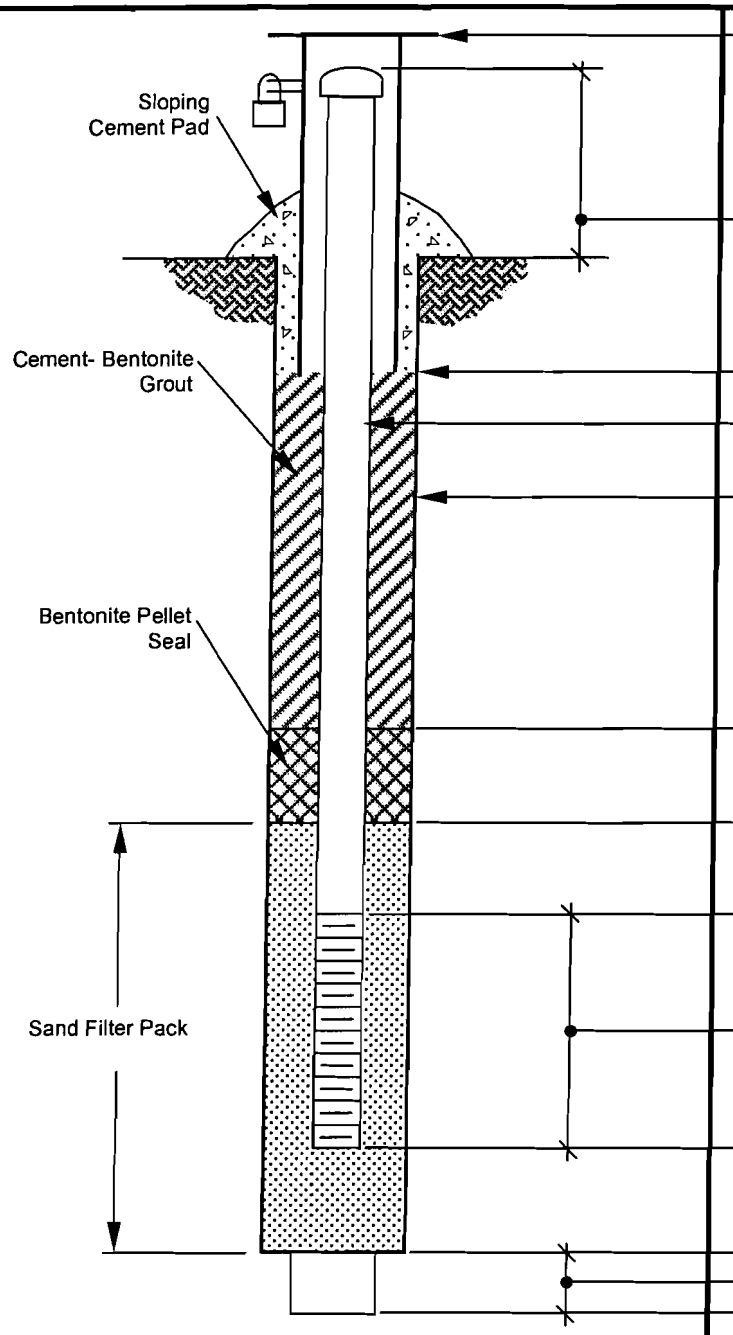
Size and Length of Lockable Protective Steel Casing	4"
Locked?	X Yes ___ No
Stick-Up	1.91'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	8"
Depth	31'
Depth	33'
Depth	35'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	45'
Depth	45'
Backfill Material	Not applicable
Bottom of Borehole	45'

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-17

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/8/03	9/8/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 4.25" Auger w/roller bit
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked?	X Yes ___ No
Stick-Up	1.89'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	8"
Depth	2'
Depth	4'
Depth	4.5'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	14.5'
Depth	14.5'
Backfill Material	Not applicable
Bottom of Borehole	14.5'

NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

MALCOLM PIRNIE

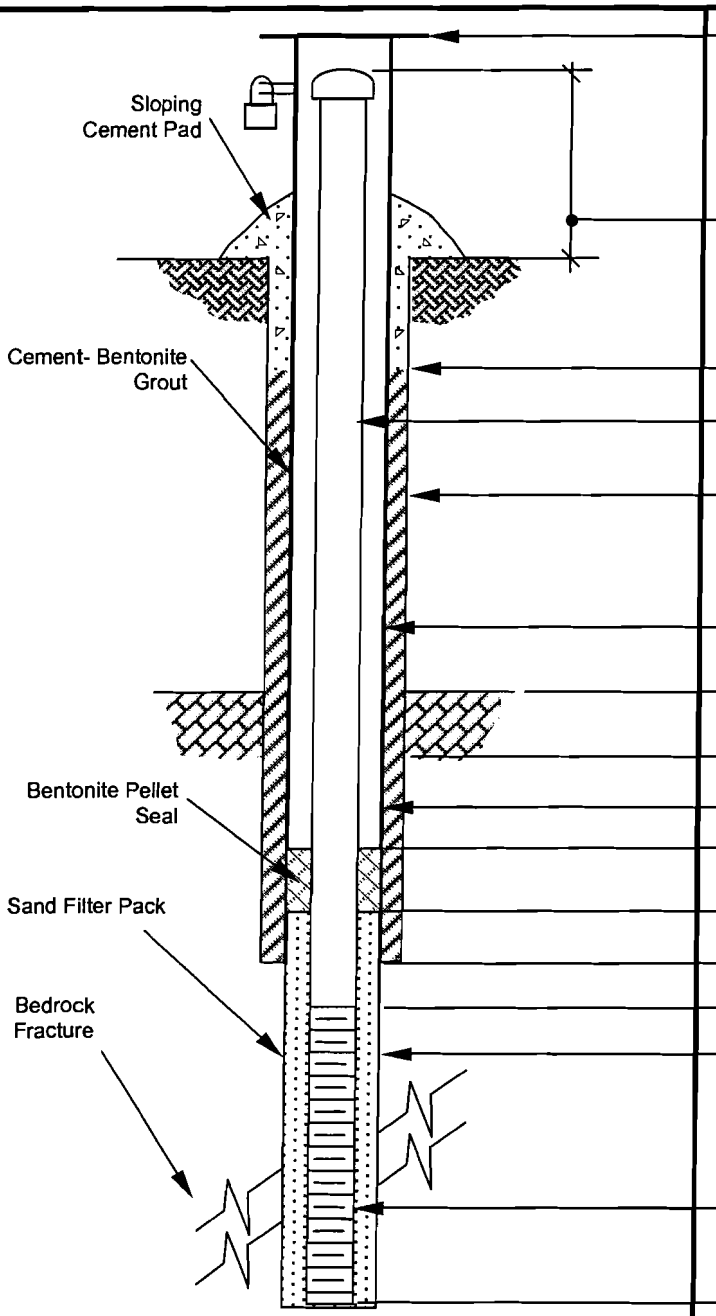
Bedrock Monitoring Well Sheet

WELL NO. WW-20B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/12/03	9/16/03	Parratt Wolfe

Project No.	Field Geologist	Driller(s)
REALCO - 3938014	K. Stahle	M. Marshall

Location	Drilling Method(s)
200 SPRING STREET, TOWN OF COLONIE, NEW YORK	6.25" Auger, 3 7/8" Air Rotary
	Development Method(s): Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	2.19'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	13'
Competent Rock Depth	14'
Rock Socket Diameter	4"
Depth	17.5'
Depth	19.5'
Depth	20'
Depth	22'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Roller Bit
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	32'

NOTE: DEPTHS ARE FEET BELOW GRADE

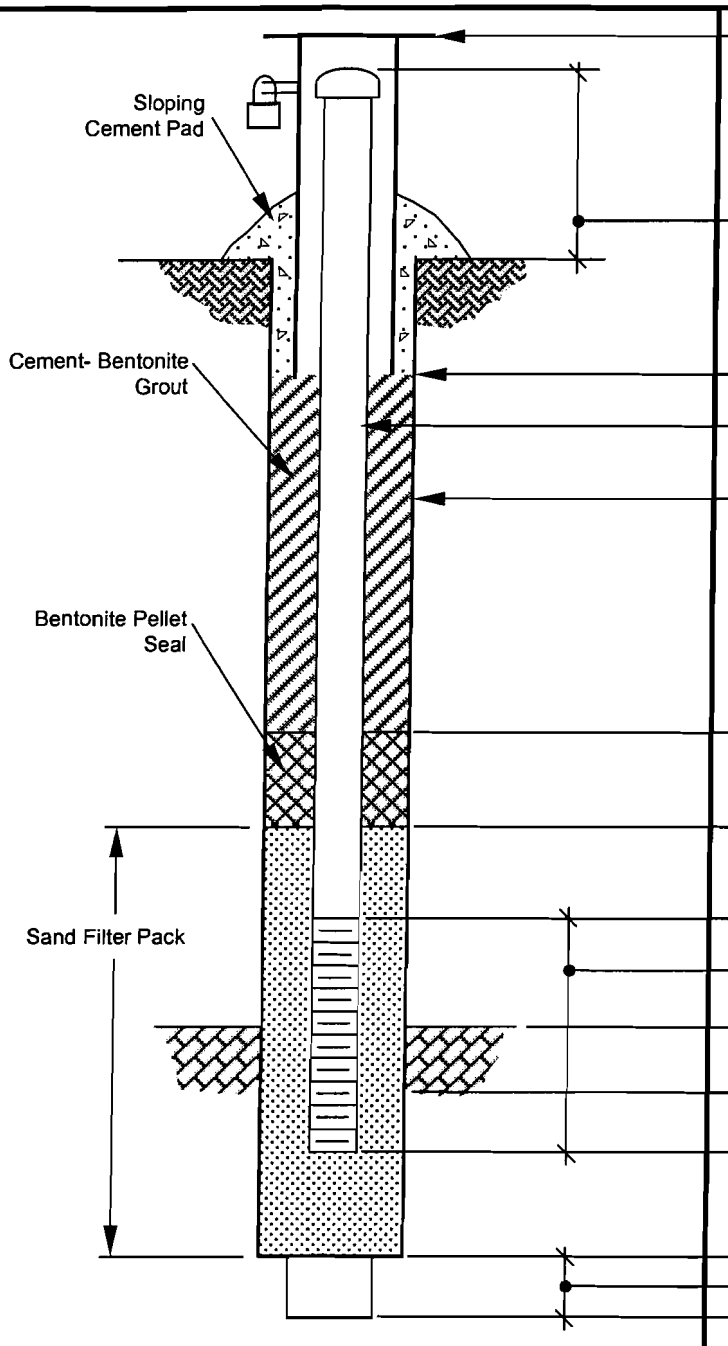
Not To Scale

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-23I

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/14/03	8/14/03	Parratt Wolfe
Project No.	**Field Geologist**		**Driller(s)**
REALCO - 3938014	A. Bobar		L. Pech
Location			**Drilling Method(s)**
200 SPRING STREET, TOWN OF COLONIE, NEW YORK			6.25" Auger
			Development Method(s)
			Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked?	x Yes ___ No
Stick-Up	1.30'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Depth	16'
Depth	18'
Depth	20'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Weathered Rock Depth	25'
Competent Rock Depth	27.5'
Depth	30'
Depth	30'
Backfill Material	Not applicable
Bottom of Borehole	30'

NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

MALCOLM PIRNIE

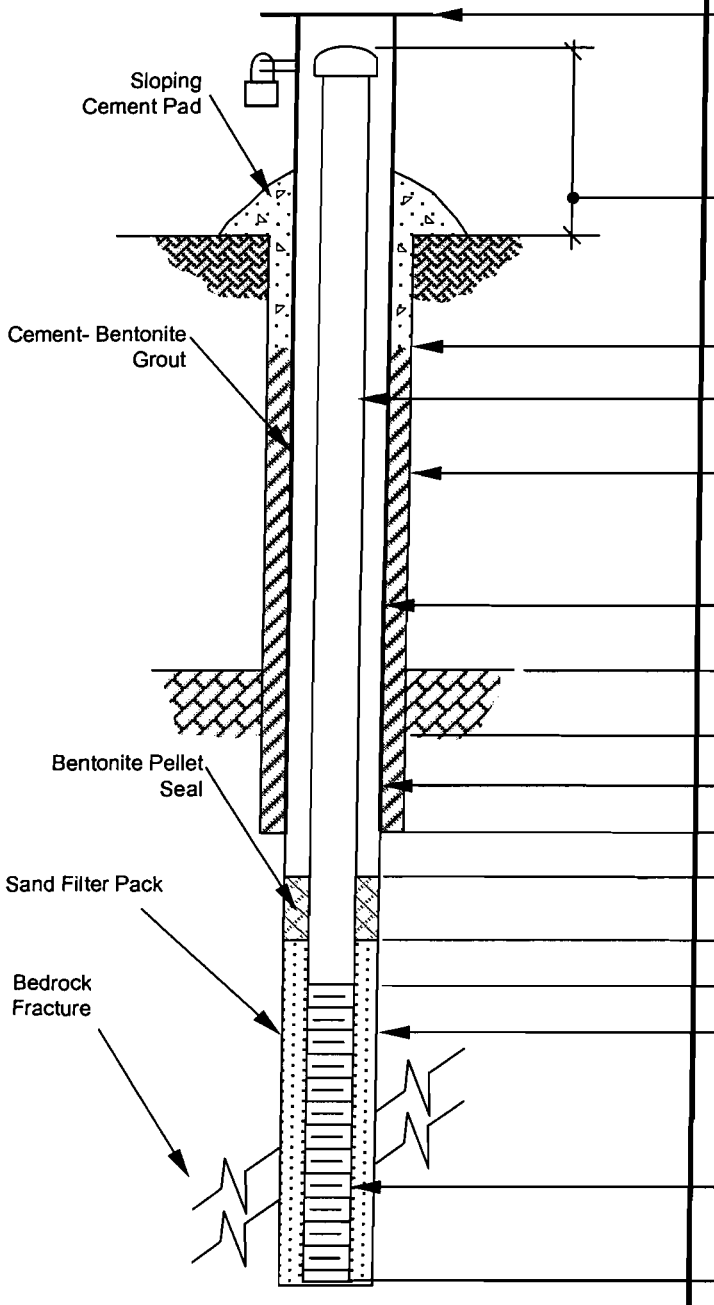
Bedrock Monitoring Well Sheet

WELL NO. WW-23B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/13/03	8/14/03	Parratt Wolfe

Project No.	Field Geologist	Driller(s)
REALCO - 3938014	A. Bobar	L. Pech

Location	Drilling Method(s)
200 SPRING STREET, TOWN OF COLONIE, NEW YORK	6.25" Auger, 3 1/8" Core
	Development Method(s): Whale Pump



- Size and Length of Lockable Protective Steel Casing: 4"
- Locked? X Yes ___ No
- Stick-Up: 0.87"
- Depth to Top of Grout/ Bottom of Cement: Unknown
- Riser Diameter and Material: 2" pvc
- Borehole Diameter: 10"
- Procasing Diameter: 4"
- Weathered Rock Depth: 25.75'
- Competent Rock Depth: 26.5'
- Rock Socket Diameter: 4"
- Depth: 31.5'
- Depth: 33'
- Depth: 37'
- Depth: 40.3'
- Hole Diameter (Core, Roller Bit, Hammer ?): 3 1/8" Core
- Screen Diameter & Type: 2" pvc 0.010" Slot
- Depth: 50.3'

NOTE: DEPTHS ARE FEET BELOW GRADE

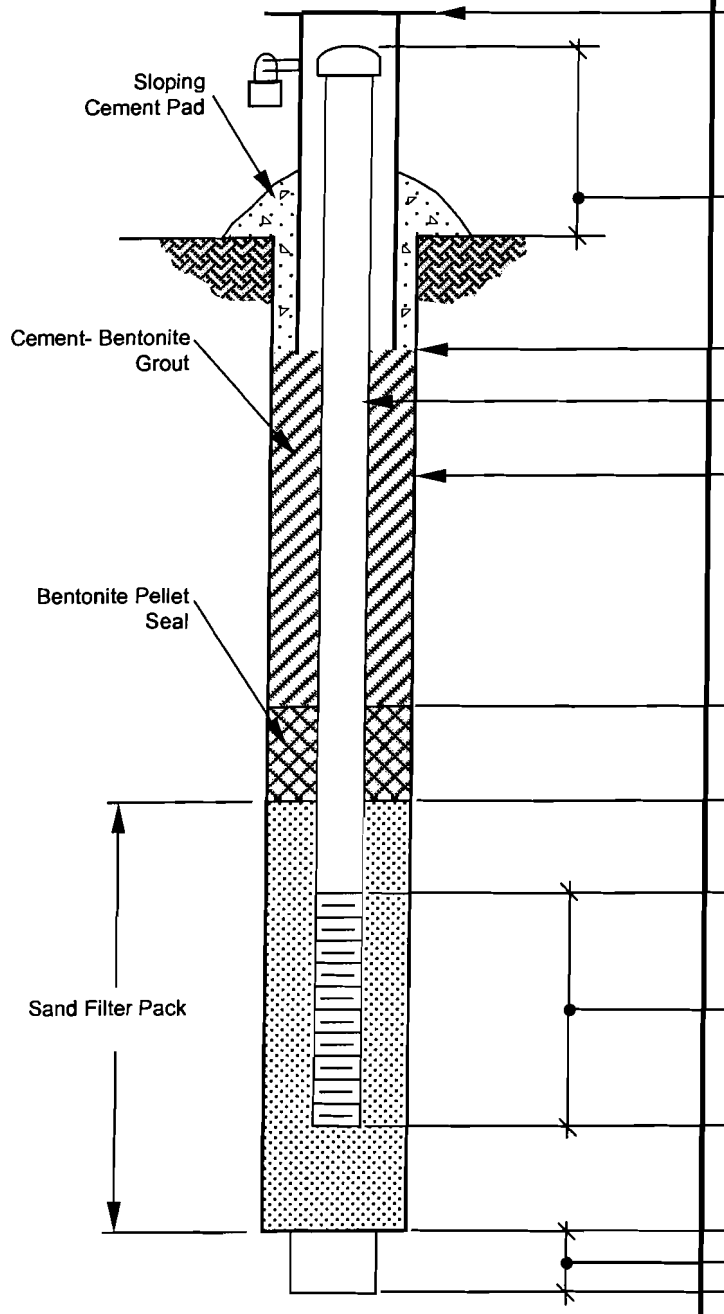
Not To Scale

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-24I

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/10/03	9/11/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 4.25" Auger
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	1.89'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	8"
Depth	21'
Depth	23'
Depth	25'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	35'
Depth	35'
Backfill Material	Not applicable
Bottom of Borehole	35'

NOTE: DEPTHS ARE FEET BELOW GRADE

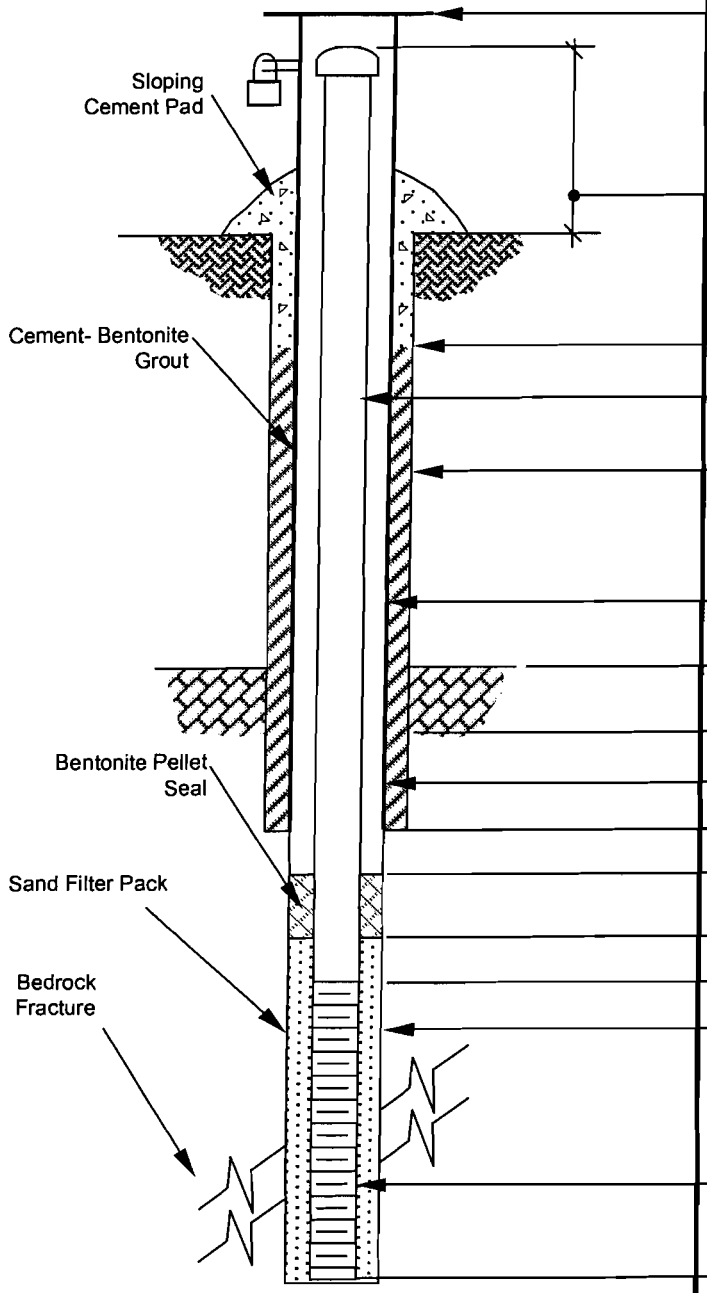
Not To Scale

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-24B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/9/03	9/15/03	Parratt Wolfe
Project No.	**Field Geologist**		**Driller(s)**
REALCO - 3938014	M. Flusche, K. Stahle		M. Marshall
Location			**Drilling Method(s)**
200 SPRING STREET, TOWN OF COLONIE, NEW YORK			6.25" Auger, 3 7/8" Air Rotary, 3 1/8" Core
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	1.92'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	32'
Competent Rock Depth	35'
Rock Socket Diameter	4"
Depth	40'
Depth	45'
Depth	48'
Depth	50'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 1/8" Core
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	60'

NOTE: DEPTHS ARE FEET BELOW GRADE

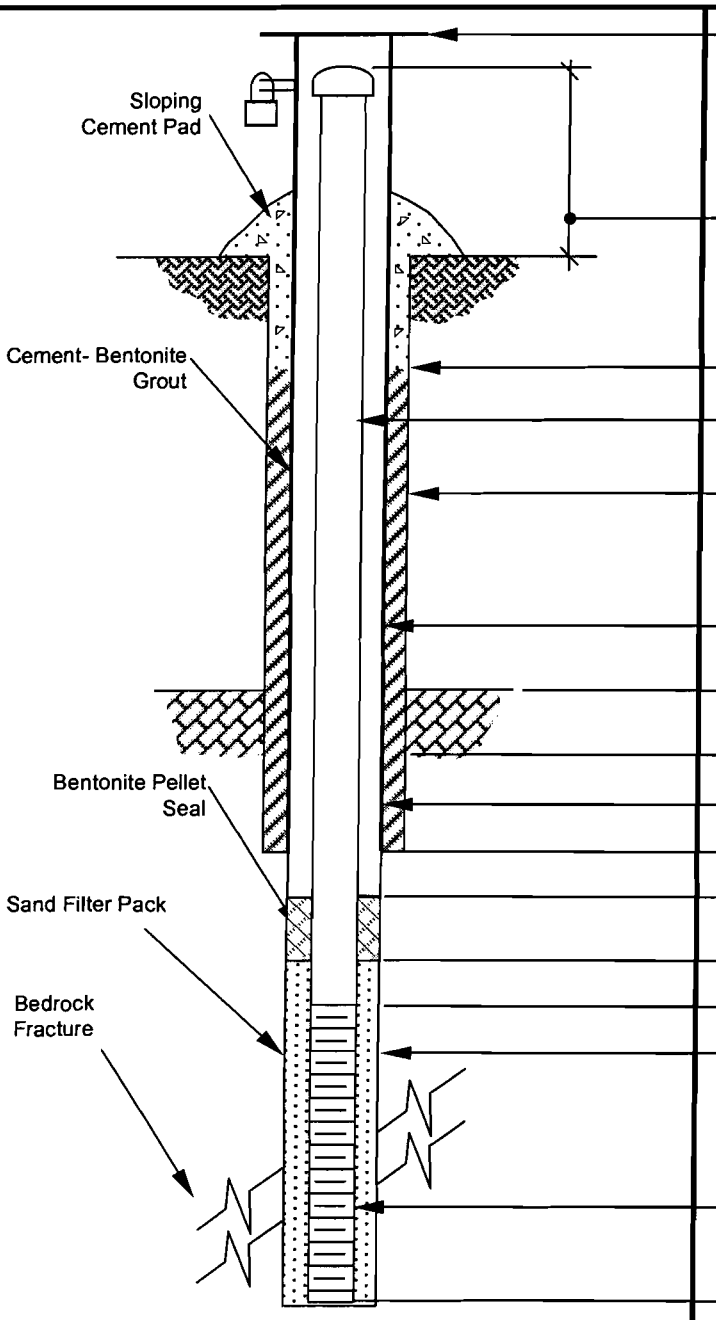
Not To Scale

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-25B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	9/4/03	9/8/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 6.25" Auger, 3 7/8" Air Rotary
			Development Method(s) Watara Pump



NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

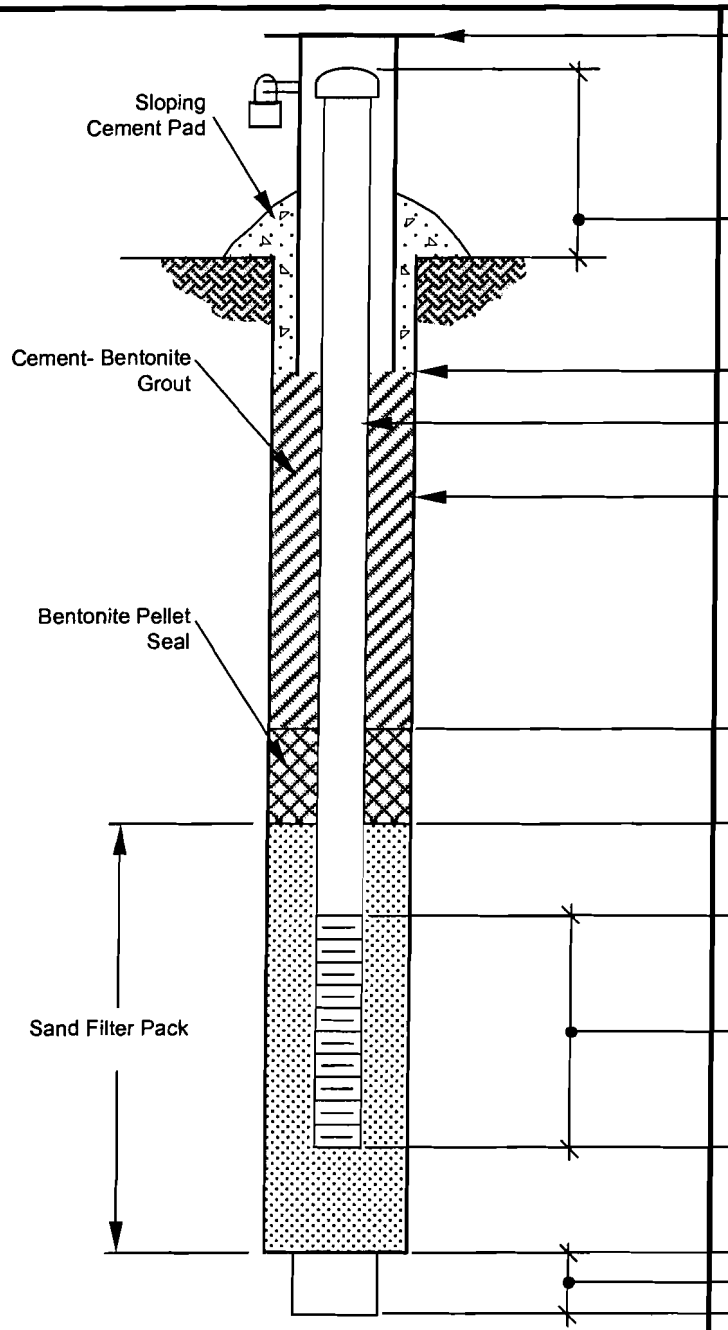
Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	2.05'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	36'
Competent Rock Depth	42'
Rock Socket Diameter	4"
Depth	47'
Depth	71.5'
Depth	75'
Depth	78'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Air Rotary
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	98'

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-26

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/27/03	8/27/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** L. Pech
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 4.25" Auger w/roller bit
			Development Method(s) N/A



NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

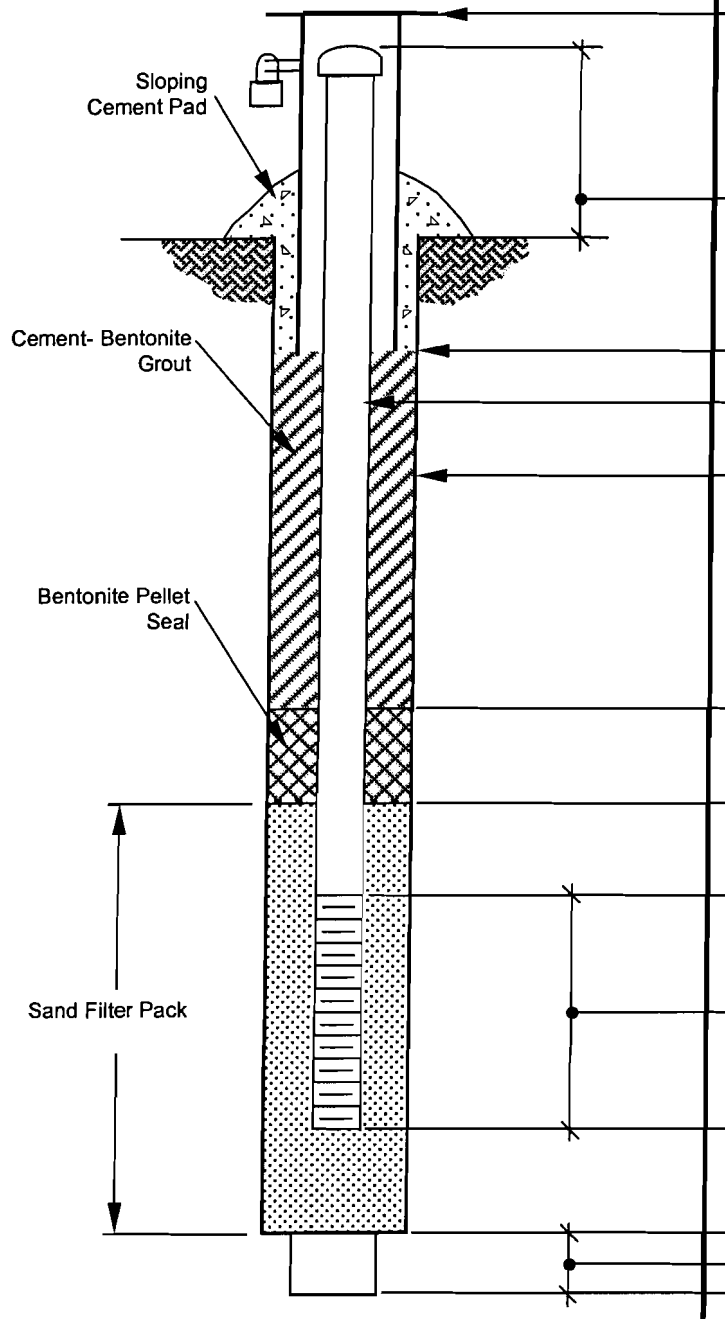
Size and Length of Lockable Protective Steel Casing	4"
Locked?	X Yes ___ No
Stick-Up	2.23'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	8"
Depth	31.5'
Depth	33.5'
Depth	35.5'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	45.5'
Depth	45.5'
Backfill Material	Not applicable
Bottom of Borehole	45.5'

MALCOLM PIRNIE

Overburden Monitoring Well Sheet

WELL NO. WW-26I

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/29/03	9/2/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 4.25" Auger to 53.5', 3 7/8" Roller Bit to 55'
			Development Method(s) Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked?	X Yes ___ No
Stick-Up	2.00'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	8"
Depth	40'
Depth	42'
Depth	44.5'
Screen Diameter, Slot Size and Material	2" pvc 0.010" Slot
Depth	54.5'
Depth	55'
Backfill Material	Not applicable
Bottom of Borehole	55'

NOTE: DEPTHS ARE FEET BELOW GRADE

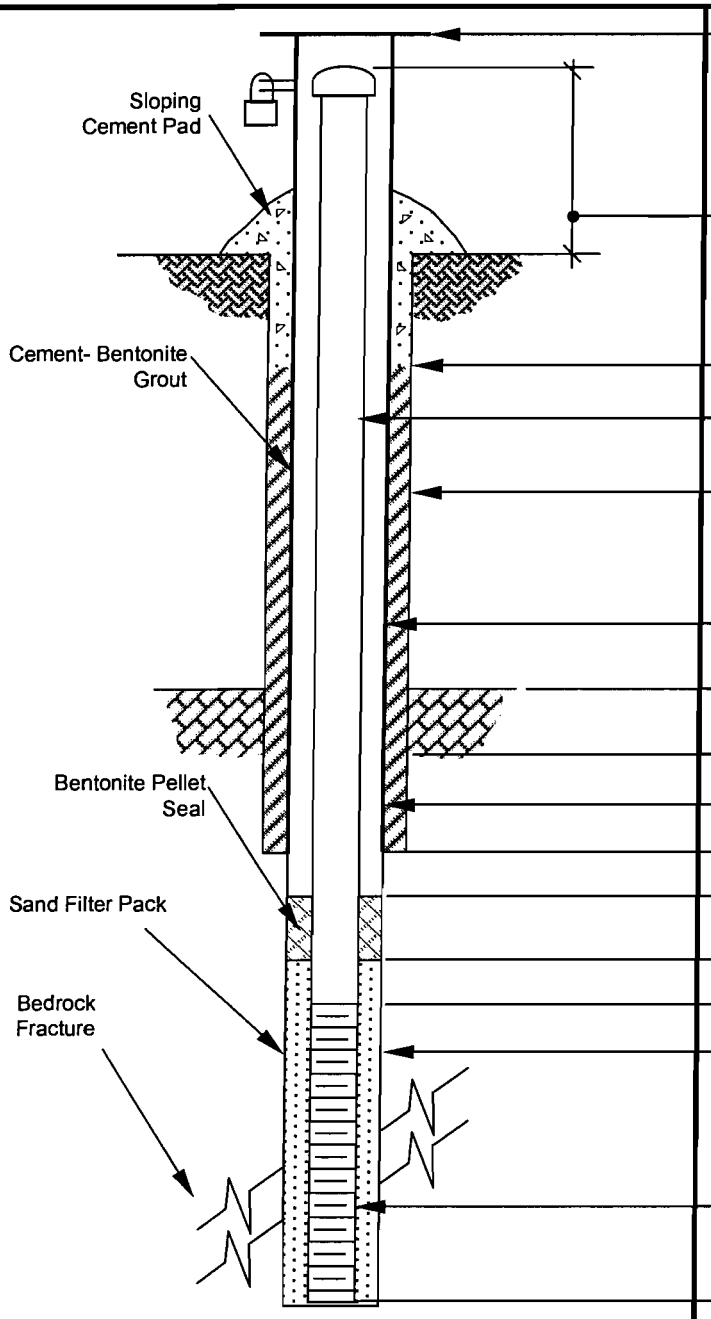
Not To Scale

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-26B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/25/03	8/29/03	Parratt Wolfe
Project No. REALCO - 3938014	**Field Geologist** M. Flusche		**Driller(s)** L. Pech, M. Marshall
Location 200 SPRING STREET, TOWN OF COLONIE, NEW YORK			**Drilling Method(s)** 6.25" Auger, 3 7/8" Air Rotary
			Development Method(s) Watara Pump



NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

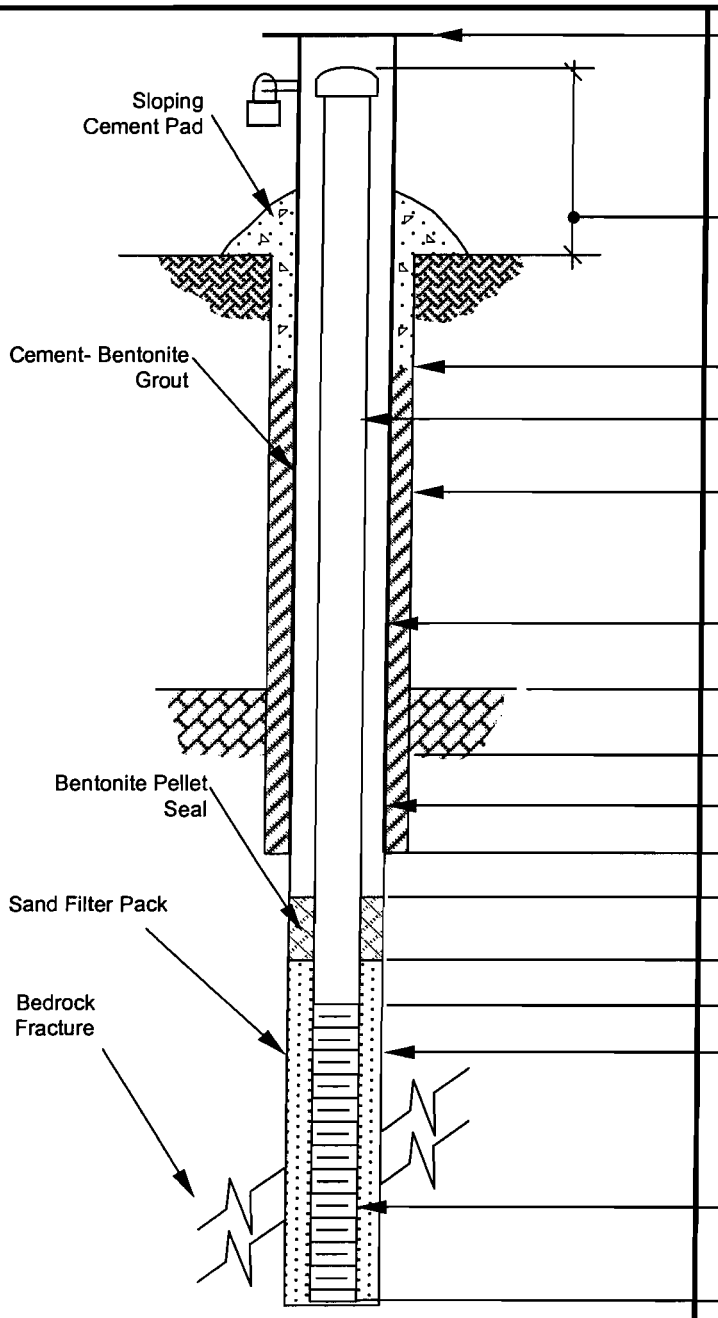
Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	1.85'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	42'-45'
Competent Rock Depth	53.5
Rock Socket Diameter	4"
Depth	58.5'
Depth	73'
Depth	77'
Depth	80'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Roller Bit
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	100'

MALCOLM PIRNIE

Bedrock Monitoring Well Sheet

WELL NO. WW-27B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/20/03	8/22/03	Parratt Wolfe
Project No.	**Field Geologist**		**Driller(s)**
REALCO - 3938014	A. Bobar, M. Flusche		L. Pech, M. Marshall
Location			**Drilling Method(s)**
200 SPRING STREET, TOWN OF COLONIE, NEW YORK			6.25" Auger, 3 1/8" Core
			Development Method(s)
			Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	0.79'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	16'
Competent Rock Depth	22'
Rock Socket Diameter	4"
Depth	26.5'
Depth	50.5
Depth	53.5'
Depth	56'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 1/8" Core
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	66'

NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

MALCOLM PIRNIE

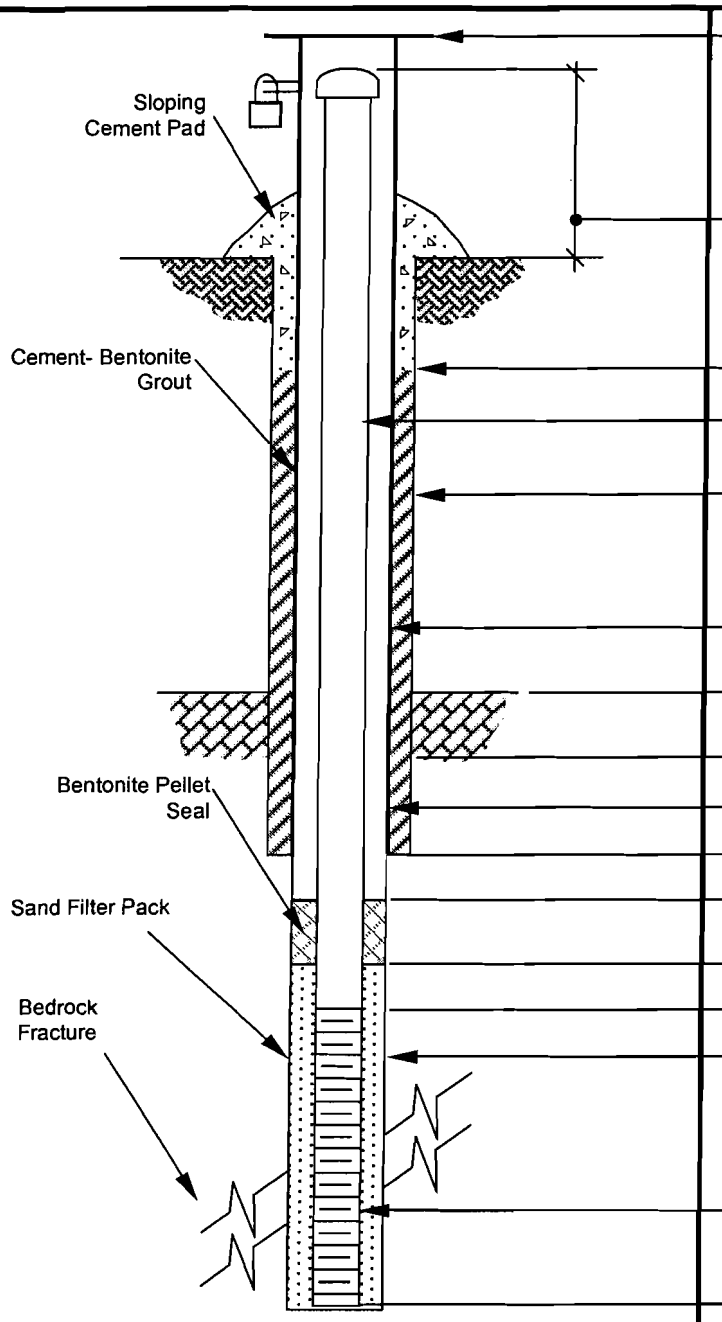
Bedrock Monitoring Well Sheet

WELL NO. WW-28B

Project	Start Date	End Date	Drilling Co.
FMR AL-TECH LF P-C MWN COMPLETION	8/19/03	9/3/03	Parratt Wolfe

Project No.	Field Geologist	Driller(s)
REALCO - 3938014	M. Flusche, A. Bobar	L. Pech, M. Marshall

Location	Drilling Method(s)
200 SPRING STREET, TOWN OF COLONIE, NEW YORK	6.25" Auger, 3 7/8" Air Hammer
	Development Method(s): Whale Pump



Size and Length of Lockable Protective Steel Casing	4"
Locked? X Yes ___ No	
Stick-Up	2.02'
Depth to Top of Grout/ Bottom of Cement	Unknown
Riser Diameter and Material	2" pvc
Borehole Diameter	10"
Procasing Diameter	4"
Weathered Rock Depth	30'
Competent Rock Depth	31'
Rock Socket Diameter	4"
Depth	36'
Depth	60'
Depth	63'
Depth	65'
Hole Diameter (Core, Roller Bit, Hammer ?)	3 7/8" Air Hammer
Screen Diameter & Type	2" pvc 0.010" Slot
Depth	75'

NOTE: DEPTHS ARE FEET BELOW GRADE

Not To Scale

ATTACHMENT B

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-1I

PROJECT	RealCo MWN	LOCATION	Watervliet, NY		SHEET	1 OF 1
CLIENT					PROJECT No.	3938014
DRILLING CONTRACTOR	Parratt Wolfe				MEAS. PT. ELEV.	85.20
PURPOSE	Monitoring Well Installation				GROUND ELEV.	83.5
WELL MATERIAL	2" PVC				DATUM	Site
DRILLING METHOD(S)	HSA, Air Rotary		SAMPLE	CORE / CASING	DATE STARTED	8/11/03
DRILL RIG TYPE	Drill Rig	TYPE			DATE FINISHED	8/15/03
GROUND WATER DEPTH	9.5'	DIA.	"		DRILLER	L. Pech
MEASURING POINT		WEIGHT	#		PIRNIE STAFF	A. Bobar
DATE OF MEASUREMENT		FALL	"			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2					No samples collected.		1.7	
4							3.7	
6					Competent rock.	77.5 / 6.0		
8								
10								
12								
14							15.7	

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-2B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **3**	
CLIENT					PROJECT No. **3938014**	
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **105.30**	
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **103.0**	
WELL MATERIAL **2" PVC**					DATUM **Site**	
DRILLING METHOD(S) **HSA, Air Rotary**		SAMPLE	CORE	CASING	DATE STARTED **8/12/03**	
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **9/3/03**	
GROUND WATER DEPTH **45.4'**	DIA.	"			DRILLER **LP and MM**	
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **AB and MAF**	
DATE OF MEASUREMENT	FALL	**30"**				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6	0.33	5 3 4 4			Brown; Silt and clay with some find gravel, little to trace very fine sand; Stiff; Low plasticity; Dry.	96.0 7.0		
8								
10	0.5	6 5 6 5			Brown; Silt and clay with occasional fine to very fine organic material; Firm; Low-medium plasticity; Dry-moist.	92.0 11.0		
12								
14	0.17	3 4 5 5			Brown; Clay and silt (probably sluff) with pulverized and heavily weathered shale fragments; Dry.	87.0 16.0		Poor recovery
16								
18								
		6 5			Brown; Clay and silt; Occasional blue/gray silty partings; Soft;			

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-2B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
	1.92	5 4			Medium plasticity; Moist-damp.	82.0 21.0		
22								
24		5 8			Brown; Clay and silt; Soft; Medium to low plasticity; Moist-damp.	78.0		
		9			Gray/blue; Clay with silt; Soft; Medium plasticity; Moist.	25.0 77.0		
26						26.0		
28								
30					Gray/blue; Clay with some silt; Soft; Plastic; Wet to moist.	72.0		
					Weathered rock.	31.0 71.0		
32						32.0		
34								
						68.0		
					Competent rock; Bluish gray; Siltstone; Angular cuttings.	35.0		
36								
38								38.0
40								40.0
42								
44								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-2B
PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**	SHEET **3** OF **3**
CLIENT		PROJECT No. **3938014**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
48								Water first encountered @ 49' bgs while drilling.
50								
52								
54						55.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-3B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **3**	
CLIENT					PROJECT No. **3938014**	
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **113.46**	
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **111.3**	
WELL MATERIAL **2" PVC**					DATUM **Site**	
DRILLING METHOD(S) **HSA, Air Rotary**		SAMPLE	CORE	CASING	DATE STARTED **8/18/03**	
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **8/19/03**	
GROUND WATER DEPTH **36.0'**	DIA.	"			DRILLER **L. Pech**	
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **A. Bobar**	
DATE OF MEASUREMENT	FALL	**30"**				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4	0.17	16 16 14 7			Clayey/silty fill material; Dry.	105.3 6.0		
6								
8								
10	2	5 7 8 6			Mottled gray/brown silt and clay with occasional fine gravel; Dry to 9.9' bgs then brown clay and silt; Soft; Low-med plasticity; Moist.	100.3 11.0		
12								
14	2	11 9 30			Brown; Clay and silt; Soft; Medium plasticity; Moist.	95.8		
16		R			Heavily weathered rock; Dry.	15.5 95.3 16.0		
18					Competent rock; Bluish gray; Siltstone; Angular cuttings.	93.3 18.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-3B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
22								
24								
26								
28								
30								
32								
34								
36							35.0	
38								
40								
42							41.0	
44								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-3B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
48								
50								
52								Water first encountered @ 53' bgs when drilling in bedrock
54								
56								
58						52.3 / 59.0	59.0	

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-5

PROJECT **RealCo MWN**		LOCATION **Watervliet, NY**				SHEET **1** OF **2**
CLIENT						PROJECT No. **3938014**
DRILLING CONTRACTOR	**Parratt Wolfe**					MEAS. PT. ELEV. **200.56**
PURPOSE	**Monitoring Well Installation**					GROUND ELEV. **198.7**
WELL MATERIAL	**2" PVC**					DATUM **Site**
DRILLING METHOD(S)	**Hollow Stem Auger**		SAMPLE	CORE	CASING	DATE STARTED **9/9/03**
DRILL RIG TYPE	**Drill Rig**	TYPE				DATE FINISHED **9/9/03**
GROUND WATER DEPTH	**21.0'**	DIA.	"			DRILLER **M. Marshall**
MEASURING POINT		WEIGHT	**140 #**			PIRNIE STAFF **M. Flusche**
DATE OF MEASUREMENT		FALL	**30"**			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6	0	4 6 9 9			No recovery.	191.7 7.0		Rocks and gravel in first 5 feet. Some dark brown clay came up out of augers. Encountered softer light brown clay at ~6-7' bgs.
8								
10	1.5	3 3 8 10			Brown; Clay and silt; Firm; Low plasticity; Dry.	186.7 12.0		
12								
14								
16	1	9 18 20 16			Brown; Clay and silt with some sand and gravel, no sand and gravel in top 6 inches; Firm; Medium plasticity; Dry.	181.7 17.0		
18								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-5
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 2
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
	1.67	Weight Weight 4 4			Brown; Clay and silt with 2 inch gray clay layer at 20.2' bgs; Firm; Medium plasticity to plastic; Dry-slightly moist.	176.7		▼
22						22.0		
24								
	2	1 2 2 1			Brown; Clay and silt; Firm; Plastic; slightly moist.	173.2 25.5		
26					Gray; Clay; Firm; Medium plasticity to plastic; Moist.	171.7		
						27.0		
28								
30	2	Weight Weight Weight 3			Gray; Clay; Firm; Medium plasticity; Wet.			31.0
						166.7		
32						32.0		33.0
34								
36	2	Weight 1 2 2			Gray; Clay; Firm; Medium plasticity; Wet.	161.7		
						37.0		
38								
40	0	1 1 3 3			No recovery.			Encountered water while drilling @ 40' bgs.
						156.7		
42						42.0		
44								
						153.7		45.0
						45.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-17

PROJECT **RealCo MWN**		LOCATION **Watervliet, NY**			SHEET **1** OF **1**	
CLIENT					PROJECT No. **3938014**	
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **160.18**	
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **158.3**	
WELL MATERIAL **2" PVC**					DATUM **Site**	
DRILLING METHOD(S) **Hollow Stem Auger**		SAMPLE	CORE	CASING	DATE STARTED **9/8/03**	
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **9/8/03**	
GROUND WATER DEPTH **6.5'**	DIA.	"			DRILLER **M. Marshall**	
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **M. Flusche**	
DATE OF MEASUREMENT	FALL	**30"**				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
2							2.0	
4							4.0	
6	0.5	4 2 4 3			Brown; Clay and silt; Bottom inch is a tree root; Firm; Low plasticity; Dry-moist.	151.3 7.0		
8								
10	2	3 3 3 3			Brown; Clay and silt and trace organic material; Firm; Medium plasticity to plastic; Wet-moist.	146.3 12.0		
12								
14							14.5	
16	0.5	10 14 2 6			Gray; Clay with trace silt, sand, and gravel; Firm; Medium plasticity; Wet.	141.3 17.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-20B

PROJECT	RealCo MWN	LOCATION	Watervliet, NY			SHEET 1 OF 2
CLIENT						PROJECT No. 3938014
DRILLING CONTRACTOR	Parratt Wolfe					MEAS. PT. ELEV. 85.54
PURPOSE	Monitoring Well Installation					GROUND ELEV. 83.4
WELL MATERIAL	2" PVC					DATUM Site
DRILLING METHOD(S)	HSA, Air Rotary		SAMPLE	CORE	CASING	DATE STARTED 9/12/03
DRILL RIG TYPE	Drill Rig	TYPE				DATE FINISHED 9/16/03
GROUND WATER DEPTH	18.2'	DIA.	"			DRILLER M. Marshall
MEASURING POINT		WEIGHT	#			PIRNIE STAFF K. Stahle
DATE OF MEASUREMENT		FALL	"			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2					No sample collected.			
4								
6								
8								
10								
12								
14					Competent rock.	69.4 / 14.0		
16								
18							17.5 ▼ 19.5	

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-20B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 2
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
22								
24								
26								
28								
30								
32						32.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-23B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **3**	
CLIENT					PROJECT No. **3938014**	
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **84.56**	
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **83.7**	
WELL MATERIAL **2" PVC**					DATUM **Site**	
DRILLING METHOD(S) **HSA, Core**		SAMPLE	CORE	CASING	DATE STARTED **8/13/03**	
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **8/14/03**	
GROUND WATER DEPTH **19.8'**	DIA.	"			DRILLER **L. Pech**	
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **A. Bobar**	
DATE OF MEASUREMENT	FALL	**30"**				

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4	1.5	2 4 6 9			Mottled gray/brown silt and clay; Soft-firm/ Low plasticity; Dry-damp.	77.7 6.0		
6								
8					Brown silt and clay; Soft; Low-medium plasticity; Damp-moist.			
10	1.33	2 2 2 3				72.7 11.0		Switched from HSA to air rotary with 6 1/4" roller bit.
12								
14	1.83	5 10 14 14			Mottled gray/brown clay and silt; soft-med. firm; low-med plasticity; Damp.	67.7 16.0		
16								
18								
		3 4			Mottled gray/brown clay and silt; soft-med. firm; low-med plasticity; Damp.	64.2 19.5		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-23B
PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**	SHEET **2** OF **3**
CLIENT		PROJECT No. **3938014**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
	2	4 5			Blue/gray clay and silt with 3-inch silt layer; Soft; Low to medium plasticity (silt-low plasticity); Moist-wet.	62.7 21.0		Water first encountered @ 21' bgs while drilling.
22	2	Weight Weight 2 2			Blue/gray silt and clay; Soft; Medium plasticity to plastic; Wet.	60.7 23.0		
24	1	8 13 23 50/0.2			Weathered rock; Rock appears competant at 25.75' bgs; Material in end of spoon not as fragmented and fine.	57.7 26.0		Hit split spoon refusal @ 25.75' bgs.
28								
30						52.2		
32					Dark gray to dark blue/gray; Siltstone; Medium weathered to sound; Few weathered fractures; Hardness ~4-5.	31.5	33.0	92% Rec; 0.72 RQD
34						48.4		
36					Dark gray to dark blue/gray; Siltstone; Sound; Few weathered fractures; Hardness ~4-5.	35.3	37.0	92% Rec; 0.97 RQD
38								
40						43.4		
42					Dark gray; Siltstone; Medium weathered to sound; Few natural fractures; Hardness ~4-5; Some cleavage faces show shiny almost vitrious luster.	40.3		92% Rec; 0.80 RQD
44						38.4		
					Dark gray; Siltstone; Sound with few	45.3		92% Rec; 0.83 RQD

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-23B
PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**	SHEET **3** OF **3**
CLIENT		PROJECT No. **3938014**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
48					natural fractures; Hardness ~4-5.			
50						33.4 50.3	50.3	

MALCOLM PIRNIE — TEST BORING LOG — BORING No. WW-24B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **3**
CLIENT					PROJECT No. **3938014**
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **69.04**
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **67.1**
WELL MATERIAL **2" PVC**					DATUM **Site**
DRILLING METHOD(S) **HSA, Air Rotary, Core**		SAMPLE	CORE	CASING	DATE STARTED **9/9/03**
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **9/15/03**
GROUND WATER DEPTH **46.7'**	DIA.	"			DRILLER **M. Marshall**
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **M. Flusche**
DATE OF MEASUREMENT	FALL	**30"**			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION — KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6	1.33	2, 4, 6, 8			Brown; Clay and silt with some sand and gravel; Firm; Low plasticity; Dry. Some coarse gravel in bottom 2 inches of spoon.	60.1 / 7.0		Augering got difficult at 7' bgs.
8								
10	2	3, 4, 6, 5			Brown; Clay and silt with some sand and gravel; Firm; Medium plasticity; Almost moist.	55.1 / 12.0		Augering less difficult.
12								
14								
16	2	Weight, Weight, 3, 3			Brown; Clay and silt with sand and gravel. Firm; Medium plasticity; Moist.	51.6 / 15.5		
					Gray; Clay; Firm; Medium plasticity to plastic; Moist to wet.	50.1 / 17.0		
18								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-24B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
22	1.92	Weight 1 2 2			Gray; Clay; Firm; Medium plasticity; Wet to moist.	45.1 22.0		
24								
26	1.5	Weight 2 3 3			Gray; Clay; Firm; Medium plasticity; Wet.	40.1 27.0		
28								
30	1	1 6 5 6			Brown; Clay with sand and gravel, coarse gravel in bottom of spoon; Firm; Low plasticity; Wet.	35.1 32.0		
32								
34								
36		50/4 R			Brown; Clay with silt, sand, gravel and weathered rock. Firm; Low plasticity; Wet.	30.1 37.0		Refusal of spoon. Competent rock.
38								
40					Bluish gray; Siltstone; Slightly fractured and weathered; Fractures @ 40.8' bgs, 41.6' bgs, 42.4' bgs, 43.4' bgs, and 44.5' bgs.			100% Rec; 0.91 RQD
42								
44						22.1	45.0	
					Bluish gray; Siltstone; Moderately fractured and weathered; Fractures @	45.0		100% Rec; 0.85 RQD

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-24B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
48					45.6' bgs, 45.8' bgs, 46.3' bgs, 47' bgs, 47.5' bgs, 48.3' bgs, 48.7' bgs, and 49.4' bgs.	17.1		▼ 48.0
50					Bluish gray; Siltstone; Slightly fractured and weathered; Fractures @ 50.2' bgs, 52.7' bgs, 53.1' bgs, 53.9' bgs, and 54.5' bgs.	50.0 12.1		100% Rec; 0.95 RQD
52								
54								
56					Bluish gray; Siltstone; Slightly fractured and weathered; Fractures @ 55.75' bgs, 56.3' bgs, 56.6' bgs, and 58.1' bgs.	55.0 7.1		82% Rec; 0.80 RQD 60.0
58								
60						60.0		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-25B

PROJECT	RealCo MWN	LOCATION	Watervliet, NY			SHEET 1 OF 4
CLIENT						PROJECT No. 3938014
DRILLING CONTRACTOR	Parratt Wolfe					MEAS. PT. ELEV. 138.84
PURPOSE	Monitoring Well Installation					GROUND ELEV. 136.8
WELL MATERIAL	2" PVC					DATUM Site
DRILLING METHOD(S)	HSA, Air Rotary		SAMPLE	CORE	CASING	DATE STARTED 9/4/03
DRILL RIG TYPE	Drill Rig	TYPE				DATE FINISHED 9/8/03
GROUND WATER DEPTH	68.2'	DIA.	"			DRILLER M. Marshall
MEASURING POINT		WEIGHT	140 #			PIRNIE STAFF M. Flusche
DATE OF MEASUREMENT		FALL	30"			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6								
8								
10	1.17	1 2 8 9			Brown; Clay and silt; Firm; Low plasticity; Dry-slightly; Moist.	124.8 12.0		
12								
14								
16	1.92	4 3 4 4			Brown; Clay and silt; Firm; Medium plasticity; Moist.	119.8 17.0		
18								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-25B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 4
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
22	2	4 3 4 3			Brown; Clay and silt; Firm; Medium plasticity to plastic; Moist.	114.8 22.0		
24								
26	2	3 5 5 4			Brown; Clay and silt with some very thin (<0.5 mm) gray laminations; Firm; Medium plasticity; Moist.	109.8 27.0		
28								
30	2	4 4 5 8			Brown; Clay and silt; Firm; Medium plasticity to plastic; Moist.	105.8 31.0		
32					Brown; Clay and silt; Firm; Medium plasticity; Moist-wet.	104.8 32.0		
34								
36	1.75	12 30 50/0.4 R			Brown; Clay and silt; Firm; Low to medium plasticity; Dry. Sand, clay, and weathered rock. Weathered angular rock with some sand and clay.	101.3 35.5 100.8 36.0 99.8 37.0		
38								
40	1.5	50 42 35 20			Weathered angular rock; Competent rock in bottom inch.	94.8		
42					Competent rock; Bluish gray; Siltstone; Angular cuttings.	42.0		
44								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-25B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 4
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
48					As above.			
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								▼
70								
						71.5		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-25B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 4 OF 4
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
74					As above.			
							75.0	
76								
78								
80								
82								
84								
86								
88								
90								
92								
94								Water bearing fracture encountered @ 93' bgs.
96								
						39.3	97.5	
						97.5		

MALCOLM PIRNIE — TEST BORING LOG — BORING No. WW-26B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**		SHEET **1** OF **5**
CLIENT			PROJECT No. **3938014**
DRILLING CONTRACTOR	**Parratt Wolfe**		MEAS. PT. ELEV. **195.26**
PURPOSE	**Monitoring Well Installation**		GROUND ELEV. **193.4**
WELL MATERIAL	**2" PVC**		DATUM **Site**
DRILLING METHOD(S)	**HSA, Air Rotary**	SAMPLE / CORE / CASING	DATE STARTED **8/25/03**
DRILL RIG TYPE	**Drill Rig**	TYPE	DATE FINISHED **8/29/03**
GROUND WATER DEPTH	**44.5'**	DIA. **"**	DRILLER **L. Pech**
MEASURING POINT		WEIGHT **140 #**	PIRNIE STAFF **M. Flusche**
DATE OF MEASUREMENT		FALL **30"**	

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6								
8								
10	0.92	11 6 9 13			Mottled brown clay and silt; Firm; Low plasticity; Dry.	182.4 11.0		
12								
14	1.5	24 8 11 12			Brown; Clay and silt; Firm; Low plasticity; Dry.	177.4 16.0		
16								
18								
		23 8			Brown; Clay and silt; Firm; Medium plasticity; Dry.			

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-26B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 2 OF 5
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	1.5	8 10				172.4 21.0		Less silt than above
22								
24		6			Brown: Clay and silt; Soft; Medium plasticity; Moist.	168.4		
	2	6 6 7			Gray; Clay and silt; Soft; Medium plasticity; Moist.	25.0 167.4		
26						26.0		
28								
		1			Gray; Clay with some silt; Soft; Medium plasticity; Wet.			
30	1.92	2 2 2				162.4		
						31.0		
32		1			Gray; Clay with some silt; Soft; Medium plasticity; Wet.			
	1.67	1 1 1				159.4		
34						34.0		
36								
38								
		Weight			Gray; Clay with some silt; Soft; Medium plasticity; Wet.			
40	2	Weight Weight Weight				152.4		
						41.0		
42								Augers have a little resistance
44		20		△ △	Heavily weathered rock; Gray siltstone; Some angular, some rounded; Mostly dry; Slightly moist at bottom			▼
	1.33	46 38 50/0.4		△ △ △ △ △ △		147.4		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-26B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 5
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
						46.0		
48								
50								
52								Water first encountered in interface @ 52' bgs
						139.9		
54					Competent rock; Bluish gray; Siltstone; Angular cuttings.	53.5		
56								
58								
60								
62								
64								
66								
68								
70								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-26B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 4 OF 5
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. DEPTH	WELL Constr.	REMARKS
74						73.0		
76						77.0		
78								
80								
82								Water first encountered in bedrock at 82'
84								
86								
88								
90								
92								
94								
96								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-26B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 5 OF 5
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
100						93.4 / 100.0	100.0	

MALCOLM PIRNIE — TEST BORING LOG — BORING No. WW-27B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **3**
CLIENT					PROJECT No. **3938014**
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **161.72**
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **160.9**
WELL MATERIAL **2" PVC**					DATUM **Site**
DRILLING METHOD(S) **HSA, Air Rotary**		SAMPLE	CORE	CASING	DATE STARTED **8/20/03**
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **8/22/03**
GROUND WATER DEPTH **41.6'**	DIA.	"			DRILLER **L. Pech**
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **AB and MAF**
DATE OF MEASUREMENT	FALL	**30"**			

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4								
6								
8								
10	2	3 3 4 5			Brown; Clay and silt; soft; Medium plastic to plastic, Moist-wet.			
						148.9 12.0		
12								
14								
						145.7		
	1.5	10 48 50/0.3 R			Brown; Clay; Dry. Brown; Clay and angular weathered rock; Dry.	15.3 144.4 16.5		Split spoon refusal
16								
18								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-27B
PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**	SHEET **2** OF **3**
CLIENT		PROJECT No. **3938014**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
								Heavily weathered rock to 21.5' bgs
22						138.9 / 22.0		
					Competent rock			
24								
26					Bluish gray; Siltstone; Moderately weathered; Lots of partings and cracks; Fractures @ 27' bgs, 30' bgs, and 31' bgs.			90% Rec; 0.42 RQD
28								
30								
						129.4 / 31.5		
32					Bluish gray; Siltstone; Heavily weathered; Lots of cracks; Fractures @ 32.3' bgs, 33' bgs, 35' bgs, and 35.5' bgs.			100% Rec; 0.07 RQD
34								
36						124.4 / 36.5		
					Bluish gray; Siltstone; Slightly weathered; Few fractures, fractures @ 38.25' bgs, 39' bgs, and 40.5' bgs.			100% Rec; 0.78 RQD
38								
40								
						119.4 / 41.5		
42					Bluish gray; Siltstone; Moderately weathered; Fractures @ 42.3' bgs, 43' bgs, 43.5' bgs, 44.5' bgs, 45.5' bgs, and 46' bgs.			▼ 100% Rec; 0.45 RQD
44								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-27B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 3
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
						114.4		
					Bluish gray; Siltstone; Slightly weathered; Fractures @ 46.6' bgs, 47.4' bgs, 48.5' bgs, 49.6' bgs, and 51.4' bgs.	46.5		94% Rec; 0.80 RQD
48								
50							50.5	
						109.4		
					Bluish gray; Siltstone; Slightly weathered; Fractures @ 51.6' bgs, 53.5' bgs, 54.9' bgs, and 56' bgs.	51.5		100% Rec; 0.83 RQD
52							53.5	
54								
56						104.4		
					Bluish gray; Siltstone; Slightly weathered; Fractures @ 57.5' bgs, 58.6' bgs, and 60' bgs.	56.5		100% Rec; 0.70 RQD
58								
60						99.4		
					Bluish gray; Siltstone; Moderately weathered; Numerous fractures.	61.5		100% Rec; 0.30 RQD
62								
64								
66							66.0	
						94.4		
						66.5		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-28B

PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**				SHEET **1** OF **4**	
CLIENT					PROJECT No. **3938014**	
DRILLING CONTRACTOR **Parratt Wolfe**					MEAS. PT. ELEV. **150.86**	
PURPOSE **Monitoring Well Installation**					GROUND ELEV. **148.8**	
WELL MATERIAL **2" PVC**					DATUM **Site**	
DRILLING METHOD(S) **HSA, Air Hammer**		SAMPLE	CORE	CASING	DATE STARTED **8/19/03**	
DRILL RIG TYPE **Drill Rig**	TYPE				DATE FINISHED **9/3/03**	
GROUND WATER DEPTH **63.8'**	DIA.	"			DRILLER **L. Pech**	
MEASURING POINT	WEIGHT	**140 #**			PIRNIE STAFF **AB and MAF**	
DATE OF MEASUREMENT	FALL	**30"**				

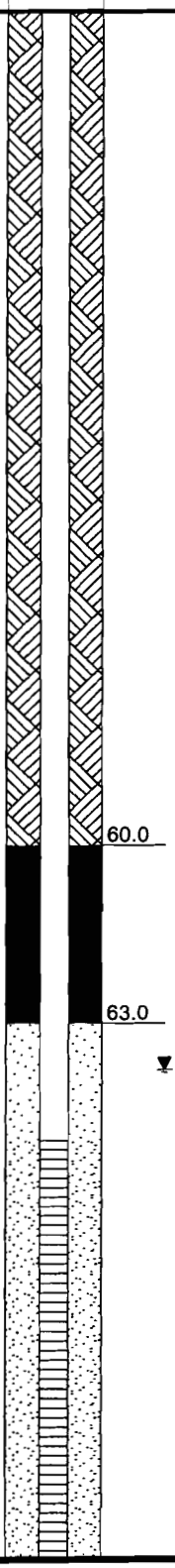
DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
2								
4	1.17	4 5 8 8			Brown; Mottled silt and clay; Occasional organic material and fine gravel; No-low plasticity; Dry-damp.	142.8 6.0		
6								
8								
10	2	7 8 9 11			Brown; Clay with some silt; Soft; Medium plasticity; Moist.	137.8 11.0		
12								
14	2	4 5 7 9			Brown; Clay with some silt; Soft; Medium plasticity; Moist.	133.8		
16					Brown; Clay and silt; Soft; Medium-low plasticity; Moist-wet.	15.0 132.8 16.0		
18								
		3 3			Brown; Clay and silt; Soft; Medium-low plasticity; Wet.	128.8		

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-28B
PROJECT **RealCo MWN**	LOCATION **Watervliet, NY**	SHEET **2** OF **4**
CLIENT		PROJECT No. **3938014**

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
	2	5 6			Blue/Gray; Clay layer; Soft; Medium plasticity to plastic; Wet.	20.0 128.3		
					Gray/Brown; Silt and clay with occasional silt lenses (2"); Soft; Low to medium plasticity; Wet.	20.5 127.8 21.0		
22								
24	2	3 3 3 3			Blue/Gray; Clay and silt; Soft; Medium to low plastic; Wet (not saturated).	122.8		
26						26.0		
28								
30	1.75	24 30 23 21			Blue/Gray; Clay and silt; Soft; Medium to low plastic; Wet (not saturated). Heavily weathered rock; Moist-Dry.	118.8 30.0 117.8		
32		75/0.2 R			No recovery. Competent rock; Bluish gray; Siltstone; Angular cuttings.	31.0		
34								
36								
38								
40								
42								
44								

MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-28B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 3 OF 4
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
48								
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								
70								



MALCOLM PIRNIE	TEST BORING LOG	BORING No. WW-28B
PROJECT RealCo MWN	LOCATION Watervliet, NY	SHEET 4 OF 4
CLIENT		PROJECT No. 3938014

DEPTH FT.	SAMPLE TYPE, RECOVERY, NUMBER	BLOWS ON SAMPLE SPOON PER 6"	PID	GRAPHIC LOG	GEOLOGIC DESCRIPTION KEY - Color, Major, Minor Moisture, Etc.	ELEV. / DEPTH	WELL Constr.	REMARKS
74						73.8 / 75.0	75.0	

ATTACHMENT C

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-1I DATE: 9/23/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 15.50

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 9.50

D: Volume of Water in Casing: 1.02

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 1.02 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date									
Time									
Gallons									
Well Volume									
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

9/23/03 1130: Initiate purge. Dry after <1 gallon.

1200: Purged dry 3 times. Purged about a gallon total.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-2B DATE: 9/17/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 57.30

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 45.40

D: Volume of Water in Casing: 2.02

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 2.02 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date									
Time	1510								
Gallons	1.5	3	4.5	6					
Well Volume									
Conductivity (mohm/cm)	1.29	1.28	1.29	1.23					
Dissolved Oxygen	15.78	15.54	15.4	15					
pH	7.4	7.45	7.41	7.33					
Temperature (°C)	16.4	165	17.8	17.5					
Turbidity	999	999	999	999					
Salinity	0.05	0.05	0.05	0.05					

Notes:

1500: Initiate well development.

1523: Dry. Not very clear.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-3B DATE: 9/17/03 and 9/24/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 62.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 36.00

D: Volume of Water in Casing: 4.42

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 4.42 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	9/17				9/24				
Time	1535	1545	1555						
Gallons	4.5	9	13.5		38.5				
Well Volume	1.02	2.04	3.05						
Conductivity (mohm/cm)	2.98	3.18	3.24						
Dissolved Oxygen	17.2	16.46	17.34						
pH	7.3	7.21	7.19						
Temperature (°C)	15.2	13.2	13.2						
Turbidity	616	338	100						
Salinity	0.13	0.15	0.16						

Notes:

9/17/03 1535: Initiate purge.

1550: Purged 13.5 gallons.

9/24/03 1100: Initiate purge.

1150: Purged 25 more gallons. Water is very clear.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-5 DATE: 9/18/03 and 9/23/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 47.75

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 20.95

D: Volume of Water in Casing: 4.56

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 4.56 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	9/18		9/23						
Time	825	945	1245	1345					
Gallons		40	50	57					
Well Volume	0.00	8.78	10.97	12.51					
Conductivity (mohm/cm)			3.52						
Dissolved Oxygen			11.6						
pH			7.1						
Temperature (°C)			13.5						
Turbidity			>999						
Salinity			0.17						
Depth to water		Dry		Dry					

Notes:

9/18/03 0825: Initiate development.

0945: Purged 40 gallons. Well went dry. Water is still cloudy

9/23/03 1220: Initiate purge.

1245: Purged 10 more gallons.

1345: Purged 7 more gallons. Still muddy.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-17 DATE: 9/18/03 and 9/23/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 16.50

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 6.50

D: Volume of Water in Casing: 1.70

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) = 1.70$ gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	9/18	9/23							
Time	1020	1415	1424	1431	1440	1449	1535	1545	1556
Gallons	20	30	40	50	60	70	80	90	100
Well Volume	11.76	17.65	23.53	29.41	35.29	41.18	47.06	52.94	58.82
Conductivity (mohm/cm)		3.2	3.13	3.13	3.1	3.09	3	3	2.96
Dissolved Oxygen		10.77	10.66	11.02	11.5	11.55	11.54	11.77	11.45
pH		6.51	6.56	6.56	6.54	6.53	6.57	6.58	6.55
Temperature (°C)		15.8	16.1	15.7	15.1	15	15.9	15.5	15.9
Turbidity		999	>999	>999	>999	>999	>999	>999	>999
Salinity		0.15	0.15	0.15	0.15	0.15	0.14	0.14	0.14

Notes:

9/18/03 1000: Initiate purge.

1020: Purged 20 gallons. Slightly cloudy.

9/23/03 1400: Initiate purge.

1500: Purged 75 gallons. Still cloudy.

Water efferveses and has slight odor.

1600: Purged 100 gallons. Only slightly cloudy.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-20B DATE: 9/17/03 and 9/23/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 32.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 18.20

D: Volume of Water in Casing: 2.35

$v = 0.0408 (B)^2 \times (A-C) = D$

v = 0.0408 ( )^2 x (-) = 2.35 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	9/17				9/23				
Time									
Gallons	4	8	14		21				
Well Volume	1.71	3.41	5.97		8.95				
Conductivity (mohm/cm)	0.94	0.981	0.961						
Dissolved Oxygen	13.38	15.08	16						
pH	7.39	7.26	7.26						
Temperature (°C)	14.2	14.3	14.3						
Turbidity	999	999	940						
Salinity	0.04	0.04	0.04						

Notes:

9/17/03 1315: Initiate purge.

1345: Purged 20 gallons. Water still cloudy.

9/23/03 Purged dry after 7 more gallons.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-23I DATE: 8/25/03 and 9/24/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 32.50

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 21.20

D: Volume of Water in Casing: 1.92

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) = 1.92$ gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	8/25		9/24						
Time									
Gallons	25		100						
Well Volume	13.01		52.06						
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

8/25/03 Purged 25 gallons.

9/24/03 0845: Initiate development.

Muddy if you surge but clearse up nicely (only slightly cloudy) if you stop surging.

0945: End development. 75 gallons purged today.

100 gallons purged total.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-23B DATE: 8/25/03 and 9/24/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 51.38

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 20.01

D: Volume of Water in Casing: 5.33

$v = 0.0408 (B)^2 \times (A-C) = D$

v = 0.0408 ( )^2 x (-) = 5.33 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	8/25		9/24						
Time									
Gallons	25		80						
Well Volume	4.69		15.00						
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

8/25/03 Purged 25

9/24/03 0700: Initiate development.

0810: End development. Purged 55 more gallons.

Slightly cloudy

80 gallons total purged.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-24I DATE: 9/17/03 and 9/22/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 35.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 11.00

D: Volume of Water in Casing: 4.08

$v = 0.0408 (B)^2 \times (A-C) = D$

v = 0.0408 ( )^2 x (-) = 4.08 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED											
Date	9/17									9/18	9/22	
Time	1042	1050	1100	1110	1120	1130	1140	1150	1200	1615	1035	1115
Gallons	8	12	16	20	25	29	32	36	40	95	115	140
Well Volume	1.96	2.94	3.92	4.90	6.13	7.11	7.84	8.82	9.80	23.28	28.19	34.31
Conductivity (mohm/cm)	1.12	1.1	1.12	1.11	1.15	1.12	1.15	1.14	1.14			
Dissolved Oxygen	13.17	12.41	12.85	13.03	13.17	13.53	13.21	13.54	13.32			
pH	7.34	7.34	7.31	7.33	7.32	7.3	7.28	7.3	7.3			
Temperature (°C)	13.3	13.7	13.2	13.7	13.9	13.7	13.7	13.2	13.1			
Turbidity	999	7	999	999	999	999	999	999	999			
Salinity	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05			

Notes:

9/17/2003: Initiate development. Purged 40 gallons.

9/18/03 1500: Initiate development. Purged 55 gallons. Still cloudy

9/22 1015: Initiate development. Purged 55 gallons.

140 gallons total purged.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-24B DATE: 9/17/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 60.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 46.70

D: Volume of Water in Casing: 2.26

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 2.26 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Time	1252								
Gallons	2								
Well Volume	0.88								
Conductivity (mohm/cm)	3.26								
Dissolved Oxygen	12.7								
pH	12.84								
Temperature (°C)	14.9								
Turbidity	5.67								
Salinity	0.18								

Notes:

1248: Initiate development.

1301: End well development. Well went dry.

Water very clear from start.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-25B DATE: 9/22/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 98.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 68.20

D: Volume of Water in Casing: 5.07

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 5.07 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Time	1320								
Gallons									
Well Volume									
Conductivity (mohm/cm)	1.76								
Dissolved Oxygen	9.79								
pH	8.76								
Temperature (°C)	22.4								
Turbidity	>999								
Salinity	0.09								

Notes:

1320: Initiate development. Water is cloudy.

1330: Well dry @ 5.5 gallons.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-26I DATE: 9/18/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 58.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 47.50

D: Volume of Water in Casing: 1.79

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 1.79 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Time	1100	1200	1430						
Gallons	0	35	55						
Well Volume									
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

1100: Initiate development.

1200: Purged 35 gallons.

1450: Purged 55 gallons. Still cloudy.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-26B DATE: 9/24/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 103.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 44.50

D: Volume of Water in Casing: 9.95

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 9.95 gal.

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETER	ACCUMULATED VOLUME PURGED								
Time									
Gallons									
Well Volume									
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

1230: Begin development with whale pump

1300: Five gallons purged. Drew water down to 61 feet below TOC. Switched to watara.

1400: Purged three gallons with watara

1420: Purged two more gallons after waiting 20 minutes. Five gallons left in tube.

15 gallons total purged.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-27B DATE: 9/17/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 70.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 41.58

D: Volume of Water in Casing: 4.83

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) \approx$ 4.83 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date									
Time									
Gallons									
Well Volume									
Conductivity (mohm/cm)									
Dissolved Oxygen									
pH									
Temperature (°C)									
Turbidity									
Salinity									

Notes:

1620: Initiate development.

1640: Dry. Pretty clear.

MALCOLM PIRNIE

WELL DEVELOPMENT/ PURGING LOG

WELL NUMBER: WW-28B DATE: 9/22/2003 and 9/23/03

PROJECT NAME: RealCo Monitoring Well Network Completion

PROJECT NUMBER: 3938014

A: Total Casing and Screen Length: 75.00

B: Casing Internal Diameter: 2.00

C: Water Level Below Top of Casing: 63.80

D: Volume of Water in Casing: 1.90

Well I.D.	Vol. Gal./ft.
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

$v = 0.0408 (B)^2 \times (A-C) = D$

$v = 0.0408 (\quad)^2 \times (\quad - \quad) =$ 1.90 gal.

PARAMETER	ACCUMULATED VOLUME PURGED								
Date	9/22						9/23		
Time	1500	1531	1540	1605	1635				
Gallons	2	4.5	6	6.5	7.2		12.2		
Well Volume	1.05	2.36	3.15	3.41	3.78				
Conductivity (mohm/cm)	4.56	4.71	4.73	4.82	4.83				
Dissolved Oxygen	14.5	13.61	13.42	12.93	12.74				
pH	7.11	6.98	6.96	7.23	6.94				
Temperature (°C)	14.5	14.2	13.9	13.9	13.3				
Turbidity	>999	>999	540	>999	>999				
Salinity	0.23	0.24	0.24	0.24	0.24				

Notes:

9/22/03 1410: Initiate development.

1415 Well dry @ 2.3 gallons.

1510: Well dry @ 2.1 gallons. Water has gray color.

1545: Well dry @ 2 gallons.

1610: Well dry @ 1 gallon.

1640: Well dry @ 0.75 gallons

9/23/03 Dry @ 5 gallons. Still cloudy

12.2 gallons total purged.