APPENDIX D – WELL CONSTRUCTION LOGS
### WATERLOO INSTALLATION LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Depth to Bottom**  
J.U. to top of casing

**Depth to Water**  
J.U to top of casing

**Ground Elevation**  
77.5 NGVD 29

**Date Start/End**  
8/3/2006, 2/22/07, 3/16/07

**Casing Elevation**  
75.6 NGVD 29

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### Transducers

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Depth (ft below casing)</th>
<th>Elevation (m.s.l.)</th>
<th>Pressure Range (psi)</th>
<th>Linear Gage Factor (G)</th>
<th>Thermal Factor (K)</th>
<th>Accuracy (+/- ft H2O)</th>
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<tbody>
<tr>
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### Factory Zero Transducer Readings

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<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Frequency Reading</th>
<th>Temp (°C)</th>
<th>Barometric Pressure (ft H2O)</th>
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### Wellhead Zero Readings

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<thead>
<tr>
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<th>Time of Reading</th>
<th>Frequency Reading</th>
<th>Temp (°C)</th>
<th>Barometric Pressure (ft H2O)</th>
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### Post-Installation (Pre-Inflation) Transducer Readings

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<th>Barometric Pressure (ft H2O)</th>
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### Notes

1. All depths and measurements referenced to the final top of well casing.
2. This log depicts adjustments made to original waterloo system installed on 8/3/06.
3. Adjustments are listed below:
4. Manifold installed and an additional 2 foot section of PVC removed on 3/16/07.
5. On 3/7/07 Distance to Waterline was 1.1 feet from top of steel casing.
6. On 3/7/07 Distance between steel casing and PVC riser was 30.76 feet from top of steel casing.
7. 2-foot by 2-foot well vault installed within concrete, flush with ground surface.

---

**Transducers**

### Factory Zero Transducer Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Frequency Reading</th>
<th>Temp (°C)</th>
<th>Barometric Pressure (ft H2O)</th>
<th>Time of Baro Reading</th>
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<th>Zone</th>
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### Wellhead Zero Readings

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<th>Frequency Reading</th>
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### Post-Installation (Pre-Inflation) Transducer Readings

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</table>

### Notes
1. All depths and measurements referenced to the final top of well casing.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
### WATERLOO INSTALLATION LOGS

**GZA GEC ENVIRONMENTAL OF NEW YORK**

**NEW YORK, NEW YORK 10001**

**440 NINTH AVENUE, 18th FLOOR**

**SCIENTISTS AND ENGINEERS**

Indian Point Energy Center

Buchanan, NY

**NEW YORK, NEW YORK 10001**

**2.2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.**

**Depth to Bottom:** 193.92 ft below top of casing

**Zone**

| Serial # | Date       | Time of Reading | Pressure | Linear Gain Factor | Thermal Factor | Accuracy
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</table>

**NOTES**

1. All depths and measurements referenced to the top of well casing.

2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
### Post-Installation (Pre-Inflation) Transducer Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Frequency</th>
<th>Time of Reading</th>
<th>Depth (ft below casing)</th>
<th>Diaphragm Elevation (m.s.l.)</th>
<th>Pressure Range (psi)</th>
<th>Linear Gage Factor (G)</th>
<th>Thermal Factor (K)</th>
<th>Accuracy (°C/ft H20)</th>
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### Factory Zero Transducer Readings

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<tr>
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### Wellhead Zero Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Frequency</th>
<th>Time of Reading</th>
<th>Depth (ft below casing)</th>
<th>Diaphragm Elevation (m.s.l.)</th>
<th>Pressure Range (psi)</th>
<th>Linear Gage Factor (G)</th>
<th>Thermal Factor (K)</th>
<th>Accuracy (°C/ft H20)</th>
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<tbody>
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### Notes

1. All depths and measurements referenced to the top of well casing.
2. Wellhead zero times are approximate within 15 minutes of actual readings.
3. 2-foot by 2-foot by 2-foot vault installed within concrete, flush with ground surface.
### WATERLOO INSTALLATION LOG

#### Zone Transducers

<table>
<thead>
<tr>
<th>Zone</th>
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<th>Frequency</th>
<th>Temperature (°C)</th>
<th>Barometric Pressure (H20)</th>
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<td>12.1</td>
<td>11:45</td>
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</table>

#### Factory Zero Transducer Readings

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<tr>
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<th>Frequency Reading</th>
<th>Temperature Reading</th>
<th>Barometric Pressure (H20)</th>
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#### Wellhead Zero Transducers

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<tr>
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<th>Temperature Reading</th>
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#### Post-Installation (Pre-Inflation) Transducer Readings

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<th>Frequency Reading</th>
<th>Temperature Reading</th>
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<th>Time of Baro Reading</th>
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### Notes
1. All depths and measurements referenced to the final top of well casing.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
### Transducers

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<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Depth (ft below casing)</th>
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<th>Linear Gage Factor (SG)</th>
<th>Thermal Factor (K)</th>
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### Factory Zero Transducer Readings

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<th>Frequency Reading</th>
<th>Barometric Pressure (H2O)</th>
<th>Time of Baro. Comp.</th>
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### Wellhead Zero Readings

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<thead>
<tr>
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<th>Date</th>
<th>Frequency Reading</th>
<th>Barometric Pressure (H2O)</th>
<th>Time of Baro. Comp.</th>
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### Post-Installation (Pre-Filling) Transducer Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Frequency Reading</th>
<th>Barometric Pressure (H2O)</th>
<th>Time of Baro. Comp.</th>
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<tbody>
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### Notes

1. All depths and measurements referenced to the final top of well casing.
2. Wellhead zero times are within 15 minutes of actual readings.
3. 2-foot by 2-foot by 2-foot wall vault installed within concrete, flush with ground surface.
## Wellhead Zero Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Time of Reading</th>
<th>Frequency Reading</th>
<th>Temperature (°C)</th>
<th>Barometric Pressure (ft H20)</th>
<th>Time of Bare</th>
<th>Baro. Pressure (ft H20)</th>
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</table>

## NOTES

1. All depths and measurements referenced to top of well casing.
2. Wellhead zero times and Post-Installation reading times are approximate within 15 minutes of actual readings.
3. 2-foot by 2-foot wall vault installed within concrete, flush with ground surface.
**Table: Post-Installation (Pre-Inflation) Transducer Readings**

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Time of Reading</th>
<th>Depth (ft)</th>
<th>Temperature (ºC)</th>
<th>Barometric Pressure (in H2O)</th>
<th>Time of Baro Reading</th>
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**Notes:**
1. All depths and measurements referenced to the final top of well casing.
2. 2-foot by 2-foot well vault installed within concrete, flush with ground surface.

---

**Table: Factory Zero Transducer Readings**

<table>
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<tr>
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<th>Serial #</th>
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<th>Frequency</th>
<th>Temperature (ºC)</th>
<th>Barometric Pressure (in H2O)</th>
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<tr>
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<th>Serial #</th>
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<th>Barometric Pressure (in H2O)</th>
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**Table: Transducers**

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<th>Frequency</th>
<th>Pressure Reading</th>
<th>Temperature (ºC)</th>
<th>Barometric Pressure (in H2O)</th>
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<tr>
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<th>Frequency</th>
<th>Temperature (ºC)</th>
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**GZA GEOENVIRONMENTAL OF NEW YORK**

**WATERLOO INSTALLATION LOG**

**Client:** Entergy

**Project Location:** Indian Point Energy Center

**WELL ID:** MW-60

**DATE START END:** CASING ELEVATION 12.48 NGVD 29

**CONTRACTOR REP:** Bruce Blackburn

**GROUND ELEVATION** 14.31 NGVD 29

**CONTRACTOR:** Solinst

**DEPTH TO WATER:** Refer to Table 6.1 ft below top of casing

**GZA ENGINEER:** Steve Kline

**DEPTH TO BOTTOM:** 200.5 ft below top of casing

**SCIENTISTS AND ENGINEERS:** Buchanan, NY

---

### Post-Installation (Pre-Inflation) Transducer Readings

<table>
<thead>
<tr>
<th>Zone</th>
<th>Serial #</th>
<th>Date</th>
<th>Time of Reading</th>
<th>Frequency Reading</th>
<th>Temp (°C)</th>
<th>Barometric Pressure (H2O)</th>
<th>Title of Baro Reading</th>
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### Notes

1. All depths and measurements referenced to the final top of well casing.
2. Splice in port 55 transducer cable at elevation 26 ft msl.
3. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.

---

### Wellhead Zero Readings

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<tr>
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<th>Serial #</th>
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### Factory Zero Transducer Readings

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**PROJECT LOCATION:** Waterloo

**ZONE BOUNDARIES:** EXISTING BOUNDARIES

**DEVELOPMENT:** Exposed Groundwater Conditions

**DEEP SOIL DATA:**

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**POST-INSTALLATION TEST**

---

**GZA**

**WELL No.** 04-001

---

**TABLE 6.1**

---

**GZA**

**WELL No.** 04-001
## WATERLOO INSTALLATION LOG

### Factory Zero Transducer Readings

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<tr>
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<th>Serial #</th>
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<th>Frequency Reading</th>
<th>Temp (ºC)</th>
<th>Barometric Pressure (H Hg)</th>
<th>Accuracy (ºF/ft H20)</th>
<th>Time of Arrival</th>
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### Post-Installation (Pre-Inflation) Transducer Readings

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<th>Barometric Pressure (H Hg)</th>
<th>Accuracy (ºF/ft H20)</th>
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<td>0.015</td>
<td>10/29/07</td>
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### Notes

1. All depths and measurements referenced to the top of well casing.
2. Wellhead zero times are approximate within 15 minutes of actual readings.
3. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
4. Monitoring wells installed in the overburden soils adjacent to the 201-foot boring.
TRANSDUCERS

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<th>Pressure Range (psig)</th>
<th>Linear Gage Factor (G)</th>
<th>Thermal Factor (K)</th>
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WATERLOO INSTALLATION LOG

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<th>Diaphragm Elevation (m.s.l.)</th>
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<th>Linear Gage Factor (G)</th>
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FACTORY ZERO TRANSDUCER READINGS

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WELLHEAD ZERO READINGS

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POST-INSTALLATION (PRE-INFLATION) TRANSDUCER READINGS

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NOTES

1. All depths and measurements referenced to the final top of well casing.
2. Wellhead zero times are approximate within 15 minutes of actual readings.
3. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
4. Monitoring wells installed in the overburden soils adjacent to the 201-foot boring.
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<td>24.6</td>
<td>33.1</td>
<td>48.8</td>
<td>PACKER</td>
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</table>

Notes:
- All readings were taken using transducer in top of 0.5 ft casing at start of evaluation.
- Cable of transducer at port 276 was spliced approximately 134' below top of casing.
- Depth to bottom measurement prior to installation was 347.9. After installation completion, an approximate 0.3 ft of depth had been lost.
- Elevations and depths to top of Waterloo components indicate measurements at the joint of the component.
**Notes:**

1. No equipment installed. Boring left as an open borehole monitoring point.
2. Borehole above 13 feet is 4.5 inches in diameter.
**Notes:**

1. No equipment installed. Boring left as an open borehole monitoring point.
2. Borehole above 7 feet is 4.5 inches in diameter.
## OPEN ROCK WELL INSTALLATION LOG

**REPORT OF BORING NO.** MW-35  
**BORING LOCATION** See Exploration Location Plan  
**DATE START** 12/5/06  
**DATE END** 12/6/06

### AS-BUILT

- **Depth**
- **Ground Surface Elevation** 18.6'
- **Bedrock 8'**
- **10.6'**
- **3.7/8-inch diameter borehole**
- **30'**
- **-11.4'**

**Notes:**
1. No equipment installed. Boring left as an open borehole monitoring point.  
2. Borehole above 8 feet is 4.5 inches in diameter.
Notes:
1. Borehole above 24 feet is 6.5 inches in diameter.
Notes:
1. Borehole above 25 feet is 6.5 inches in diameter.
Notes:
1. Bedrock not encountered.
Elevation 54.87'

Bedrock 13'

2-inch diameter PVC
5'

15'
15.5'

22'

3 7/8-inch diameter borehole

AS-BUILT

Notes:
1. Borehole above 15.5 feet is 4.5 inches in diameter.
Notes:
1. Borehole above 26 feet is 4.5 inches in diameter.
Notes:
1. Borehole above 37.5 feet is 4.5 inches in diameter.
1. Borehole above 34 feet is 4.5 inches in diameter.
1. Borehole above 16.5 feet is 4.5 inches in diameter.
Notes:
1. No equipment installed. Boring left as an open borehole monitoring point.
2. Borehole above 6.5 feet is 4.5 inches in diameter.
Notes:
1. Borehole above 14 feet is 6.5 inches in diameter.
### Groundwater Observation Well Installation Log

**AS-BUILT**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Elevation</th>
<th>Installed Material</th>
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</thead>
<tbody>
<tr>
<td>6'</td>
<td>15.39'</td>
<td>2-inch diameter PVC</td>
</tr>
<tr>
<td>8'</td>
<td>9.4'</td>
<td>Sand</td>
</tr>
<tr>
<td>23'</td>
<td>-7.6'</td>
<td>Bentonite</td>
</tr>
<tr>
<td>25'</td>
<td>-9.6'</td>
<td>PVC Casing</td>
</tr>
<tr>
<td>32'</td>
<td>-16.6'</td>
<td>PVC Screen</td>
</tr>
<tr>
<td>33'</td>
<td>-17.6'</td>
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</tr>
<tr>
<td>33'</td>
<td>-17.6'</td>
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</table>

**Bedrock 25'**

**Notes:**

1. Borehole above 25 feet is 4.5 inches in diameter.
Notes:
1. Boreholes above 30 feet are 4.5 inches in diameter.
2. The 25-foot-deep well was installed adjacent to the nested wells.
**Depth** | **Elevation**
---|---
12' | 14.92'
2' | 12.9'

**Installed Material**
- Sand
- Bentonite
- PVC Casing
- PVC Screen
- Concrete

**Notes:**
1. Borehole above 6 feet is 4.5 inches in diameter.
## GROUNDWATER OBSERVATION WELL INSTALLATION LOG

**Boring No.:** MW-52  
**Report of Boring No.:** MW-52  
**File No.:** 41.0017869.1C  
**Boring Location:** See Exploration Location Plan  
**Ground Surface Elev.:** 16.77' NGVD 29  
**Date Start:** 3/21/06  
**Date End:** 3/21/06  

### AS-BUILT

<table>
<thead>
<tr>
<th>Depth</th>
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</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>1.3'</td>
<td>16.77'</td>
<td>Sand</td>
</tr>
<tr>
<td>2'</td>
<td>15.47'</td>
<td>Bentonite</td>
</tr>
<tr>
<td>12'</td>
<td>14.77'</td>
<td>PVC Casing</td>
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<tr>
<td></td>
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<td>PVC Screen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.77'</td>
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### Notes:
1. Monitoring well is installed within the backfill of the trench excavated into rock for storm drain, fire and service water pipes.
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

REPORT OF BORING NO. T1-U1-1
FILE NO. 41.0017869.10

ENTERGY
Indian Point Energy Center
Buchanan, New York

ENGINEERS AND SCIENTISTS
CHECKED BY DW

BORING CO. Aquifer Drilling & Testing
FOREMAN Ed Borner
GZA ENG. Anton Gallas

GROUND LOCATION See Exploration Location Plan
GROUND SURFACE ELEV. 69.67' DATUM NGVD 29

DATE START 6/16/06 DATE END 6/16/06

Notes:

AS-BUILT

2-inch diam PVC pipe

Depth

Elevation 69.67'

1' 68.7' 66.7'

2' 66.7'

18' 51.7'

23' 46.7'

25' 44.7'

30' 39.7'

Installed Material

Sand
Bentonite
PVC Casing
PVC Screen
Concrete Mix
Grout Mix
AS-BUILT

Notes:
1. Borehole above 37.5 feet is 5 1/2 inches in diameter
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001
ENGINEERS AND SCIENTISTS

REPORT OF BORING NO. MW-55
BORING LOCATION
See Exploration Location Plan
FINGER PRINT

FOREMAN
Ed Borner
GROUND SURFACE ELEV. 18.25'
FOREMAN
Anton Gallias
DATE START 9/22/06
DATE END 9/22/06

GZA ENG. Anton Gallias
DATE CHK'D BY DW

AS-BUILT

Notes:
1. Borehole above 11.5 feet is 4 1/2 inches in diameter.
Notes:
1. Borehole above 31 feet is 4 1/2 inches in diameter.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
1. Borehole above 7 feet is 4 1/2 inches in diameter.
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001
ENGINEERS AND SCIENTISTS

GROUNDWATER OBSERVATION WELL INSTALLATION LOG

REPORT OF BORING NO. MW-58
Sheets 1 of 1
FILE NO. 41.0017869.10
CHKD BY DW

BORING CO. Aquifer Drilling & Testing
FOREMAN Ed Borner
GZA ENG. Anton Gallas

GROUND SURFACE ELEV. 14.57’ DATUM NGVD 29
DATE START 9/25/06 DATE END 9/25/06

AS-BUILT

Notes:
1. Borehole above 16.5 feet is 4 1/2 inches in diameter.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
GROUNDWATER OBSERVATION WELL INSTALLATION LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

ENTERGY
Indian Point Energy Center
Buchanan, New York

FILE NO. 41.0017869.10

GZA ENG. Anton Gallas
DATE START 10/4/07
DATE END 10/4/07

AS-BUILT

Notes:
1. Borehole above 18 feet is 4 1/2 inches in diameter.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
Notes:
1. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
2. Monitoring wells installed in the overburden soils adjacent to the 201-foot boring.
Notes:
1. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
2. Monitoring wells installed in the overburden soils adjacent to the 193-foot boring.
1. Borehole above 38 feet is 4 1/2-inches in diameter.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
1. Top of bedrock is at 37 feet.
2. 2-foot by 2-foot by 2-foot well vault installed within concrete, flush with ground surface.
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THE FOLLOWING IS PROVIDED WITH THE CAVEAT THAT THE PRECISION INDICATED IS GREATER THAN THE ACTUAL PRECISION OF THE SURVEY DATA.

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### SEPTEMBER 2007

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NS - Not Surveyed
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NOTE:
- NS - Not Surveyed
- pvc coupling attached for pneumatic installation
- casing cut for well vault installation
- elevation for 4" well casing prior to MW-56-53
- elevation for 4" well casing prior to MW-56-83

NS - Not Surveyed
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**NOTE**

NS - Not Surveyed
41.0017869.10

NS - Not Surveyed

18.496

Mar 2006
Mar 2006
Nov 2006
Apr 2006
May 16 2007

U3-T1

U3-T2

I-2

HR-1

36.000
17.020

Mar 2006
Mar 2006
Nov 2006
NA

MH-4

MH-4A

MH-5

N Curtain Drain

Sphere Found. Sump NA

18.540

12.707

16.949

14.847

Mar 2006

MH-3

20.073

75.822

(Feb 15 2007*) Mar 2007
May 16 2007

81.280
76.518

(Jan 31 2007*) Feb 2007

15.054

May 16 2007
Nov 2006

15.054

18.060

Apr 2006

18.069

11.891

May 17 2007
May 17 2007

11.901

Jan 2007
Jan 2007

11.910

Apr 2006

82.230

8.512

8.518

13.943

U1CSS

RW-1

U2-C1

U3-C1

OUT-1

18.517

Dec 2005

U3-4S

14.599
14.519

Dec 2005
Dec 2005

14.114

U3-4D

Dec 2005

U3-2

13.495

36.773

18.380

19.385

Top of Casing
Elevation

U3-3

Dec 2005
Dec 2005

U3-1

Nov 2006

Mar 20 2006

Dec 2005

Date of Survey (*date of
alteration)

MW-112

MW-111

WELL ID

PAGE 5 OF 5

14.000

33.000

NA

NA

NA

NA

15.088

77.5 (NS)

NS

72.690

12.031

12.054

15.003

14.981

8.204

8.188

NS

14.994

NS

80.920

3.259

3.267

14.653

14.819

14.849

14.164

NA

NS

18.930

NS

Ground Surface
Elevation

NA

NA

NA

NA

4.985

8.590

3.023

3.000

3.057

3.088

3.687

3.713

3.502

1.310

5.253

5.251

-0.550

Distance from
Ground Surface to
Top of Casing (as
surveyed)

INDIAN POINT ENERGY CENTER
MASTER ELEVATION LIST

casing cut approx 1 ft

NOTES

3.020

3.000

NA

NA

NA

NA

5

casing cut 0.69'

3.78 casing cut 4.3'

3

3.65

5.15

5.15

-0.71

-0.3

-0.25

-0.05

NA road box in sinkhole/ ground surfac

-0.59 casing cut and new manhole install

Measured Distance
from Ground
Surface to Top of
Casing

9.13.07


### Column of Water in Well:

- Depth to Bottom (ft) - Static Water Level (ft): **39.02 - 10.67**
- Water Column (T): **28.35 (ft)**
- Well Diameter: **4 (inches)**
- Well Volume: **18.5 (gal)**

### Pump Depth (ft):
- **38**

### Static Water Level (ft):
- **10.67**

### Engineer:
- A. Hough

### Weather:
- Sunny, 80's F

### Test Date:
- 5/24/2007

### Specific Capacity Test

<table>
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<th>Elapsed Time (min)</th>
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<th>Transducer Reading (ft)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
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### Notes and Observations:

Pumping rate could not be increased above 2.5 gpm due to limited power supply.
**COLUMN OF WATER IN WELL:**

- Depth to Bottom (ft) - Static Water Level (ft): $49.18 - 34.81$
- Water Column (T): $14.37$ (ft)
- Well Diameter: $2$ (inches)
- Well Volume: $2.3$ (gal)

**PUMP DEPTH (ft):** $48$

**STATIC WATER LEVEL (ft):** $34.81$

**ENGINEER:** A. Gallas

**WEATHER:** Sunny Mid 80's

**TEST DATE:** 5/30/2006

### Specific Capacity Test

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### Rising Head Test

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<th>Drawdown (ft)</th>
<th>Pumping Rate (gpm)</th>
<th>Specific Capacity (gpm/ft)</th>
<th>Specific Capacity (Q/s)</th>
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**NOTES AND OBSERVATIONS:**

- Pressure transducer was referenced to elevation 34.34’ msl.
- At 8:45, water flow ceased.
- At 8:47, pump was turned off to allow recovery. Water levels were recorded as a rising head test.
COLUMN OF WATER IN WELL:
Depth to Bottom (ft) - Static Water Level (ft)
= 61.92 - 15.52
Water Column (T): 46.4 (ft)
Well Diameter: 2 (inches)
Well Volume: 7.6 (gal)

PUMP DEPTH (ft): 55'
STATIC WATER LEVEL (ft): 15.52
ENGINEER: A. Gallas
WEATHER: Sunny
TEST DATE: 5/22/2006

Specific Capacity Test

<table>
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<tr>
<th>Time</th>
<th>Elapsed Time</th>
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<th>Drawdown (ft)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
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Rising Head Test

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<th>Drawdown (ft)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
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NOTES AND OBSERVATIONS:
Transducer depth approximately 50 feet below ground surface.
Top of casing elevation: 47.821 ft
Sustained yield test started at 11:50.
At 12:42, pumping rate was increased in order to lower water level for rising head test.
## COLUMN OF WATER IN WELL:

Depth to Bottom (ft) - Static Water Level (ft)

\[
\text{PUMP DEPTH (ft):} = 67.41 - 58.41 = 9.01 \\
\text{STATIC WATER LEVEL (ft):} = 58.41
\]

Water Column (T): 9.0 (ft)
Well Diameter: 2 (inches)
Well Volume: 1.5 (gal)

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time</th>
<th>Depth to Water (ft)</th>
<th>GW Elevation (ft msl)</th>
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## NOTES AND OBSERVATIONS:

1. Water flow ceased.
2. Pumping resumed.
3. Pumping resumed. Rate increased to 1.2 gpm to draw down water level for rising head test.
5. At 10:08, depth to water in MW 44-104 was 68.4'.
## COLUMN OF WATER IN WELL:

Depth to Bottom (ft) - Static Water Level (ft) = 43.6 - 23.76 = 20.84 (ft)

Water Column (T): 19.84 (ft)

Well Diameter: 2 (inches)

Well Volume: 3.2 (gal)

### PUMP DEPTH (ft):

42

### STATIC WATER LEVEL (ft):

23.76

### ENGINEER:

A. Gallas/ D. Bastos

### WEATHER:

Sunny

### TEST DATE:

5/24/2006

## Specific Capacity Test

<table>
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<th>Transducer Reading (ft)</th>
<th>Drawdown (ft)</th>
<th>Pumping Rate (gpm)</th>
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### NOTES AND OBSERVATIONS:

- Indian Point Energy Center, Buchanan, NY
- Specific Capacity Test
- Depth to Bottom (ft) - Static Water Level (ft) = 43.6 - 23.76 = 20.84 (ft)
- Water Column (T): 19.84 (ft)
- Well Diameter: 2 (inches)
- Well Volume: 3.2 (gal)
- Pump Depth (ft): 42
- Static Water Level (ft): 23.76
- Engineer: A. Gallas/ D. Bastos
- Weather: Sunny
- Test Date: 5/24/2006
- Notes: 117.2 Hz
### COLUMN OF WATER IN WELL:

- **Depth to Bottom (ft) - Static Water Level (ft):**
  - \[ = 43.6 - 23.76 = 19.84 \text{ (ft)} \]
- **Water Column (T):** 19.84 (ft)
- **Well Diameter:** 2 (inches)
- **Well Volume:** 3.2 (gal)
- **Pump Depth (ft):** 42
- **Static Water Level (ft):** 23.76
- **Engineer:** A. Gallas/ D. Bastos
- **Weather:** Sunny
- **Test Date:** 5/24/2006

### Specific Capacity Test

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### Notes and Observations:

1. Increased pumping rate to draw down water level for rising head test.
2. Pump OFF to allow for recovery.
### Specific Capacity Test

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### NOTES AND OBSERVATIONS:

Pumping rate could not be increased above 2.25 gpm due to limited power supply.
## COLUMN OF WATER IN WELL:

- Depth to Bottom (ft) - Static Water Level (ft) = 66.75 - 11.42
- Water Column (T): 55.33 (ft)
- Well Diameter: 1 (inches)
- Well Volume: 2.2 (gal)

## PUMP DEPTH (ft): 25

- STATIC WATER LEVEL (ft): 11.42
- ENGINEER: T. Bohlen
- WEATHER: sunny, low 30s
- TEST DATE: 3/17/2006

### Specific Capacity Test

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### NOTES AND OBSERVATIONS:

Purge water appears clear.
COLUMN OF WATER IN WELL:

Depth to Bottom (ft) - Static Water Level (ft)

\[ \text{STATIC WATER LEVEL (ft): } 27.6 \]

Water Column (T): 168.3 (ft)
Well Diameter: 4 (inches)
Well Volume: 109.9 (gal)

WEATHER:


Specific Capacity Test

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NOTES AND OBSERVATIONS:
COLUMN OF WATER IN WELL:
Depth to Bottom (ft) - Static Water Level (ft)
= 200 - 10.6
Water Column (T): 189.4 (ft)
Well Diameter: 4 (inches)
Well Volume: 123.7 (gal)

PUMP DEPTH (ft): ~30'
STATIC WATER LEVEL (ft): 10.6
ENGINEER: D. Kirkiland
WEATHER: Sunny 50's
TEST DATE: 3/28/2006

Specific Capacity Test

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NOTES AND OBSERVATIONS:
**COLUMN OF WATER IN WELL:**

Depth to Bottom (ft) - Static Water Level (ft) = 80 - 60.90

| Water Column (T): | 19.1 (ft) |
| Well Diameter:    | 2 (inches) |
| Well Volume:      | 3.1 (gal) |

| PUMP DEPTH (ft):     | 78 |
| STATIC WATER LEVEL (ft): | 60.90 |

| ENGINEER: | A. Hough |
| WEATHER:  | sun, 40's F |

**TEST DATE:** 12/19/2006

**Specific Capacity Test**

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time</th>
<th>Depth to Water (ft)</th>
<th>Drawdown (ft) (s)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
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**NOTES AND OBSERVATIONS:**
**Column of Water in Well:**

Depth to Bottom (ft) - Static Water Level (ft)

\[
\begin{array}{c}
\text{Depth to Bottom (ft)} - \text{Static Water Level (ft)} \\
25 - 14.90 \\
\end{array}
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<td>Well Volume:</td>
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**Pump Depth (ft):**

**Static Water Level (ft):**

\[
\begin{array}{c}
\text{Static Water Level (ft):} \\
14.90 \\
\end{array}
\]

**Engineer:**

A. Hough

**Weather:**

Sun, 40's F

**Test Date:**

12/19/2006

### Specific Capacity Test

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<th>Time</th>
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<th>Drawdown (ft)</th>
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### Notes and Observations:

- Depth to Bottom (ft) - Static Water Level (ft)
- Water Column (T): 10.10 (ft)
- Well Diameter: 2 (inches)
- Well Volume: 2.7 (gal)
- Pump Depth (ft): 23
- Static Water Level (ft): 14.90
- Engineer: A. Hough
- Weather: Sun, 40's F
- Test Date: 12/19/2006
**COLUMN OF WATER IN WELL:**

- Depth to Bottom (ft) - Static Water Level (ft): \( \frac{48 - 38.11}{9.89} \) ft
- PUMP DEPTH (ft): 46 ft
- STATIC WATER LEVEL (ft): 38.11 ft
- ENGINEER: A. Hough
- WEATHER: cloudy, 40's F
- TEST DATE: 12/18/2006

**Specific Capacity Test**

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<tr>
<th>Time</th>
<th>Elapsed Time</th>
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<th>Pumping Rate (gpm) (Q)</th>
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**NOTES AND OBSERVATIONS:**
### Specific Capacity Test

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<th>Time</th>
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### NOTES AND OBSERVATIONS:

Water was pumped using Grundfos ReadiFlo II submersible pump with maximum pumping capability of approximately 5.5 gpm. No more than 0.44’ drawdown could be achieved.

Water is cloudy and grayish brown throughout test.

Drawdown depicted may actually be normal response to tidal influence.
COLUMN OF WATER IN WELL:
Depth to Bottom (ft) - Static Water Level (ft)
= 15 - 8.55
Water Column (T): 6.45 (ft)
Well Diameter: 6 (inches)
Well Volume: 9.5 (gal)

ENGINEERS AND SCIENTISTS
ENGINEER:
TEST DATE:
WEATHER:
Specific Capacity Test

<table>
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<th>Time</th>
<th>Elapsed Time (min)</th>
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<td>0.2</td>
<td></td>
</tr>
<tr>
<td>15:59</td>
<td>121</td>
<td>11.93</td>
<td>3.38</td>
<td>0.60</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>16:03</td>
<td>125</td>
<td>11.96</td>
<td>3.41</td>
<td>0.60</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>16:04</td>
<td>126</td>
<td>--</td>
<td>--</td>
<td>0.00</td>
<td>--</td>
<td>pump off</td>
</tr>
</tbody>
</table>

NOTES AND OBSERVATIONS:

**COLUMN OF WATER IN WELL:**

<table>
<thead>
<tr>
<th>Depth to Bottom (ft) - Static Water Level (ft)</th>
<th>PUMP DEPTH (ft):</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 - 9.38</td>
<td>13</td>
</tr>
</tbody>
</table>

**Water Column (T):** 4.62 (ft)

**Well Diameter:** 4 (inches)

**Well Volume:** 3.0 (gal)

**ENGINEER:** S. Covelli

**WEATHER:** low 70's

**TEST DATE:** 5/14/2007

---

**Specific Capacity Test**

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time (min)</th>
<th>Depth to Water (ft)</th>
<th>Drawdown (ft) (s)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:10</td>
<td>0</td>
<td>9.36</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>static depth to water</td>
</tr>
<tr>
<td>10:11</td>
<td>0</td>
<td>--</td>
<td>--</td>
<td>4.9</td>
<td>3.1</td>
<td>pump on</td>
</tr>
<tr>
<td>10:17</td>
<td>6</td>
<td>10.94</td>
<td>1.58</td>
<td>4.9</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>10:20</td>
<td>9</td>
<td>10.90</td>
<td>1.54</td>
<td>4.9</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>10:23</td>
<td>12</td>
<td>10.89</td>
<td>1.53</td>
<td>5.0</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>10:28</td>
<td>17</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>generator stops- off</td>
</tr>
<tr>
<td>10:39</td>
<td>28</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>pump on</td>
</tr>
<tr>
<td>10:40</td>
<td>29</td>
<td>10.83</td>
<td>1.47</td>
<td>5.0</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>10:43</td>
<td>32</td>
<td>10.91</td>
<td>1.55</td>
<td>5.0</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>10:52</td>
<td>41</td>
<td>11.00</td>
<td>1.64</td>
<td>5.0</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>11:01</td>
<td>50</td>
<td>11.05</td>
<td>1.69</td>
<td>5.0</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>11:02</td>
<td>51</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>pump off</td>
</tr>
</tbody>
</table>

---

**NOTES AND OBSERVATIONS:**
## Column of Water in Well

- **Depth to Bottom (ft)**: 27.1
- **Static Water Level (ft)**: 16.49

- **Pump Depth (ft)**: 15
- **Static Water Level (ft)**: 10.61
- **Well Diameter**: 4 inches
- **Well Volume**: 10.8 gallons
- **Engineer**: A. Gallas
- **Weather**: Sunny
- **Test Date**: 5/1/2006

### Specific Capacity Test

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time (min)</th>
<th>Depth to Water (ft)</th>
<th>Drawdown (ft) (s)</th>
<th>Pumping Rate (gpm) (Q)</th>
<th>Specific Capacity (gpm/ft) (Q/s)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>10.61</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0.20</td>
<td>2</td>
<td>13.43</td>
<td>2.82</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>0.25</td>
<td>5</td>
<td>14.23</td>
<td>3.62</td>
<td>0.225</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>0.31</td>
<td>11</td>
<td>16.19</td>
<td>5.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.36</td>
<td>16</td>
<td>16.56</td>
<td>5.95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.37</td>
<td>17</td>
<td>16.91</td>
<td>6.30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.44</td>
<td>24</td>
<td>17.01</td>
<td>6.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.49</td>
<td>29</td>
<td>17.11</td>
<td>6.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Rising Head Test

- **Pump OFF**

- **Notes**: Pump OFF

### Notes and Observations:

1. Pumping rate lowered to minimum capability.
2. Extracted approximately 3.5 gallons of water.
APPENDIX G – HYDRAULIC CONDUCTIVITY CALCULATIONS
MW-30 TEST 4

Data Set: J:\...\MW-30 test 4.aqt
Date: 09/10/07          Time: 16:39:28

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchana, New York
Test Well: MW-30 (41.5-46.3)
Test Date: 11/22/05

AQUIFER DATA
Saturated Thickness: 300. ft            Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-30)
Initial Displacement: 7. ft
Total Well Penetration Depth: 21.72 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 21.72 ft
Screen Length: 4.8 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined            Solution Method: Hvorslev
K = 1.775 ft/day                    y0 = 6.793 ft
**PROJECT INFORMATION**

**Company:** GZA GeoEnvironmental  
**Client:** Indian Point Energy Center  
**Project:** 41.0017869.10  
**Location:** Buchanan, New York  
**Test Well:** MW-30 (45.0-49.8)  
**Test Date:** 11/22/05

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-30 Test 3)**

Initial Displacement: 10. ft  
Total Well Penetration Depth: 21.73 ft  
Casing Radius: 0.08333 ft

Static Water Column Height: 21.73 ft  
Screen Length: 4.8 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 1.029 ft/day  
y0 = 8.115 ft

**MW-30 TEST 3**

Data Set: J:\...\MW-30 test 3.aqt  
Date: 04/26/07  
Time: 23:10:04
MW-30 TEST 2

Data Set: J:\...\MW-30 test 2.aqt
Date: 04/26/07 Time: 23:10:12

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-30 (48.2-53.0)
Test Date: 11/22/05

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-30 Test 2)
Initial Displacement: 15. ft
Total Well Penetration Depth: 25.53 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 25.53 ft
Screen Length: 4.8 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
\( K = 0.004766 \text{ ft/day} \)
\( y_0 = 14.27 \text{ ft} \)
MW-30 TEST 1

Data Set: J:\...\MW-30 test 1.aqt
Date: 04/26/07
Time: 23:10:19

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-30 (52.3-61.7)
Test Date: 11/22/05

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-30 Test 1)

Initial Displacement: 19.9 ft
Total Well Penetration Depth: 21.15 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 21.15 ft
Screen Length: 9.6 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.0007118 \text{ ft/day} \]
\[ y0 = 19.78 \text{ ft} \]
**MW-31 TEST 7**

Data Set: J:\...\MW-31 test 7.aqt  
Date: 04/19/07  
Time: 14:04:02

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-31 (34.5-43.1)  
Test Date: 01/18/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-31 Test 7)**

Initial Displacement: 10. ft  
Total Well Penetration Depth: 10.45 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 10.45 ft  
Screen Length: 8.6 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.1665 ft/day  
y0 = 9.491 ft
MW-31 PACKERED EXTRACTION (TEST 6)

Data Set: J:\...\MW-31 test 6theis.aqt
Date: 09/10/07 Time: 16:42:33

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-31 (42.9-51.5)
Test Date: 1/18/06

WELL DATA

Pumping Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-31</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Observation Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-31 test6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined

\[ T = 249.6 \text{ ft}^2/\text{day} \]

\[ K_z/K_r = 1 \]

Solution Method: Theis

\[ S = 0.009958 \]

\[ b = 50 \text{ ft} \]
### MW-31 TEST 5

**Data Set:** J:\...\MW-31 test 5.aqt  
**Date:** 04/19/07  
**Time:** 14:02:08

**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental  
- **Client:** Indian Point Energy Center  
- **Project:** 41.0017869.10  
- **Location:** Buchanan, New York  
- **Test Well:** MW-31 (50.9-59.5)  
- **Test Date:** 01/18/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft  
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-31 Test 5)**

- **Initial Displacement:** 7. ft  
- **Total Well Penetration Depth:** 19.5 ft  
- **Casing Radius:** 0.08333 ft  
- **Static Water Column Height:** 19.5 ft  
- **Screen Length:** 8.6 ft  
- **Wellbore Radius:** 0.159 ft

### SOLUTION

- **Aquifer Model:** Unconfined  
- **Solution Method:** Hvorslev  
- **K** = 1.699 ft/day  
- **y0** = 3.654 ft
MW-31 TEST 4

Data Set: J:\...\MW-31 test 4.aqt
Date: 09/10/07
Time: 16:43:37

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-31 (58.4-67.0)
Test Date: 01/18/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-31 Test 4)

Initial Displacement: 11. ft
Total Well Penetration Depth: 34.4 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 34.4 ft
Screen Length: 8.6 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.5041 ft/day
y0 = 16.53 ft
**MW-31 TEST 3**

Data Set: J:\...\MW-31 test 3.aqt
Date: 04/19/07

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-31 (65.4-74.0)
Test Date: 01/18/06

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-31 Test 3)**

Initial Displacement: 27. ft
Total Well Penetration Depth: 41.3 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 41.3 ft
Screen Length: 8.6 ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.3098 \text{ ft/day} \]
\[ y_0 = 30.91 \text{ ft} \]
MW-31 TEST 2
Data Set: J:\...\MW-31 test 2.aqt
Date: 04/19/07  Time: 13:59:09

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-31 (73.4-82.0)
Test Date: 01/17/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-31 Test 2)
Initial Displacement: 21. ft
Total Well Penetration Depth: 48.2 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 48.2 ft
Screen Length: 8.6 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.3396 ft/day
y0 = 17.02 ft
MW-31 TEST 1

Data Set: J:\...\MW-31 test 1.aqt
Date: 04/19/07                Time: 13:58:30

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-31 (79.9-90.0)
Test Date: 01/16/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-31 Test 1)

Initial Displacement: 39.9 ft
Total Well Penetration Depth: 57.2 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 57.2 ft
Screen Length: 10.1 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.2045 ft/day
y0 = 36.58 ft
## PROJECT INFORMATION

<table>
<thead>
<tr>
<th>Company</th>
<th>GZA GeoEnvironmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client</td>
<td>Indian Point Energy Center</td>
</tr>
<tr>
<td>Project</td>
<td>41.0017869.10</td>
</tr>
<tr>
<td>Location</td>
<td>Buchanan, New York</td>
</tr>
<tr>
<td>Test Well</td>
<td>MW-32 (69.4-79.4)</td>
</tr>
<tr>
<td>Test Date</td>
<td>03/30/06</td>
</tr>
</tbody>
</table>

## AQUIFER DATA

<table>
<thead>
<tr>
<th>Saturated Thickness</th>
<th>300. ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anisotropy Ratio (Kz/Kr)</td>
<td>0.1</td>
</tr>
</tbody>
</table>

## WELL DATA (MW-32 Test 8)

<table>
<thead>
<tr>
<th>Initial Displacement</th>
<th>9. ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Well Penetration Depth</td>
<td>11.29 ft</td>
</tr>
<tr>
<td>Casing Radius</td>
<td>0.08333 ft</td>
</tr>
<tr>
<td>Static Water Column Height</td>
<td>11.29 ft</td>
</tr>
<tr>
<td>Screen Length</td>
<td>10. ft</td>
</tr>
<tr>
<td>Wellbore Radius</td>
<td>0.159 ft</td>
</tr>
</tbody>
</table>

## SOLUTION

<table>
<thead>
<tr>
<th>Aquifer Model</th>
<th>Confined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Method</td>
<td>Hvorslev</td>
</tr>
<tr>
<td>$K$ = 0.01648 ft/day</td>
<td></td>
</tr>
<tr>
<td>$y_0 = 23.09$ ft</td>
<td></td>
</tr>
</tbody>
</table>
DATA

**MW-32 TEST 7**

Data Set: J:\...\MW-32 test 7(80-90).aqt  
Date: 04/19/07  
Time: 14:16:09

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-32 (79.4-89.4)  
Test Date: 03/29/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-32 Test 7)**

Initial Displacement: 15. ft  
Total Well Penetration Depth: 21.29 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 21.29 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Confined  
Solution Method: Hvorslev  
K = 0.3127 ft/day  
y0 = 19.68 ft
MW-32 TEST 6

Data Set: J:\...\MW-32 test 6(117-127).aqt
Date: 04/19/07 Time: 14:15:22

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-32 (116.4-126.4)
Test Date: 03/29/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-32 Test 6)

Initial Displacement: 22. ft
Total Well Penetration Depth: 58.29 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 58.29 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev

K = 0.3043 ft/day
y0 = 25.18 ft
MW-32 TEST 5

Data Set: J:\...\MW-32 test 5(131-141).aqt
Date: 04/19/07 Time: 14:14:52

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-32 (130.4-140.4)
Test Date: 03/29/06

AQUIFER DATA
Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-32 Test 5)
Initial Displacement: 15 ft
Total Well Penetration Depth: 72.3 ft
Casing Radius: 0.08333 ft
Screen Length: 10 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Confined
Solution Method: Hvorslev
K = 0.9598 ft/day
y0 = 14.3 ft
**MW-32 TEST 4**

Data Set: J:\...\MW-32 test 4(148-158).aqt  
Date: 04/19/07  
Time: 14:14:21

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-32 (147.4-157.4)  
Test Date: 03/28/06

**AQUIFER DATA**

Saturated Thickness: 300 ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-32 Test 4)**

Initial Displacement: 20 ft  
Total Well Penetration Depth: 89.29 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 89.29 ft  
Screen Length: 10 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.407 ft/day  
y0 = 20.14 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-32 (169.4-179.4)  
Test Date: 03/27/06

**AQUIFER DATA**

Saturated Thickness: 50. ft  
Anisotropy Ratio (Kz/Kr): 1.

**WELL DATA (MW-32 Test 3)**

Initial Displacement: 15. ft  
Total Well Penetration Depth: 111.3 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 111.3 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 1.052 ft/day  
y0 = 17.1 ft
MW-32 TEST 2

Data Set: J:\...\MW-32 test 2(175-185).aqt
Date: 04/19/07 Time: 14:13:15

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-32 (184.4-174.4)
Test Date: 03/27/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-32 Test 2)

Initial Displacement: 4. ft
Total Well Penetration Depth: 116.3 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 116.3 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.1493 \text{ ft/day} \]

\[ y_0 = 2.846 \text{ ft} \]
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<th>Time (sec)</th>
<th>Normalized Head (ft/ft)</th>
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**MW-32 TEST 1**

| Data Set: J:\...\MW-32 test 1(195-185).agt |
| Date: 04/19/07 | Time: 14:12:28 |

**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-32 (184.4-194.4)
- **Test Date:** 03/27/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-32 Test 1)**

- **Initial Displacement:** 28. ft
- **Total Well Penetration Depth:** 126.3 ft
- **Casing Radius:** 0.08333 ft
- **Static Water Column Height:** 126.3 ft
- **Screen Length:** 10. ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.3628 ft/day
- **y0:** 32.07 ft
MW-33 EXTRACTION TEST

Data Set: J:\...\sy33 MW33.aqt
Date: 09/11/07 Time: 18:39:06

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-33
Test Date: 3/8/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-33)

Initial Displacement: 7.155 ft
Total Well Penetration Depth: 20. ft
Casing Radius: 0.159 ft
Static Water Column Height: 21. ft
Screen Length: 20. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.5475 ft/day
y0 = 6.382 ft
MW-34 EXTRACTION TEST

Data Set: J:\...\sy34 MW34.aqt
Date: 09/11/07  Time: 18:39:25

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-34
Test Date: 3/8/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-34)

Initial Displacement: 5.7 ft
Total Well Penetration Depth: 20. ft
Casing Radius: 0.159 ft
Screen Length: 20. ft
Wellbore Radius: 0.159 ft
Static Water Column Height: 21. ft

SOLUTION

Aquifer Model: Unconfined
K = 0.4468 ft/day
Solution Method: Hvorslev
y0 = 5.364 ft
MW-35 EXTRACTION TEST

Data Set: J:\...\sy35 MW35.aqt
Date: 09/11/07 Time: 18:39:56

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-35
Test Date: 1/24/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-35)

Initial Displacement: 10. ft
Total Well Penetration Depth: 20. ft
Casing Radius: 0.159 ft
Static Water Column Height: 23. ft
Screen Length: 20. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.467 ft/day
y0 = 7.757 ft
MW-36-41 SLUG TEST (RISING)

Data Set: J:\...\MW-36-41rising.aqt
Date: 04/20/07  Time: 16:43:31

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-36-41
Test Date: 4/4/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36-41)

Initial Displacement: 2. ft  Static Water Column Height: 36. ft
Total Well Penetration Depth: 36. ft  Screen Length: 10. ft
Casing Radius: 0.04167 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.2385 ft/day  y0 = 2.035 ft
MW-36-41 SLUG TEST

Data Set: J:\...\MW-36-41Jan07.aqt
Date: 04/20/07 Time: 16:43:58

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-36-41
Test Date: 1/3/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36-41)

Initial Displacement: 9.2 ft
Total Well Penetration Depth: 36. ft
Casing Radius: 0.04167 ft
Static Water Column Height: 37. ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.1094 \text{ ft/day} \]
\[ y_0 = 8.072 \text{ ft} \]
MW-36-53 SLUG TEST (RISING)

Data Set: J: \...\MW-36-53rising.aqt
Date: 04/20/07  Time: 16:44:50

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-36-53
Test Date: 4/15/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-36-53)

Initial Displacement: 2. ft  Static Water Column Height: 47. ft
Total Well Penetration Depth: 47. ft  Screen Length: 7. ft
Casing Radius: 0.04167 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.1165 ft/day  y0 = 1.762 ft
**MW-36-53 SLUG TEST**

Data Set: J:\...\MW-36-53Jan07.aqt  
Date: 04/20/07  
Time: 16:45:11

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-36-53  
Test Date: 1/4/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-36-53)**

Initial Displacement: 32.45 ft  
Total Well Penetration Depth: 48.6 ft  
Casing Radius: 0.04167 ft  
Static Water Column Height: 48.6 ft  
Screen Length: 7. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.09468 ft/day  
y0 = 35.02 ft
MW-37-32 SLUG TEST (RISE)

Data Set: J:\...\MW-37-32rising.aqt
Date: 04/20/07 Time: 16:49:11

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-37-32
Test Date: 4/4/06

AQUIFER DATA
Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-37-32)
Initial Displacement: 1. ft Static Water Column Height: 22. ft
Total Well Penetration Depth: 22. ft Screen Length: 5.5 ft
Casing Radius: 0.04167 ft Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined Solution Method: Hvorslev
K = 25.76 ft/day y0 = 0.8789 ft
**MW-37-40 SLUG TEST**

Data Set: J:\...\MW-37-40Jan07.aqt  
Date: 04/20/07  
Time: 16:49:43

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-37-40  
Test Date: 1/4/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-37-40)**

Initial Displacement: 19.55 ft  
Total Well Penetration Depth: 32.2 ft  
Casing Radius: 0.04167 ft  
Static Water Column Height: 32.2 ft  
Screen Length: 3.5 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.004677 ft/day  
y0 = 19.41 ft
MW-37-57 SLUG TEST (RISING)

Data Set: J:\...\MW-37-57rising.aqt
Date: 09/11/07  Time: 18:47:47

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-37-57
Test Date: 4/4/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-37-57)

Initial Displacement: 3. ft
Total Well Penetration Depth: 48. ft
Casing Radius: 0.04167 ft
Static Water Column Height: 48. ft
Screen Length: 7. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
$K = 2.48 \text{ ft/day}$
$y0 = 1.774 \text{ ft}$
**MW-37-57 PNEUMATIC SLUG TEST**

Data Set: J:\...\MW-37-57Jan07.aqt
Date: 09/11/07  Time: 18:48:05

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-37-57  
Test Date: 1/3/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-37-57)**

Initial Displacement: 31.03 ft  
Static Water Column Height: 48. ft  
Total Well Penetration Depth: 48. ft  
Screen Length: 7. ft  
Casing Radius: 0.04167 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 1.14 \text{ ft/day} \]  
\[ y_0 = 30.48 \text{ ft} \]
Estimate Transmissivity from Specific Capacity Data

\[ R_w := 0.167 \quad \text{Radius of Well (FT.)} \]

\[ S_w := 0.25 \quad \text{Storage Coefficient, Assumed} \]

\[ t := \frac{50}{1440} \quad \text{Pumping Duration (Days.)} \]

\[ T_w := 100 \quad \text{Transmissivity (GPD/FT) Initial Guess} \]

\[ Q_p := 7.9 \quad \text{Pumping Rate (GPM)} \]

\[ S_p := 1.36 \quad \text{Drawdown (FT.)} \]

\[ \frac{Q_p}{s} = 5.809 \quad \text{Specific Capacity (GPM/FT)} \]

\[
aT := \sqrt{\frac{T}{264 \cdot \log \left( \frac{0.3 \cdot T - t}{R^2 \cdot S} \right)}} \]

Groundwater Resource Evaluation

\[ T := aT \]

\[ T_{ft} := \frac{T}{7.48} \quad \text{Computed Transmissivity (GPD/ Ft)} \]

\[ T_{ft} = 811 \quad \text{Computed Transmissivity (Sq.ft./Day)} \]
MWM-39 T12 PACKERED EXTRACTION

Data Set: J:\...\MW-39 t12 theis.aqt
Date: 09/10/07

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-39
Test Date: 4/19/06

WELL DATA

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>X (ft)</th>
<th>Y (ft)</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
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<td>Well Name</td>
</tr>
<tr>
<td>MW-39</td>
<td>0</td>
<td>0</td>
<td>MW-39</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 121.6 ft²/day
Kz/Kr = 1
S = 0.00291
b = 300. ft
**MW-39 TEST 11**

Data Set: J:\...\MW-39 t11.aqt  
Date:  04/19/07  
Time:  14:35:02

---

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-39 (69.5-79.5)  
Test Date: 04/19/06

---

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

---

**WELL DATA (MW-39 T11)**

Initial Displacement: 7. ft  
Total Well Penetration Depth: 21.71 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 21.71 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

---

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.5746 \text{ ft/day} \]  
\[ y_0 = 9.952 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, NY  
Test Well: MW-39  
Test Date: 4/19/06

**WELL DATA**

<table>
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<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
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</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-39</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Theis  

\[
T = 24.88 \text{ ft}^2/\text{day}  
S = 9.701E-6  
Kz/Kr = 1.  
b = 300. \text{ ft}
\]
MW-39 TEST 10

Data Set: J:\...\MW-39 t10.aqt
Date: 04/19/07  Time: 14:33:13

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (79.5-89.5)
Test Date: 04/19/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 T10)
Initial Displacement: 13. ft
Total Well Penetration Depth: 31.71 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 31.71 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 1.545 ft/day
y0 = 13.98 ft
MW-39 TEST 9

Data Set: J:\...\MW-39 t9.aqt
Date: 04/19/07 Time: 14:31:11

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (89.3-99.3)
Test Date: 04/13/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 Test 9)

Initial Displacement: 19. ft
Total Well Penetration Depth: 46.8 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 46.8 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
\( K = 0.5113 \text{ ft/day} \)
\( y_0 = 25.24 \text{ ft} \)
MW-39 T8 PACKERED EXTRACTION

Data Set: J:\...\MW-39 t8 theis.aqt
Date: 09/10/07  Time: 16:49:25

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-39
Test Date: 4/11/06

WELL DATA

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<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-39</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 127.9 \text{ ft}^2/\text{day} \]
\[ S = 0.04799 \]
\[ K_z/K_r = 1 \]
\[ b = 300 \text{ ft} \]
MW-39 T7 PACKERED EXTRACTION

Data Set: J:...\MW-39 t7 theis.aqt
Date: 09/10/07

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-39
Test Date: 4/10/06

WELL DATA

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<th>X (ft)</th>
<th>Y (ft)</th>
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</thead>
<tbody>
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<table>
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<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-39</td>
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<td>0</td>
</tr>
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</table>

SOLUTION
Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 22.74 \text{ ft}^2/\text{day} \]
\[ K_z/K_r = 1 \]
\[ S = 0.0001326 \]
\[ b = 300 \text{ ft} \]
**MW-39 TEST 6**

Data Set: J:\...\MW-39 t6.aqt
Date: 04/19/07
Time: 14:29:09

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (129.0-139.0)
Test Date: 04/10/06

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-39 Test 6)**

Initial Displacement: 13.5 ft
Total Well Penetration Depth: 81.88 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 81.88 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.01631 ft/day
y0 = 13.19 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-39 (139.2-149.2)  
Test Date: 04/6/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-39 Test 5)**

Initial Displacement: 11. ft  
Total Well Penetration Depth: 92.08 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 92.08 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.06719 \text{ ft/day}, \quad y_0 = 12.16 \text{ ft} \]
0. 1000. 2.0E+3 3.0E+3 4.0E+3 5.0E+3
0.1
1.
0. 1000. 2.0E+3 3.0E+3 4.0E+3 5.0E+3

MW-39 TEST 4
Data Set: J:\...
MW-39 t4.aqt
Date: 04/19/07
Time: 14:28:20

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (152.2-162.2)
Test Date: 04/6/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 Test 4)
Initial Displacement: 8.5 ft
Total Well Penetration Depth: 105.1 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 105.1 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.01934 ft/day
y0 = 8.472 ft
MW-39 TEST 3
Data Set: J:\...\MW-39 T3.aqt
Date: 04/19/07  Time: 14:27:14

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (165.0-175.0)
Test Date: 04/6/06

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 Test 3)
Initial Displacement: 23. ft  Static Water Column Height: 117.9 ft
Total Well Penetration Depth: 117.9 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.00452 ft/day  y0 = 21.34 ft
MW-39 TEST 2

Data Set: J:\...\MW-39 T2.aqt
Date: 04/19/07  Time: 14:26:05

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (175.0-185.0)
Test Date: 04/5/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 Test 2)

Initial Displacement: 20. ft  Static Water Column Height: 127.9 ft
Total Well Penetration Depth: 127.9 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.5784 ft/day  y0 = 39.77 ft
MW-39 TEST 1

Data Set: J:\...\MW-39 t1.aqt
Date: 04/19/07          Time: 14:25:30

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-39 (183.2-193.2)
Test Date: 04/5/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-39 Test 1)

Initial Displacement: 20. ft
Total Well Penetration Depth: 136.1 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 136.1 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.6907 ft/day
y0 = 28.68 ft
**MW-40 T12 PACKERED EXTRACTION**

Data Set: J:\...\MW-40 t12 theis.aqt
Date: 09/10/07
Time: 16:53:28

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-40
Test Date: 5/16/06

**WELL DATA**

<table>
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<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-40</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Theis

\[
T = 74.05 \, \text{ft}^2/\text{day}
\]

\[
S = 0.01628
\]

\[
Kz/Kr = 1
\]

\[
b = 300, \, \text{ft}
\]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (28.0-38.0)  
Test Date: 5/16/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-40 T11)**

Initial Displacement: 20. ft  
Total Well Penetration Depth: 21.74 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 21.74 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\( K = 1.074 \text{ ft/day} \)  
\( y_0 = 12.98 \text{ ft} \)
MW-40 TEST 10

Data Set: J:\...\MW-40 t10.aqt
Date: 09/10/07 Time: 16:56:15

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-40 (34.0-44.0)
Test Date: 5/15/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 T10)
Initial Displacement: 12. ft
Total Well Penetration Depth: 27.74 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 27.74 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.6442 ft/day
y0 = 11.76 ft
MW-40 TEST 9

Data Set: J:\...\MW-40 t9.aqt  
Date: 09/10/07  
Time: 16:56:02

PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (44.0-54.0)  
Test Date: 5/15/06

AQUIFER DATA

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 9)

Initial Displacement: 10.5 ft  
Total Well Penetration Depth: 37.85 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 37.85 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.1007 ft/day  
y0 = 10.52 ft
**MW-40 TEST 8**

Data Set: J:\..\MW-40 t8.aqt  
Date: 04/19/07  
Time: 15:53:18

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (52.0-62.0)  
Test Date: 5/15/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-40 Test 8)**

Initial Displacement: 11.5 ft  
Total Well Penetration Depth: 45.85 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 45.85 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.08836 ft/day  
y0 = 11. ft
MW-40 TEST7

Data Set: J:\...\MW-40 t7.aqt
Date: 09/10/07  Time: 16:55:46

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-40 (62.5-72.5)
Test Date: 5/15/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 1)

Initial Displacement: 12.8 ft  Static Water Column Height: 56.45 ft
Total Well Penetration Depth: 56.45 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.1403 ft/day  y0 = 12.13 ft
MW-40 TEST 6

Data Set: J:\...\MW-40 t6.aqt
Date: 09/10/07  Time: 16:55:31

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-40 (80.0-90.0)
Test Date: 5/12/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 6)
Initial Displacement: 11.7 ft
Total Well Penetration Depth: 74.4 ft
Casing Radius: 0.08333 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.2067 ft/day
y0 = 11.59 ft
MW-40 TEST 5
Data Set: J:\...\MW-40 t5.aqt
Date: 04/19/07 Time: 15:51:04

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-40 (95.0-105.0)
Test Date: 5/11/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 5)
Initial Displacement: 15. ft
Total Well Penetration Depth: 88.87 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 88.87 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.2608 ft/day
y0 = 13.4 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (127.0-137.0)  
Test Date: 5/11/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-40 Test 4)**

Initial Displacement: 11. ft  
Total Well Penetration Depth: 120.9 ft  
Static Water Column Height: 120.9 ft  
Casing Radius: 0.08333 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.2339 ft/day  
y0 = 11.31 ft
MW-40 TEST 3

Data Set: J:\...\MW-40 t3.aqt  
Date: 04/19/07  
Time: 15:50:04

PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (146.0-156.0)  
Test Date: 5/11/06

AQUIFER DATA

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 3)

Initial Displacement: 11. ft  
Total Well Penetration Depth: 139.9 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 139.9 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.3075 ft/day  
y0 = 13.18 ft
MW-40 TEST 2

Data Set: J:\..\MW-40 t2.aqt
Date: 09/10/07       Time: 16:55:08

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-40 (160.0-170.0)
Test Date: 5/10/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-40 Test 2)
Initial Displacement: 11.5 ft
Total Well Penetration Depth: 154. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 154. ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.0918 ft/day
y0 = 11.48 ft
**MW-40 TEST 1**

Data Set: J:\...\MW-40 t1.aqt  
Date: 09/10/07  
Time: 16:54:53

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-40 (178.0-188.0)  
Test Date: 5/10/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-40 Test 1)**

Initial Displacement: 20. ft  
Total Well Penetration Depth: 136.1 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 136.1 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.03516 \text{ ft/day} \]  
\[ y_0 = 19.95 \text{ ft} \]
MW-41-64 SLUG TEST (RISING)

Data Set: J:\...\MW-41-64rising.aqt
Date: 04/23/07  Time: 14:38:48

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-41-64
Test Date: 5/2/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-41-64)
Initial Displacement: 1. ft
Total Well Penetration Depth: 9. ft
Casing Radius: 0.04167 ft
Static Water Column Height: 64. ft
Screen Length: 9. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 21.9 ft/day
y0 = 3.392 ft
MW-41-42 SLUG TEST (RISING)

Data Set: J:\...\MW-41-42rising.aqt
Date: 09/11/07          Time: 18:49:26

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-41-42
Test Date: 5/11/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-41-42)

Initial Displacement: 14.08 ft
Total Well Penetration Depth: 22.46 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 22.46 ft
Screen Length: 22.46 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
\( K = 0.03638 \text{ ft/day} \)
\( y_0 = 14.68 \text{ ft} \)
**MW-42-51 EXTRACTION**

Data Set: J:\\...\sy42-51 theis.aqt
Date: 09/11/07
Time: 18:50:30

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-42-51
Test Date: 5/30/06

**WELL DATA**

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-42-51</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 12.64 \text{ ft}^2/\text{day} \]
\[ K_z/K_r = 1 \]
\[ S = 0.00076 \]
\[ b = 50. \text{ ft} \]
MW-42-51 RISING HEAD TEST

Data Set: J:\...\MW42-51 rising head.aqt
Date: 04/24/07 Time: 09:27:43

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-42-51
Test Date: 5/30/06

AQUIFER DATA

Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-42-51)

Initial Displacement: 12.42 ft
Total Well Penetration Depth: 14.37 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 14.37 ft
Screen Length: 14.37 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.5196 \text{ ft/day} \]
\[ y_0 = 11.95 \text{ ft} \]
MW-42-79 SLUG TEST (RISING)

Data Set: J:\...\MW-42-79rising.aqt
Date: 04/23/07 Time: 16:05:13

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-42-79
Test Date: 4.27/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-42-79)

Initial Displacement: 1. ft
Total Well Penetration Depth: 46. ft
Casing Radius: 0.04167 ft
Static Water Column Height: 46. ft
Screen Length: 12. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 1.97 ft/day
y0 = 0.5766 ft
MW-43-28 RISING HEAD TEST

Data Set: J:\...\MW43-28 recovery.aqt
Date: 09/11/07 Time: 18:54:48

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-43-28
Test Date: 5/23/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-43-28)

Initial Displacement: 5.6 ft
Total Well Penetration Depth: 14.48 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 14.48 ft
Screen Length: 14.48 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.4494 ft/day
y0 = 5.478 ft
Solution Method: Hvorslev
MW-43-62 EXTRACTION

Data Set: J:\...\sy43-62 theis.aqt
Date: 09/11/07
Time: 18:55:19

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-43-62
Test Date: 5/22/06

WELL DATA

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-43-62</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-43-62</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 3.594 \text{ ft}^2/\text{day} \]
\[ S = 0.001003 \]
\[ Kz/Kr = 1 \]
\[ b = 50. \text{ ft} \]
MW-43-62 RISING HEAD TEST

Data Set: J:\...\MW43-62 rising head.aqt
Date: 09/11/07  Time: 18:55:52

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-43-62
Test Date: 5/22/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-43-62)

Initial Displacement: 31.52 ft
Total Well Penetration Depth: 49.4 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 46.4 ft
Screen Length: 25. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
K = 0.03067 ft/day
Solution Method: Hvorslev
y0 = 32.91 ft
Estimate Transmissivity from Specific Capacity Data

\[ R_s := 0.167 \quad \text{Radius of Well (FT.)} \]
\[ S_s := 0.01 \quad \text{Storage Coefficient, Assumed} \]
\[ t := \frac{27}{1440} \quad \text{Pumping Duration (Days.)} \]
\[ T := 100 \quad \text{Transmissivity (GPD/FT) Initial Guess} \]
\[ Q_p := 0.337 \quad \text{Pumping Rate (GPM)} \]
\[ S_p := 3.8 \quad \text{Drawdown (FT.)} \]
\[ \frac{Q_p}{s} = 0.089 \quad \text{Specific Capacity (GPM/FT)} \]

\[ aT := \sqrt{\frac{Q_p}{s} = \frac{T}{264 \log \left( \frac{0.3 \cdot T \cdot t}{R^2 \cdot S} \right)}} \]

\[ T = 74 \quad \text{Computed Transmissivity (GPD/FT)} \]
\[ T_{ft} := \frac{T}{7.48} \quad \text{Computed Transmissivity (Sq.ft./Day)} \]

---

Groundwater Resource Evaluation
MW-44-104 PNEUMATIC SLUG (TEST2)

Data Set: J:\...\MW-44-104 T2.aqt
Date: 09/11/07 Time: 18:57:40

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-44-104
Test Date: 5/8/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-44-104)

Initial Displacement: 8.325 ft
Total Well Penetration Depth: 37.22 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 37.22 ft
Screen Length: 28. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.09192 \text{ ft/day} \]
\[ y_0 = 7.959 \text{ ft} \]
**MW-45-43 EXTRACTION**

Data Set: J:\...\sy45-43 mw45-43 theis.aqt  
Date: 09/11/07  
Time: 18:59:02

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, NY  
Test Well: MW-45-43  
Test Date: 5/24/06

**WELL DATA**

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-45-43</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Theis  
\[ T = 0.09019 \text{ ft}^2/\text{day} \]  
\[ S = 0.0001136 \]  
\[ K_z/K_r = 1. \]  
\[ b = 300. \text{ ft} \]
## PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-45-62  
Test Date: 5/7/07

## AQUIFER DATA

- Saturated Thickness: 300 ft  
- Anisotropy Ratio (Kz/Kr): 0.1

## WELL DATA (MW-45-62)

- Initial Displacement: 16.2 ft  
- Total Well Penetration Depth: 40.54 ft  
- Casing Radius: 0.08333 ft  
- Static Water Column Height: 40.54 ft  
- Screen Length: 14.5 ft  
- Wellbore Radius: 0.159 ft

## SOLUTION

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- \( K = 0.1979 \text{ ft/day} \)  
- \( y_0 = 15.85 \text{ ft} \)
MW-46 EXTRACTION TEST RECOVERY

Data Set: J:\...\SY MW-46 recovery.aqt
Date: 07/01/07  Time: 17:57:12

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-46
Test Date: 5/23/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-46)
Initial Displacement: 6.544 ft
Total Well Penetration Depth: 25.68 ft
Casing Radius: 0.159 ft
Static Water Column Height: 25.68 ft
Screen Length: 25.68 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
\[ K = 0.1029 \text{ ft/day} \]
\[ y_0 = 12.24 \text{ ft} \]
MW-47-80 SLUG TEST (RISING)

Data Set: J:\...\MW-47-80rising.aqt
Date: 04/24/07  Time: 08:32:40

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-47-80
Test Date: 5/2/06

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-47-80)
Initial Displacement: 2. ft
Total Well Penetration Depth: 12. ft
Casing Radius: 0.04167 ft

Static Water Column Height: 80. ft
Screen Length: 12. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
$K = 1.367 \text{ ft/day}$  $y_0 = 1.673 \text{ ft}$
Estimate Transmissivity from Specific Capacity Data

\[
R := 0.159 \quad \text{Radius of Well (FT.)}
\]

\[
S := 0.25 \quad \text{Storage Coefficient, Assumed}
\]

\[
t := \frac{48}{1440} \quad \text{Pumping Duration (Days.)}
\]

\[
T := 100 \quad \text{Transmissivity (GPD/FT) Initial Guess}
\]

\[
Q_p := 2.22 \quad \text{Pumping Rate (GPM)}
\]

\[
s := 3 \quad \text{Drawdown (FT.)}
\]

\[
\frac{Q_p}{s} = 0.74 \quad \text{Specific Capacity (GPM/FT)}
\]

\[
aT := \sqrt{\frac{Q_p}{s} - \frac{T}{264 \cdot \log\left(\frac{0.3 \cdot T \cdot t}{R^2 \cdot s}\right)}}
\]

\[
T := \frac{aT}{579} \quad \text{Computed Transmissivity (GPD/ Ft)}
\]

\[
T_f := \frac{T}{7.48} \quad \text{Computed Transmissivity (Sq.ft./Day)}
\]

Groundwater Resource Evaluation
MW-48-38 PNEUMATIC SLUG TEST 1
Data Set: J:\...\MW-48-38 T1.aqt
Date: 07/01/07 Time: 18:00:29

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-48-38
Test Date: 5/25/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-48-38)
Initial Displacement: 11.52 ft
Total Well Penetration Depth: 25.36 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 25.36 ft
Screen Length: 8. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 2.496 ft/day
y0 = 11.07 ft
MW-49-42 PNEUMATIC SLUG (TEST1)

Data Set: J:\...\MW-49-42 T1.aqt
Date: 07/01/07 Time: 18:03:04

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-49-42
Test Date: 5/9/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-49-42 T1)
Initial Displacement: 8.874 ft
Total Well Penetration Depth: 32. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 32. ft
Screen Length: 13. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 6.218 ft/day
y0 = 8.639 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-49-66  
Test Date: 5/4/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-49-66 T1)**

Initial Displacement: 14.28 ft  
Total Well Penetration Depth: 52.32 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 52.32 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 6.209 \text{ ft/day} \]  
\[ y_0 = 12.92 \text{ ft} \]
**MW-49-66 PNEUMATIC SLUG (TEST2)**

Data Set: J:\...\MW-49-65 T2.aqt  
Date: 07/01/07  
Time: 18:03:57

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-49-66  
Test Date: 5/4/07

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-49-66 T2)**

- Initial Displacement: 39.39 ft  
- Total Well Penetration Depth: 52.32 ft  
- Casing Radius: 0.08333 ft  
- Static Water Column Height: 52.32 ft  
- Screen Length: 10. ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- \( K = 5.063 \text{ ft/day} \)  
- \( y_0 = 29.85 \text{ ft} \)
Estimate Transmissivity from Specific Capacity Data

\[
\begin{align*}
\text{Radius of Well (FT)} & = R_w = 0.159 \\
\text{Storage Coefficient, Assumed} & = S_w = 0.01 \\
\text{Pumping Duration (Days)} & = t = \frac{30}{1440} \\
\text{Transmissivity (GPD/FT) Initial Guess} & = T_w = 100 \\
\text{Pumping Rate (GPM)} & = Q_p = 1.25 \\
\text{Drawdown (FT)} & = s_x = 2.03 \\
\text{Specific Capacity (GPM/FT)} & = \frac{Q_p}{s} = 0.616 \\
\end{align*}
\]

\[
\begin{align*}
\alpha T := & \sqrt{\frac{Q_p}{s} \cdot \frac{T}{264 \cdot \log \left( \frac{0.3 \cdot T \cdot t}{R^2 \cdot s} \right)}} \\
T_w := & \alpha T \\
T_{ft} := & \frac{T}{7.48} \quad \text{Computed Transmissivity (GPD/Ft)} \\
T_{ft} := & 92 \quad \text{Computed Transmissivity (Sq.ft./Day)}
\end{align*}
\]
Estimate Transmissivity from Specific Capacity Data

\[ R := 0.159 \quad \text{Radius of Well (FT.)} \]

\[ S_s := 0.001 \quad \text{Storage Coefficient, Assumed} \]

\[ t := \frac{30}{1440} \quad \text{Pumping Duration (Days.)} \]

\[ T := 100 \quad \text{Transmissivity (GPD/FT) Initial Guess} \]

\[ Q_p := 0.03 \quad \text{Pumping Rate (GPM)} \]

\[ s := 4.46 \quad \text{Drawdown (FT.)} \]

\[ \frac{Q_p}{s} = 6.726 \times 10^{-3} \quad \text{Specific Capacity (GPM/FT)} \]

\[ aT := \sqrt{\frac{Q_p}{s} - \frac{T}{264 \log \left( \frac{0.3 \cdot T \cdot t}{R^2 \cdot S} \right)}} \quad \text{Groundwater Resource Evaluation William C. Walton McGraw-Hill 1970} \]

\[ T := aT \]

\[ T_{ft} := \frac{T}{7.48} \quad \text{T = 6 \quad Computed Transmissivity (GPD/ Ft)} \]

\[ T_{ft} = 1 \quad \text{Computed Transmissivity (Sq.ft./Day)} \]
MW50-67 SLUG TEST

Data Set: J:\...\MW50-67.aqt
Date: 09/12/07 Time: 14:09:38

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW50-67
Test Date: 1/2/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-50-67)

Initial Displacement: 14.87 ft
Total Well Penetration Depth: 67. ft
Screen Length: 7. ft
Casing Radius: 0.04167 ft
Wellbore Radius: 0.159 ft

Static Water Column Height: 67. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.2436 ft/day
y0 = 15.32 ft
Estimate Transmissivity from Specific Capacity Data

\[
R_r := 0.159 \quad \text{Radius of Well (FT.)}
\]

\[
S_u := 0.001 \quad \text{Storage Coefficient, Assumed}
\]

\[
t := \frac{70}{1440} \quad \text{Pumping Duration (Days.)}
\]

\[
T_t := 100 \quad \text{Transmissivity (GPD/FT) Initial Guess}
\]

\[
Q_p := 1.0 \quad \text{Pumping Rate (GPM)}
\]

\[
s := 16 \quad \text{Drawdown (FT.)}
\]

\[
\frac{Q_p}{s} = 0.063 \quad \text{Specific Capacity (GPM/FT)}
\]

\[
aT := \text{root}\left(\frac{Q_p}{s} - \frac{T}{264\cdot \log\left(\frac{0.3\cdot T\cdot t}{R^2 \cdot S}\right)}, T\right)
\]

\[
T_t := aT
\]

\[
T = 77 \quad \text{Computed Transmissivity (GPD/Ft)}
\]

\[
T_{ft} := \frac{T}{7.48}
\]

\[
T_{ft} = 10 \quad \text{Computed Transmissivity (Sq.ft./Day)}
\]
### PROJECT INFORMATION
- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-51 (38.7-29)
- **Test Date:** 5/24/06

### AQUIFER DATA
- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-51 T15)
- **Initial Displacement:** 15.8 ft
- **Total Well Penetration Depth:** 11.41 ft
- **Casing Radius:** 0.08333 ft
- **Static Water Column Height:** 11.41 ft
- **Screen Length:** 10. ft
- **Wellbore Radius:** 0.159 ft

### SOLUTION
- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K = 0.1704 ft/day**
- **y0 = 182.4 ft**
MW-51 TEST 14
Data Set: \texttt{J:\...\MW-51 t14.aqt}
Date: 09/10/07  Time: 17:01:57

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (49.2-39.5)
Test Date: 5/24/06

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 T14)
Initial Displacement: 18.67 ft  Static Water Column Height: 21.98 ft
Total Well Penetration Depth: 21.98 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
$K = 0.3938$ ft/day  $y_0 = 76.94$ ft
**PROJECT INFORMATION**

**Company:** GZA GeoEnvironmental  
**Client:** Indian Point Energy Center  
**Project:** 41.0017869.10  
**Location:** Buchanan, New York  
**Test Well:** MW-51 (59.7-50)  
**Test Date:** 5/24/06

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-51 T13)**

- Initial Displacement: 24.59 ft  
- Static Water Column Height: 32.34 ft  
- Total Well Penetration Depth: 32.34 ft  
- Screen Length: 10. ft  
- Casing Radius: 0.08333 ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- $K = 0.06621$ ft/day  
- $y_0 = 22.71$ ft
RAW TEXT

0. 18. 36. 54. 72. 90.

0.01

0.1

1.

0. 18. 36. 54. 72. 90.

Normalized Head (ft/ft)

Time (min)

MW-51 TEST 12

Data Set: J:\...\MW-51 t12.aqt
Date: 09/10/07

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (87.5-77.8)
Test Date: 5/23/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 T12)

Initial Displacement: 21.17 ft
Total Well Penetration Depth: 46.97 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 46.97 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.07326 ft/day
y0 = 21.28 ft
MW-51 TEST 11

Data Set: J:\...\MW-51 t11.aqt
Date: 04/19/07  Time: 16:11:37

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (87.5-77.8)
Test Date: 5/23/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 T11)

Initial Displacement: 20.12 ft  Static Water Column Height: 60.29 ft
Total Well Penetration Depth: 60.29 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.07544 ft/day  y0 = 21.29 ft
MW-51 TEST 10

Data Set: J:\...\MW-51 t10.aqt
Date: 04/19/07     Time: 16:11:14

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (98.5-88.8)
Test Date: 5/23/06

AQUIFER DATA
Saturated Thickness: 300. ft     Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 T10)
Initial Displacement: 14.97 ft
Total Well Penetration Depth: 71.42 ft
Casing Radius: 0.08333 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.2204 ft/day
y0 = 15.07 ft
**MW-51 TEST 9**

Data Set: J:\...\MW-51 t9.aqt  
Date: 04/19/07  Time: 16:10:44

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-51 (109.7-100)  
Test Date: 5/22/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-51 Test 9)**

Initial Displacement: 10.18 ft  
Total Well Penetration Depth: 82.03 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 82.03 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$$K = 0.1583 \text{ ft/day} \quad y_0 = 9.864 \text{ ft}$$
**MW-51 TEST 8**

Data Set: J:...\MW-51 t8.aqt

Date: 04/19/07  Time: 16:10:02

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (119-109.3)
Test Date: 5/22/06

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-51 Test 8)**

Initial Displacement: 18.75 ft
Total Well Penetration Depth: 90.94 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 90.94 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  Solution Method: Hvorslev

$K = 0.03628 \text{ ft/day}$

$y_0 = 18.71 \text{ ft}$
MW-51 TEST 7

Data Set: J:\...\MW-51 t7.aqt
Date: 04/19/07
Time: 16:09:22

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (130.1-120.4)
Test Date: 5/22/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 7)

Initial Displacement: 18.75 ft
Total Well Penetration Depth: 103.2 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 103.2 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.03628 ft/day
y0 = 18.71 ft
MW-51 TEST 6

Data Set: J:\...\MW-51 t6.aqt
Date: 04/19/07          Time: 16:08:53

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (141.2-131.5)
Test Date: 5/19/06

AQUIFER DATA
Saturated Thickness: 300. ft      Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 6)
Initial Displacement: 15.35 ft      Static Water Column Height: 113.1 ft
Total Well Penetration Depth: 113.1 ft
Casing Radius: 0.08333 ft      Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined      Solution Method: Hvorslev
K = 0.08191 ft/day      y0 = 15.62 ft
MW-51 TEST 5
Data Set: J:\...\MW-51 t5.aqt
Date: 04/19/07 Time: 16:08:06

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (153.1-143.4)
Test Date: 5/19/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 5)
Initial Displacement: 21.09 ft
Total Well Penetration Depth: 125.8 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 125.8 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.05165 ft/day
y0 = 20.81 ft
MW-51 TEST 4

Data Set: J:\...\MW-51 t4.aqt
Date: 04/19/07 Time: 16:07:12

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (163.6-153.9)
Test Date: 5/19/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 4)

Initial Displacement: 21.09 ft
Total Well Penetration Depth: 136.6 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 136.6 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.0752 \text{ ft/day} \]
\[ y_0 = 21.4 \text{ ft} \]
MW-51 TEST 3

Data Set: J:\...\MW-51 t3.aqt
Date: 04/26/07  Time: 23:13:22

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (167.5-157.8)
Test Date: 5/18/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 3)

Initial Displacement: 22.34 ft  Static Water Column Height: 139.3 ft
Total Well Penetration Depth: 139.3 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.1463 ft/day  y0 = 22.43 ft
**MW-51 TEST 2**

Data Set: J:\...\MW-51 t2.aqt
Date: 04/19/07  
Time: 16:06:24

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-51 (173.3-183.0)  
Test Date: 5/18/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-51 Test 2)**

Initial Displacement: 20.54 ft  
Total Well Penetration Depth: 156.1 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 156.1 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.1382 \text{ ft/day} \]  
\[ y_0 = 21.34 \text{ ft} \]
MW-51 TEST 1

Data Set: J:\...\MW-51 t1.aqt
Date: 04/19/07
Time: 16:05:25

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-51 (184.6-194.3)
Test Date: 5/18/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-51 Test 1)

Initial Displacement: 17.57 ft
Total Well Penetration Depth: 166.4 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 166.4 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

$K = 0.1904$ ft/day
$y_0 = 17.96$ ft
Estimate Transmissivity from Specific Capacity Data

\[ R := 0.159 \]  \quad \text{Radius of Well (FT.)}

\[ S := 0.001 \]  \quad \text{Storage Coefficient, Assumed}

\[ t := \frac{30}{1440} \]  \quad \text{Pumping Duration (Days.)}

\[ T := 100 \]  \quad \text{Transmissivity (GPD/FT) Initial Guess}

\[ Q_p := 0.04 \]  \quad \text{Pumping Rate (GPM)}

\[ s := 2.8 \]  \quad \text{Drawdown (FT.)}

\[ \frac{Q_p}{s} = 0.014 \]  \quad \text{Specific Capacity (GPM/FT)}

\[ aT := \sqrt{\frac{Q_p}{s} - \frac{T}{264 \cdot \log \left( \frac{0.3 \cdot T \cdot t}{R^2 S} \right)}} \]

\[ T := aT \]

\[ T_{ft} := \frac{T}{7.48} \]

\[ T_{ft} = 2 \]  \quad \text{Computed Transmissivity (GPD/ Ft)}

\[ \text{Computed Transmissivity (Sq.ft./Day)} \]
Data Set: J:\...\MW-52 t16.aqt
Date: 04/19/07

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (12.5-22.2)
Test Date: 6/6/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test16)
Initial Displacement: 10.1 ft
Total Well Penetration Depth: 11.3 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 11.3 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.3991 ft/day
y0 = 10.78 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-52 (18.5-28.2)  
Test Date: 6/6/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-52 Test15)**

Initial Displacement: 11.39 ft  
Total Well Penetration Depth: 17.3 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 17.3 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.0006925 ft/day  
y0 = 11.34 ft
MW-52 TEST14

Data Set: J:\...\MW-52 t14.aqt
Date: 04/19/07
Time: 16:47:35

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (28.2-37.9)
Test Date: 6/6/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test14)

Initial Displacement: 18.77 ft
Total Well Penetration Depth: 27. ft
Casing Radius: 0.08333 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

Static Water Column Height: 27. ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.001021 ft/day
y0 = 18.77 ft
MW-52 TEST13

Data Set: J:\...\MW-52 t13.aqt
Date: 04/19/07  Time: 16:47:12

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (38.8-48.5)
Test Date: 6/5/06

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test13)
Initial Displacement: 20.33 ft  Static Water Column Height: 37.6 ft
Total Well Penetration Depth: 37.6 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.001321 ft/day  y0 = 20.23 ft
MW-52 TEST12

Data Set: J:\...\MW-52 t12.aqt
Date: 09/10/07
Time: 17:26:27

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (50-59.7)
Test Date: 6/5/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test12)

Initial Displacement: 23.34 ft
Total Well Penetration Depth: 59.7 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 59.7 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.0997 ft/day
y0 = 23.65 ft
MW-52 TEST11

Data Set: J:\...\MW-52 t11.aqt
Date: 04/19/07  Time: 16:45:56

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (60-69.7)
Test Date: 6/5/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test11)

Initial Displacement: 20.83 ft  Static Water Column Height: 69.7 ft
Total Well Penetration Depth: 69.7 ft  Screen Length: 10. ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.002132 ft/day  y0 = 20.69 ft
MW-52 TEST10

Data Set: J:\...\MW-52 t10.aqt
Date: 04/19/07 Time: 16:45:16

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (69-78.7)
Test Date: 6/2/06

AQUIFER DATA

Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test10)

Initial Displacement: 21.17 ft Static Water Column Height: 78.7 ft
Total Well Penetration Depth: 78.7 ft Screen Length: 10. ft
Casing Radius: 0.08333 ft Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.001839 ft/day y0 = 22.54 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-52 (76.4-86.1)  
Test Date: 6/2/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-52 Test9)**

Initial Displacement: 19.17 ft  
Static Water Column Height: 75.2 ft  
Total Well Penetration Depth: 75.2 ft  
Screen Length: 10. ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 0.02463 \text{ ft/day}$  
$y_0 = 17.81 \text{ ft}$
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-52 (89-98.7)
- **Test Date:** 6/1/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-52 Test8)**

- **Initial Displacement:** 20.29 ft
- **Static Water Column Height:** 87.8 ft
- **Total Well Penetration Depth:** 87.8 ft
- **Screen Length:** 10. ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.1546 ft/day
- **y0:** 20.45 ft
MW-52 TEST7

Data Set: J:\...\MW-52 t7.aqt
Date: 04/19/07 Time: 16:43:55

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (100.5-110.2)
Test Date: 6/1/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test7)

Initial Displacement: 20.47 ft
Total Well Penetration Depth: 99.3 ft
Casing Radius: 0.08333 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.164 ft/day
y0 = 20.61 ft
**Project Information**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-52 (115.3-125)
- **Test Date:** 6/1/06

**Aquifer Data**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**Well Data (MW-52 Test6)**

- **Initial Displacement:** 18.36 ft
- **Static Water Column Height:** 114.1 ft
- **Total Well Penetration Depth:** 114.1 ft
- **Screen Length:** 10. ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

**Solution**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.1322 ft/day
- **y0:** 18.78 ft
MW-52 TEST5

Data Set: J:\...\MW-52 t5.aqt
Date: 04/19/07 Time: 16:42:52

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (133.2-142.9)
Test Date: 5/31/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test5)

Initial Displacement: 18.36 ft
Total Well Penetration Depth: 132. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 132. ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.08353 ft/day
y0 = 17.74 ft
**MW-52 TEST4**

Data Set: J:\...\MW-52 t4.aqt  
Date: 04/26/07  Time: 23:16:40

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: **MW-52 (143.5-153.2)**  
Test Date: 5/31/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-52 Test4)**

Initial Displacement: 20.31 ft  
Total Well Penetration Depth: 142.3 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 142.3 ft  
Screen Length: 10. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.127 \text{ ft/day} \]  
\[ y_0 = 20.33 \text{ ft} \]
Data Set: J:\...\MW-52 t3.aqt
Date: 04/19/07
Time: 16:42:02

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (158.3-168)
Test Date: 5/31/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test3)

Initial Displacement: 17.9 ft
Static Water Column Height: 157.1 ft
Total Well Penetration Depth: 157.1 ft
Screen Length: 10. ft
Casing Radius: 0.08333 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.1443 ft/day
y0 = 17.93 ft
**AQUIFER DATA**

- Saturated Thickness: 300 ft
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-52 Test2)**

- Initial Displacement: 32.83 ft
- Static Water Column Height: 167.3 ft
- Total Well Penetration Depth: 167.3 ft
- Screen Length: 10 ft
- Casing Radius: 0.08333 ft
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined
- Solution Method: Hvorslev
- \[ K = 0.06415 \text{ ft/day} \]
- \[ y_0 = 33.24 \text{ ft} \]
MW-52 TEST1

Data Set: J:\...\MW-52 t1.aqt
Date: 04/19/07 Time: 16:40:57

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-52 (179.5-189.2)
Test Date: 5/30/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-52 Test 1)

Initial Displacement: 36.79 ft
Total Well Penetration Depth: 178.3 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 178.3 ft
Screen Length: 10. ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.0306 \text{ ft/day} \]
\[ y_0 = 36.38 \text{ ft} \]
MW-53-80 EXTRACTION TEST

Data Set: J:\...\MW-53-80 theis.aqt
Date: 09/12/07

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-53-80
Test Date: 12/19/06

WELL DATA

Pumping Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-53-80</td>
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<td>0</td>
</tr>
</tbody>
</table>

Observation Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-53-80</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[
T = 18.75 \text{ ft}^2/\text{day} \\
Kz/Kr = 1. \\
S = 0.003325 \\
b = 300. \text{ ft}
\]
**MW53-120 SLUG TEST 2**

Data Set: J:\...\MW53-120 2.aqt  
Date: 09/12/07  
Time: 14:13:55  

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW53-120  
Test Date: 12/28/06

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-53-120)**

- Initial Displacement: 29.55 ft  
- Total Well Penetration Depth: 62.2 ft  
- Casing Radius: 0.04167 ft  
- Static Water Column Height: 92.2 ft  
- Screen Length: 26. ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- $K = 0.1487$ ft/day  
- $y_0 = 20.18$ ft
### PROJECT INFORMATION

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-54 (187.0-206.0)
- **Test Date:** 10/2/06

### AQUIFER DATA

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-54 Test 17)

- **Initial Displacement:** 7.213 ft
- **Static Water Column Height:** 196.4 ft
- **Total Well Penetration Depth:** 196.4 ft
- **Screen Length:** 19. ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

### SOLUTION

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 1.478 ft/day
- **y0:** 7.77 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, NY  
Test Well: MW-54  
Test Date: 10/2/06

**WELL DATA**

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
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<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-54</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Theis  
\[
T = 23.75 \text{ ft}^2/\text{day}
\]
\[
S = 0.001002
\]
\[
\frac{K_z}{K_r} = 1
\]
\[
b = 300 \text{ ft}
\]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-54 (172.3-182.0)  
Test Date: 10/2/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-54 Test 15)**

Initial Displacement: 13.81 ft  
Total Well Penetration Depth: 172.4 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 172.4 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 2.501 \text{ ft/day}$  
$y_0 = 24.6 \text{ ft}$
MW-54 T15 PACKERED EXTRACTION

Data Set: J:...\MW-54 t15 theis.aqt
Date: 09/10/07
Time: 17:34:54

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-54
Test Date: 10/2/06

WELL DATA

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
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</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-54</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 30.35 ft²/day
S = 0.000205
Kz/Kr = 1.
b = 300. ft
MW-54 TEST 14

Data Set: J:\...\MW-54 T14.aqt
Date: 04/20/07 Time: 11:33:08

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (157.4-167.1)
Test Date: 10/2/06

AQUIFER DATA

Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54Test 14)

Initial Displacement: 17.41 ft
Total Well Penetration Depth: 157.6 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 157.6 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 1.058 ft/day
y0 = 17.74 ft
**MW-54 TEST 13**

Data Set: J:\...\MW-54 T13.aqt  
Date: 04/20/07  
Time: 11:32:46

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-54 (146.0-155.7)  
Test Date: 9/29/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-54Test 13)**

Initial Displacement: 17.69 ft  
Total Well Penetration Depth: 146.2 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 146.2 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 1.904 ft/day  
y0 = 18.76 ft
MW-54 T13 PACKERED EXTRACTION
Data Set: J:\...\MW-54 t13 theis.aqt
Date: 09/10/07  Time: 17:34:44

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-54
Test Date: 9/29/06

WELL DATA
Pumping Wells
Well Name  X (ft)  Y (ft)
MW-54  0  0

Observation Wells
Well Name  X (ft)  Y (ft)
MW-54  0  0

SOLUTION
Aquifer Model: Unconfined
Solution Method: Theis
T = 15.91 ft²/day
Kz/Kr = 1.
S = 0.001007
b = 300. ft
PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project:  41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (136.6-146.0)
Test Date: 9/29/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 12)

Initial Displacement: 15.94 ft
Total Well Penetration Depth: 136.4 ft
Casing Radius: 0.08333 ft
Screen Length: 9.4 ft
Static Water Column Height: 136.4 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
\( K = 2.798 \text{ ft/day} \)
\( y_0 = 17.61 \text{ ft} \)
MW-54 T12 PACKERED EXTRACTION

Data Set: J:...\MW-54 t12 theis.aqt
Date: 09/10/07
Time: 17:34:34

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-54
Test Date: 9/29/06

WELL DATA

Pumping Wells

<table>
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<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-54</td>
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<td>0</td>
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</tbody>
</table>

Observation Wells

<table>
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<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-54</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined

Solution Method: Theis

\[ T = \frac{Q}{4\pi} = 18.13 \text{ ft}^2/\text{day} \]

\[ S = 0.00206 \]

\[ K_z/K_r = 1. \]

\[ b = 300. \text{ ft} \]
MW-54 TEST 11

Data Set: J:\...\MW-54 T11.aqt
Date: 04/20/07
Time: 11:31:14

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (120.4-130.1)
Test Date: 9/29/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 11)

Initial Displacement: 15.26 ft
Total Well Penetration Depth: 120.6 ft
Casing Radius: 0.08333 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

Static Water Column Height: 120.6 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

$K = 2.456 \text{ ft/day}$
$y_0 = 16.52 \text{ ft}$
MW-54 T11 PACKERED EXTRACTION

Data Set: J:\...\MW-54 t11 theis.aqt
Date: 09/10/07
Time: 17:34:22

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-54
Test Date: 9/29/06

WELL DATA

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>MW-54</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

T = 13.03 ft²/day
S = 0.01141
Kz/Kr = 1
b = 300 ft
MW-54 TEST 10

Data Set: J:\...\MW-54 T10.aqt
Date: 04/20/07 Time: 11:29:58

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (110.7-120.4)
Test Date: 9/29/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 10)

Initial Displacement: 16.07 ft
Total Well Penetration Depth: 110.8 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 110.8 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.5963 ft/day
y0 = 17.71 ft
MW-54 TEST 9

Data Set: J:\...\MW-54 T9.aqt
Date: 04/20/07 Time: 11:29:28

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (101.0-110.7))
Test Date: 9/28/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 9)

Initial Displacement: 16.23 ft  Static Water Column Height: 101.2 ft
Total Well Penetration Depth: 101.2 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.4475 ft/day  y0 = 17.3 ft
MW-54 TEST 8

Data Set: J:\...\MW-54 T8.aqt
Date: 04/20/07  Time: 11:29:03

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (83.6-93.3)
Test Date: 9/28/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 8)

Initial Displacement: 16.13 ft  Static Water Column Height: 83.75 ft
Total Well Penetration Depth: 83.75 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.2985 ft/day  y0 = 15.97 ft
**PROJECT INFORMATION**

**Company:** GZA GeoEnvironmental  
**Client:** Indian Point Energy Center  
**Project:** 41.0017869.10  
**Location:** Buchanan, New York  
**Test Well:** MW-54 (73.9-83.6)  
**Test Date:** 9/28/06

**AQUIFER DATA**

- **Saturated Thickness:** 300 ft  
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-54 Test 7)**

- **Initial Displacement:** 12.49 ft  
- **Static Water Column Height:** 74.05 ft  
- **Total Well Penetration Depth:** 74.05 ft  
- **Screen Length:** 9.7 ft  
- **Casing Radius:** 0.08333 ft  
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined  
- **Solution Method:** Hvorslev  
- **K:** 0.1713 ft/day  
- **y0:** 12.31 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-54 (64.2-73.9)  
Test Date: 9/28/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-54 Test 6)**

Initial Displacement: 16.06 ft  
Total Well Penetration Depth: 64.35 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 64.35 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\( K = 0.278 \text{ ft/day} \)  
\( y_0 = 16.06 \text{ ft} \)
**MW-54 TEST5**

Data Set: J:\...\MW-54 T5.aqt
Date: 04/20/07
Time: 11:27:46

---

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (54.5-64.2)
Test Date: 9/28/06

---

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

---

**WELL DATA (MW-54 Test 5)**

Initial Displacement: 15.89 ft
Total Well Penetration Depth: 54.65 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 54.65 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

---

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.402 \text{ ft/day} \]
\[ y_0 = 16.73 \text{ ft} \]
**PROJECT INFORMATION**

**Company:** GZA GeoEnvironmental  
**Client:** Indian Point Energy Center  
**Project:** 41.0017869.10  
**Location:** Buchanan, New York  
**Test Well:** MW-54 (44.8-54.5)  
**Test Date:** 9/27/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-54 Test 4)**

Initial Displacement: 15.65 ft  
Static Water Column Height: 44.95 ft  
Total Well Penetration Depth: 44.95 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.6871 ft/day  
y0 = 16.67 ft
MW-54 TEST3
Data Set: J:\...\MW-54 T3.aqt
Date: 04/20/07 Time: 11:26:58

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (35.1-44.8)
Test Date: 9/28/06

AQUIFER DATA
Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 3)
Initial Displacement: 15.06 ft Static Water Column Height: 35.25 ft
Total Well Penetration Depth: 35.25 ft Screen Length: 9.7 ft
Casing Radius: 0.08333 ft Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.6897 ft/day y0 = 15.6 ft
MW-54 TEST2

Data Set: J:\\MW-54 T2.aqt
Date: 04/20/07 Time: 11:26:30

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (24.2-33.9)
Test Date: 9/26/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 2)

Initial Displacement: 16.57 ft
Total Well Penetration Depth: 24.35 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 24.35 ft
Screen Length: 9.8 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\( K = 0.4722 \text{ ft/day} \)
\( y_0 = 15.92 \) ft
MW-54 TEST1

Data Set: J:\\..\\MW-54 T1.aqt
Date: 04/20/07 Time: 11:25:57

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-54 (20.5-24)
Test Date: 9/26/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-54 Test 1)

Initial Displacement: 12.67 ft
Total Well Penetration Depth: 14.45 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 14.45 ft
Screen Length: 3.5 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.2222 ft/day
y0 = 12.93 ft
MW55-24 SLUG TEST 2

Data Set: J:\...\MW55-24-2.aqt  
Date: 09/12/07  
Time: 14:15:16

PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW55-24  
Test Date: 12/27/06

AQUIFER DATA

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-55-24)

Initial Displacement: 3.417 ft  
Static Water Column Height: 14.48 ft  
Total Well Penetration Depth: 14.48 ft  
Screen Length: 13. ft  
Casing Radius: 0.04167 ft  
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.6737 ft/day  
y0 = 3.376 ft
MW55-35 SLUG TEST

Data Set: J:\...\MW55-35.aqt
Date: 09/12/07  Time: 14:15:52

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW55-24
Test Date: 12/27/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-55-35)

Initial Displacement: 16.12 ft  Static Water Column Height: 25.12 ft
Total Well Penetration Depth: 25.12 ft  Screen Length: 8. ft
Casing Radius: 0.04167 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 2.51 ft/day  y0 = 19.03 ft
MW55-54 Slug Test

Data Set: J:\...\MW55-54.aqt
Date: 09/12/07
Time: 14:16:09

Project Information

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW55-54
Test Date: 12/27/06

Aquifer Data

Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 0.1

Well Data (MW-55-54)

Initial Displacement: 25.38 ft
Total Well Penetration Depth: 44.4 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 44.4 ft
Screen Length: 13 ft
Wellbore Radius: 0.159 ft

Solution

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 3.778 ft/day
y0 = 65.78 ft
### MW56-85 Slug Test

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<thead>
<tr>
<th>Data Set:</th>
<th>J:...\MW56-85.aqt</th>
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<td>Date:</td>
<td>09/12/07</td>
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<tr>
<td>Time:</td>
<td>14:18:18</td>
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</table>

### Project Information
- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW56-85
- **Test Date:** 12/28/06

### Aquifer Data
- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

### Well Data (MW-56-85)
- **Initial Displacement:** 3.486 ft
- **Static Water Column Height:** 39.2 ft
- **Total Well Penetration Depth:** 39.2 ft
- **Screen Length:** 19. ft
- **Casing Radius:** 0.04167 ft
- **Wellbore Radius:** 0.159 ft

### Solution
- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 3.854 ft/day
- **y0:** 2.73 ft
MW57-11 SLUG TEST

Data Set: J:\...\MW57-11.aqt
Date: 04/20/07  Time: 12:05:37

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW57-11
Test Date: 12/26/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-57-11)

Initial Displacement: 1.252 ft  Static Water Column Height: 6.6 ft
Total Well Penetration Depth: 6.6 ft  Screen Length: 9. ft
Casing Radius: 0.04167 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.3839 ft/day  y0 = 0.7981 ft
MW57-20 Slug Test

Data Set: J:\...\MW57-20.aqt
Date: 09/12/07
Time: 14:20:30

Project Information

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW57-20
Test Date: 12/26/06

Aquifer Data

Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 0.1

Well Data (MW-57-20)

Initial Displacement: 8.046 ft
Total Well Penetration Depth: 15.4 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 15.4 ft
Screen Length: 6 ft
Wellbore Radius: 0.159 ft

Solution

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 3.415 ft/day
y0 = 10.7 ft
MW57-45 SLUG TEST

Data Set: J:\...\MW57-45.aqt
Date: 09/12/07 Time: 14:20:20

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW57-45
Test Date: 12/26/06

AQUIFER DATA

Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-57-45)

Initial Displacement: 13. ft Static Water Column Height: 40.7 ft
Total Well Penetration Depth: 40.7 ft Screen Length: 18. ft
Casing Radius: 0.04167 ft Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.8935 ft/day y0 = 11.21 ft
**MW-58-25 EXTRACTION**

Data Set: J:\...\MW-58-25 theis.aqt
Date: 09/12/07  Time: 14:22:02

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-58-25
Test Date: 12/19/06

**WELL DATA**

<table>
<thead>
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<th>Pumping Wells</th>
<th>Observation Wells</th>
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<tbody>
<tr>
<td><strong>Well Name</strong></td>
<td><strong>X (ft)</strong></td>
</tr>
<tr>
<td>MW-58-25</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Theis

\[ T = 4.549 \text{ ft}^2/\text{day} \]
\[ S = 0.01966 \]
\[ K_z/K_r = 1. \]
\[ b = 300. \text{ ft} \]
MW58-65 SLUG TEST

Data Set: J:\...\MW58-65.redo.aqt
Date: 04/26/07  Time: 23:23:46

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW58-65
Test Date: 1/2/07

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-58-65)

Initial Displacement: 13.5 ft  Static Water Column Height: 59.6 ft
Total Well Penetration Depth: 59.6 ft  Screen Length: 19. ft
Casing Radius: 0.04167 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev

\[ K = 0.9583 \text{ ft/day} \]

\[ y_0 = 13.98 \text{ ft} \]
**MW59-31 SLUG TEST**

Data Set: J:\...\MW59-31.aqt
Date: 09/12/07 Time: 14:23:31

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW59-31
Test Date: 12/26/06

**AQUIFER DATA**

Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-59-31)**

Initial Displacement: 2.392 ft
Total Well Penetration Depth: 20.36 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 20.36 ft
Screen Length: 13. ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 5.936 \text{ ft/day} \]
\[ y_0 = 2.183 \text{ ft} \]
MW59-45 SLUG TEST
Data Set: J:\...\MW59-45.aqt
Date: 09/12/07 Time: 14:23:47

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW59-45
Test Date: 12/21/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-59-45)
Initial Displacement: 20.73 ft
Total Well Penetration Depth: 36.4 ft
Casing Radius: 0.04167 ft
Static Water Column Height: 36.4 ft
Screen Length: 8. ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 1.867 ft/day
y0 = 20.4 ft
**MW59-68 SLUG TEST**

Data Set: J:\...\MW59-68.aqt  
Date: 09/12/07  
Time: 14:24:00

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW59-45  
Test Date: 12/21/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-59-68)**

Initial Displacement: 37.1 ft  
Total Well Penetration Depth: 58. ft  
Casing Radius: 0.04167 ft  
Static Water Column Height: 58. ft  
Screen Length: 18. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\( K = 0.234 \text{ ft/day} \)  
\( y_0 = 38.51 \text{ ft} \)
**Project Information**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-60 (188.2-202.0)  
Test Date: 12/7/06

**Aquifer Data**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**Well Data (MW-60 Test 1)**

Initial Displacement: 24.8 ft  
Static Water Column Height: 190.7 ft  
Total Well Penetration Depth: 190.7 ft  
Screen Length: 13.8 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**Solution**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.04219 \text{ ft/day} \]  
\[ y_0 = 24.51 \text{ ft} \]
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-60 (172.3-182.0)
- **Test Date:** 12/7/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-60 Test 2)**

- **Initial Displacement:** 24.42 ft
- **Total Well Penetration Depth:** 170.1 ft
- **Casing Radius:** 0.08333 ft
- **Static Water Column Height:** 170.1 ft
- **Screen Length:** 9.7 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.01189 ft/day
- **y0:** 24.02 ft
Data Set: J:\...\MW-60 T3.aqt
Date: 04/26/07  Time: 23:17:45

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-60 (161.3-171)
Test Date: 12/11/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-60 Test 3)
Initial Displacement: 22.13 ft
Total Well Penetration Depth: 157.1 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 157.1 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.09717 ft/day
y0 = 22.01 ft
MW-60 TEST4

Data Set: J:\...\MW-60 T4.aqt
Date: 04/26/07 Time: 23:17:52

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-60 (151.3-161)
Test Date: 12/11/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-60 Test 4)

Initial Displacement: 17. ft
Total Well Penetration Depth: 147.5 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 147.5 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.5393 \text{ ft/day} \]
\[ y_0 = 9.673 \text{ ft} \]
### MW-60 TEST5

Data Set:  J:\...\MW-60 T5.aqt  
Date:  04/26/07  Time:  23:17:58

### PROJECT INFORMATION

Company:  GZA GeoEnvironmental  
Client:  Indian Point Energy Center  
Project:  41.0017869.10  
Location:  Buchanan, New York  
Test Well:  MW-60 (135-144.7)  
Test Date:  12/11/06

### AQUIFER DATA

Saturated Thickness:  300. ft  
Anisotropy Ratio (Kz/Kr):  0.1

### WELL DATA (MW-60 Test 5)

Initial Displacement:  12.67 ft  
Static Water Column Height:  131.9 ft  
Total Well Penetration Depth:  131.9 ft  
Screen Length:  9.7 ft  
Casing Radius:  0.08333 ft  
Wellbore Radius:  0.159 ft

### SOLUTION

Aquifer Model:  Unconfined  
Solution Method:  Hvorslev  
\[ K = 0.2935 \text{ ft/day} \]  
\[ y_0 = 12.49 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-60 (115.3-125)  
Test Date: 12/12/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-60 Test 6)**

Initial Displacement: 22.45 ft  
Static Water Column Height: 111.8 ft  
Total Well Penetration Depth: 111.8 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.02196 ft/day  
y0 = 22.17 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-60 (99.3-109)  
Test Date: 12/12/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-60 Test 7)**

Initial Displacement: 19.41 ft  
Static Water Column Height: 95.35 ft  
Total Well Penetration Depth: 170.1 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 0.1187 \text{ ft/day}$  
$y_0 = 19.41 \text{ ft}$
**MW-60 TEST8**

Data Set: J:\...\MW-60 T8.aqt
Date: 04/23/07 Time: 16:20:12

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-60 (88.3-98)
Test Date: 12/12/06

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-60 Test 8)**

Initial Displacement: 21.61 ft
Total Well Penetration Depth: 84. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 84. ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.2683 \text{ ft/day} \]
\[ y_0 = 21.53 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-60 (69-78.7)  
Test Date: 12/13/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-60 Test 9)**

Initial Displacement: 19.22 ft  
Total Well Penetration Depth: 66.45 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 66.45 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.398 ft/day  
y0 = 19.22 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-60 (50.3-60)  
Test Date: 12/13/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-60 Test10)**

Initial Displacement: 14.24 ft  
Static Water Column Height: 46.87 ft  
Total Well Penetration Depth: 46.87 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.8329 \text{ ft/day} \]  
\[ y_0 = 13.87 \text{ ft} \]
### PROJECT INFORMATION

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-60 (34.3-44)
- **Test Date:** 12/13/06

### AQUIFER DATA

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-60 Test11)

- **Initial Displacement:** 22.6 ft
- **Total Well Penetration Depth:** 30.49 ft
- **Casing Radius:** 0.08333 ft
- **Static Water Column Height:** 30.49 ft
- **Screen Length:** 9.7 ft
- **Wellbore Radius:** 0.159 ft

### SOLUTION

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- \( K = 0.06467 \text{ ft/day} \)
- \( y_0 = 22.47 \text{ ft} \)
PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-60 (10.2-29)
Test Date: 12/13/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-60 Test12)

Initial Displacement: 8.709 ft
Total Well Penetration Depth: 15.43 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 15.43 ft
Screen Length: 18.8 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.0006557 ft/day
y0 = 8.669 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/19/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test 1)**

Initial Displacement: 22.93 ft  
Total Well Penetration Depth: 189. ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 189. ft  
Screen Length: 13.9 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 0.373 \text{ ft/day}$  
y0 = 23.02 ft
**MW-62 TEST2**

Data Set: J:\...\MW-62T2.aqt
Date: 04/23/07  Time: 16:30:16

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-62
Test Date: 12/20/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test 2)**

Initial Displacement: 24.27 ft  Static Water Column Height: 173.3 ft
Total Well Penetration Depth: 173.3 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  Solution Method: Hvorslev

\[ K = 0.7246 \text{ ft/day} \]

\[ y_0 = 25 \text{ ft} \]
**MW-62 TEST3**

Data Set: J:\...\MW-62T3.aqt  
Date: 04/23/07  
Time: 16:30:47

---

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/20/06

---

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

---

**WELL DATA (MW-62 Test 3)**

Initial Displacement: 19.48 ft  
Total Well Penetration Depth: 165.2 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 165.2 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

---

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.344 \text{ ft/day} \]  
\[ y_0 = 19.64 \text{ ft} \]
MW-62 TEST4

Data Set: J:\...\MW-62T4.aqt
Date: 04/23/07    Time: 16:31:05

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-62
Test Date: 12/20/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-62 Test4)

Initial Displacement: 19.65 ft
Total Well Penetration Depth: 154.7 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 154.7 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.04219 ft/day
y0 = 19.52 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/20/06

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test5)**

- Initial Displacement: 18.06 ft  
- Total Well Penetration Depth: 144.1 ft  
- Casing Radius: 0.08333 ft  
- Static Water Column Height: 144.1 ft  
- Screen Length: 9.7 ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- \( K = 0.09074 \text{ ft/day} \)  
- \( y_0 = 17.93 \text{ ft} \)
MW-62 TEST6

Data Set: J:\...\MW-62T6.aqt
Date: 04/23/07 Time: 16:31:44

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-62
Test Date: 12/21/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-62 Test6)

Initial Displacement: 20.13 ft
Total Well Penetration Depth: 130.8 ft
Casing Radius: 0.08333 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

Static Water Column Height: 130.8 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = \frac{20.6}{0.2406} \text{ ft/day} \]

\[ y_0 = 20.6 \text{ ft} \]
**MW-62 TEST7**

Data Set: J:\...\MW-62Test7.aqt  
Date: 01/03/08  
Time: 12:37:18

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/21/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test7)**

Initial Displacement: 21.12 ft  
Total Well Penetration Depth: 112.7 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 112.7 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.2238 \text{ ft/day} \]  
\[ y_0 = 21.8 \text{ ft} \]
**MW-62 TEST8**

Data Set: J:\...\MW-62T8.aqt  
Date: 04/23/07  
Time: 16:32:25

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/21/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test8)**

Initial Displacement: 21.2 ft  
Total Well Penetration Depth: 103. ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 103. ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.07574 \text{ ft/day} \]  
\[ y_0 = 21.09 \text{ ft} \]
MW-62 TEST9

Data Set: \J\...\MW-62T9.aqt
Date: 04/23/07  Time: 16:32:41

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-62
Test Date: 12/21/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-62 Test9)

Initial Displacement: 22.57 ft  Static Water Column Height: 93.56 ft
Total Well Penetration Depth: 93.56 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.06006 ft/day  y0 = 22.57 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62  
Test Date: 12/21/06

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62 Test10)**

- Initial Displacement: 21.24 ft  
- Total Well Penetration Depth: 76.9 ft  
- Casing Radius: 0.08333 ft  
- Static Water Column Height: 76.9 ft  
- Screen Length: 9.7 ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev

- \( K = 0.05019 \text{ ft/day} \)  
- \( y_0 = 21.4 \text{ ft} \)
AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-62 Test11)

Initial Displacement: 21.3 ft
Total Well Penetration Depth: 57.98 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 57.98 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.008284 \text{ ft/day} \]
\[ y_0 = 21.41 \text{ ft} \]
MW-62 TEST12

Data Set: J:\...\MW-62T12.aqt
Date: 04/23/07
Time: 16:33:44

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-62
Test Date: 12/22/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-62 Test12)

Initial Displacement: 21.84 ft
Total Well Penetration Depth: 190.7 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 45.92 ft
Screen Length: 13.8 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.007207 \text{ ft/day} \]
\[ y_0 = 21.73 \text{ ft} \]
**MW-62-38 PNEUMATIC SLUG (TEST 2)**

Data Set: J:\...\MW-62-38 May07 T2.aqt
Date: 07/01/07  Time: 18:10:58

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-62-38  
Test Date: 5/16/07

**AQUIFER DATA**

- Saturated Thickness: 300. ft  
- Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-62-38)**

- Initial Displacement: 7.38 ft  
- Static Water Column Height: 24.79 ft  
- Total Well Penetration Depth: 24.79 ft  
- Screen Length: 6.3 ft  
- Casing Radius: 0.04167 ft  
- Wellbore Radius: 0.159 ft

**SOLUTION**

- Aquifer Model: Unconfined  
- Solution Method: Hvorslev  
- \( K = 11.77 \text{ ft/day} \)  
- \( y_0 = 6.523 \text{ ft} \)
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63 (186.0-201.0)  
Test Date: 11/9/06  

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1  

**WELL DATA (MW-63 Test13)**

Initial Displacement: 18.76 ft  
Static Water Column Height: 188.5 ft  
Total Well Penetration Depth: 188.5 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft  

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 1.43 \text{ ft/day} \]

\[ y_0 = 21.07 \text{ ft} \]
MW-63 TEST12

Data Set: J:\...\MW-63 T12.aqt
Date: 04/23/07  Time: 16:44:37

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-63 (165.0-174.7)
Test Date: 11/10/06

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63 Test12)
Initial Displacement: 19.08 ft  Static Water Column Height: 162.2 ft
Total Well Penetration Depth: 162.2 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.3945 ft/day  y0 = 19.02 ft
**MW-63 TEST11**

Data Set: J:\...\MW-63 T11.aqt  
Date: 04/26/07  
Time: 23:20:45

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63 (155.0-164.7)  
Test Date: 11/10/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-63 Test11)**

Initial Displacement: 22.03 ft  
Total Well Penetration Depth: 152.2 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 152.2 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\( K = 0.4578 \text{ ft/day} \)  
\( y_0 = 22.99 \text{ ft} \)
Data Set: J:\...\MW-63 T10.aqt
Date: 04/23/07
Time: 16:43:54

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-63 (145.0-154.7)
Test Date: 11/10/06

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63 Test10)
Initial Displacement: 18.81 ft
Total Well Penetration Depth: 141.1 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 141.1 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.04377 ft/day
y0 = 18.75 ft
MW-63 TEST9

Data Set: J:\...\MW-63 T9.aqt
Date: 04/26/07 Time: 23:20:30

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-63 (123.5-133.2)
Test Date: 11/10/06

AQUIFER DATA

Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63 Test 9)

Initial Displacement: 16.57 ft Static Water Column Height: 120.7 ft
Total Well Penetration Depth: 120.7 ft Screen Length: 9.7 ft
Casing Radius: 0.08333 ft Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.2997 ft/day y0 = 17.53 ft
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-63 (110.0-119.7)
- **Test Date:** 11/10/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-63 Test 8)**

- **Initial Displacement:** 18.24 ft
- **Static Water Column Height:** 107.2 ft
- **Total Well Penetration Depth:** 107.2 ft
- **Screen Length:** 9.7 ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **$K = 1.049$ ft/day**
- **$y_0 = 18.44$ ft**
### MW-63 TEST7

**Data Set:** J:\...\MW-63 T7.aqt  
**Date:** 04/26/07  
**Time:** 23:20:12

### PROJECT INFORMATION

- **Company:** GZA GeoEnvironmental  
- **Client:** Indian Point Energy Center  
- **Project:** 41.0017869.10  
- **Location:** Buchanan, New York  
- **Test Well:** MW-63 (100.0-109.7)  
- **Test Date:** 11/13/06

### AQUIFER DATA

- **Saturated Thickness:** 300. ft  
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-63 Test 7)

- **Initial Displacement:** 23.89 ft  
- **Static Water Column Height:** 97.2 ft  
- **Total Well Penetration Depth:** 97.2 ft  
- **Screen Length:** 9.7 ft  
- **Casing Radius:** 0.08333 ft  
- **Wellbore Radius:** 0.159 ft

### SOLUTION

- **Aquifer Model:** Unconfined  
- **Solution Method:** Hvorslev  
- **K:** 0.09426 ft/day  
- **y0:** 24.01 ft
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-63 (88.3-98.0)
- **Test Date:** 11/13/06

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-63 Test 6)**

- **Initial Displacement:** 24.93 ft
- **Static Water Column Height:** 85.5 ft
- **Total Well Penetration Depth:** 85.5 ft
- **Screen Length:** 9.7 ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** $1.101$ ft/day
- **y0:** 26.7 ft
MW-63 TEST5

Data Set: J:\...\MW-63 T5.aqt
Date: 04/23/07  Time: 16:42:18

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-63 (78.6-88.3)
Test Date: 11/13/06

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63 Test 5)

Initial Displacement: 15.84 ft  Static Water Column Height: 75.8 ft
Total Well Penetration Depth: 75.8 ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 1.852 ft/day  y0 = 16.54 ft
MW-63 TEST4
Data Set: J:\...\MW-63 T4.aqt
Date: 04/23/07 Time: 16:41:59

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-63 (71.0-80.7)
Test Date: 11/13/06

AQUIFER DATA
Saturated Thickness: 300. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-63 Test 4)
Initial Displacement: 22.17 ft Static Water Column Height: 68.2 ft
Total Well Penetration Depth: 68.2 ft Screen Length: 9.7 ft
Casing Radius: 0.08333 ft Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined Solution Method: Hvorslev
K = 0.434 ft/day y0 = 23.58 ft
**MW-63 TEST3**

Data Set: J:\...\MW-63 T3.aqt  
Date: 04/23/07  
Time: 16:41:14

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63 (60.8-70.5)  
Test Date: 11/14/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-63 Test3)**

Initial Displacement: 24.62 ft  
Total Well Penetration Depth: 58. ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 58. ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.2877 \text{ ft/day} \]  
\[ y_0 = 24.56 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63 (50.5-60.2)  
Test Date: 10/17/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-63 Test 2)**

Initial Displacement: 8.89 ft  
Static Water Column Height: 47.7 ft  
Total Well Penetration Depth: 47.7 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.8719 \text{ ft/day} \]  
\[ y_0 = 8.987 \text{ ft} \]
MW-63 T1 PACKERED EXTRACTION

Data Set: J:\...\MW-63 T1 theis.aqt
Date: 09/10/07  Time: 17:48:55

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-63
Test Date: 10/12/06

WELL DATA

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-63</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation Wells</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Observation Wells</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-63</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 96.47 \text{ ft}^2/\text{day} \]
\[ S = 0.0099 \]
\[ \frac{K_z}{K_r} = 1 \]
\[ b = 300. \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63 (12.5-50.5)  
Test Date: 10/12/06

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-63 Test 1)**

Initial Displacement: 4.164 ft  
Total Well Penetration Depth: 50.5 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 50.5 ft  
Screen Length: 14. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.8076 \text{ ft/day} \]  
\[ y_0 = 4.312 \text{ ft} \]
**MW-63-35 MAY07 PNEUMATIC SLUG (TEST1)**

Data Set: J:\...\MW-63-35 May07 T1.aqt  
Date: 07/01/07  Time: 18:13:59

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-63-35  
Test Date: 5/9/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-63-35)**

Initial Displacement: 1.637 ft  
Total Well Penetration Depth: 21.57 ft  
Casing Radius: 0.04167 ft  
Static Water Column Height: 21.57 ft  
Screen Length: 7. ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev

$K = 48.36 \text{ ft/day}$  
$y_0 = 1.69 \text{ ft}$
MW-65-48 EXTRACTION TEST

Data Set: J:\...\MW-65-48theis.aqt
Date: 09/12/07  Time: 14:26:12

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-65-48
Test Date: 12/29/06

WELL DATA

Pumping Wells

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<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
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</thead>
<tbody>
<tr>
<td>MW-65-48</td>
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<td>0</td>
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Observation Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
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</thead>
<tbody>
<tr>
<td>MW-65-48</td>
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<td>0</td>
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</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 3.895 \text{ ft}^2/\text{day} \]
\[ S = 0.05296 \]
\[ K_z/K_r = 1 \]
\[ b = 300 \text{ ft} \]
**MW65-80 SLUG TEST**

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<thead>
<tr>
<th>Data Set:</th>
<th>J:...\MW65-80.aqt</th>
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<tbody>
<tr>
<td>Date:</td>
<td>09/12/07</td>
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<tr>
<td>Time:</td>
<td>14:26:47</td>
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**PROJECT INFORMATION**

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<tr>
<th>Company:</th>
<th>GZA GeoEnvironmental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client:</td>
<td>Indian Point Energy Center</td>
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<tr>
<td>Project:</td>
<td>41.0017869.10</td>
</tr>
<tr>
<td>Location:</td>
<td>Buchanan, New York</td>
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<tr>
<td>Test Well:</td>
<td>MW65-80</td>
</tr>
<tr>
<td>Test Date:</td>
<td>12/28/06</td>
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</tbody>
</table>

**AQUIFER DATA**

<table>
<thead>
<tr>
<th>Saturated Thickness:</th>
<th>300. ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anisotropy Ratio (Kz/Kr):</td>
<td>0.1</td>
</tr>
</tbody>
</table>

**WELL DATA (MW-65-80)**

<table>
<thead>
<tr>
<th>Initial Displacement:</th>
<th>19.42 ft</th>
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<tbody>
<tr>
<td>Total Well Penetration Depth:</td>
<td>46.9 ft</td>
</tr>
<tr>
<td>Casing Radius:</td>
<td>0.04167 ft</td>
</tr>
<tr>
<td>Screen Length:</td>
<td>24.5 ft</td>
</tr>
<tr>
<td>Wellbore Radius:</td>
<td>0.159 ft</td>
</tr>
</tbody>
</table>

**SOLUTION**

<table>
<thead>
<tr>
<th>Aquifer Model:</th>
<th>Unconfined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution Method:</td>
<td>Hvorslev</td>
</tr>
<tr>
<td>K = 0.3931 ft/day</td>
<td>y0 = 15.88 ft</td>
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</tbody>
</table>
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-66  
Test Date: 1/4/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-66 Test 1)**

Initial Displacement: 32.65 ft  
Static Water Column Height: 188.1 ft  
Total Well Penetration Depth: 188.1 ft  
Screen Length: 18. ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.4248 ft/day  
y0 = 33.28 ft

---

**Graph:**

- **Normalized Head (ft/ft):** y-axis from 0.001 to 1.0
- **Time (min):** x-axis from 0.0 to 20.0
- Data points and a trend line indicating the relationship between time and normalized head.
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-66
- **Test Date:** 1/4/07

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-66 Test 2)**

- **Initial Displacement:** 24.73 ft
- **Total Well Penetration Depth:** 169.5 ft
- **Casing Radius:** 0.08333 ft
- **Static Water Column Height:** 169.5 ft
- **Screen Length:** 9.7 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K = 0.2108 ft/day**
- **y0 = 24.57 ft**
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-66
- **Test Date:** 1/4/07

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-66 Test 3)**

- **Initial Displacement:** 24.57 ft
- **Total Well Penetration Depth:** 159. ft
- **Casing Radius:** 0.08333 ft
- **Screen Length:** 9.7 ft
- **Wellbore Radius:** 0.159 ft
- **Static Water Column Height:** 159. ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.1738 ft/day
- **y0:** 25.04 ft
MW-66 (TEST4)

Data Set: J:\...\MW-66 T4.aqt
Date: 04/24/07 Time: 08:50:48

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-66
Test Date: 1/5/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-66 Test 4)
Initial Displacement: 21.25 ft
Total Well Penetration Depth: 148.9 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 148.9 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.1426 \text{ ft/day} \]
\[ y_0 = 21.73 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-66
Test Date: 1/5/07

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-66 Test 5)**

Initial Displacement: 21.23 ft
Total Well Penetration Depth: 139.6 ft
Casing Radius: 0.08333 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev
\[ K = 0.06558 \text{ ft/day} \]
\[ y_0 = 21.01 \text{ ft} \]
PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-66
Test Date: 1/5/07

WELL DATA

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-66</td>
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<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-66</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 14.03 \text{ ft}^2/\text{day} \]
\[ \frac{K_z}{K_r} = 1. \]
\[ S = 0.01463 \]
\[ b = 300. \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-66  
Test Date: 1/5/07  

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1  

**WELL DATA (MW-66 Test7)**

Initial Displacement: 16.9 ft  
Total Well Penetration Depth: 107.4 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 107.4 ft  
Screen Length: 9.7 ft  
Wellbore Radius: 0.159 ft  

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 1.467 ft/day  
y0 = 17.97 ft
MW-66 (TEST8)

Data Set: J:\...\MW-66 T8.aqt
Date: 04/24/07 Time: 08:53:27

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-66
Test Date: 1/5/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-66 Test8)

Initial Displacement: 20.19 ft
Total Well Penetration Depth: 95.4 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 95.4 ft
Screen Length: 9.7 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

\( K = 0.04596 \text{ ft/day} \)
\( y_0 = 20.37 \text{ ft} \)
MW-66 (TEST9)

Data Set: J:\...\MW-66 T9.aqt
Date: 04/26/07  Time: 23:25:30

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-66
Test Date: 1/8/07

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-66 Test9)

Initial Displacement: 23.52 ft  Static Water Column Height: 81. ft
Total Well Penetration Depth: 81. ft  Screen Length: 9.7 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.183 ft/day  y0 = 24.15 ft
MW-66 (TEST10)

Data Set: J:\...\MW-66 T10.aqt
Date: 04/26/07 Time: 23:25:37

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-66
Test Date: 1/8/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-66 Test10)

Initial Displacement: 21.26 ft
Static Water Column Height: 60.4 ft
Total Well Penetration Depth: 60.4 ft
Screen Length: 9.7 ft
Casing Radius: 0.08333 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.04106 ft/day
y0 = 21.26 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-66  
Test Date: 1/8/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-66 Test11)**

Initial Displacement: 21.71 ft  
Static Water Column Height: 40.6 ft  
Total Well Penetration Depth: 40.6 ft  
Screen Length: 9.7 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.09119 \text{ ft/day} \]  
\[ y_0 = 21.35 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, NY  
Test Well: MW-66  
Test Date: 1/8/07

**WELL DATA**

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
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<td>MW-66</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-66</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Theis  

\[
T = 62.98 \text{ ft}^2/\text{day} 
\]

\[
S = 0.01067 
\]

\[
b = 300. \text{ ft} 
\]
PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/7/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 1)

Initial Displacement: 9.8 ft
Total Well Penetration Depth: 336.6 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 336.6 ft
Screen Length: 18.65 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 1.323 ft/day
y0 = 8.407 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/7/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test 1)**

Initial Displacement: 9.48 ft  
Total Well Penetration Depth: 336.6 ft  
Static Water Column Height: 336.6 ft  
Screen Length: 18.65 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 1.071 ft/day  
y0 = 8.682 ft
Data Set: J:...\MW-67 T2B.aqt
Date: 08/22/07  Time: 10:56:49

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/9/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 2)
Initial Displacement: 7.75 ft
Total Well Penetration Depth: 325.1 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 325.1 ft
Screen Length: 30.15 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.9602 ft/day
y0 = 7.183 ft
AQUIFER DATA

- Saturated Thickness: 300. ft
- Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 2)

- Initial Displacement: 8.324 ft
- Total Well Penetration Depth: 325.1 ft
- Casing Radius: 0.08333 ft

- Static Water Column Height: 325.1 ft
- Screen Length: 30.15 ft
- Wellbore Radius: 0.159 ft

SOLUTION

- Aquifer Model: Unconfined
- Solution Method: Hvorslev
- \( K = 0.7659 \text{ ft/day} \)
- \( y_0 = 7.151 \text{ ft} \)
Data Set: J:\...\MW-67 T3.aqt
Date: 08/22/07
Time: 10:57:48

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/9/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 3)

Initial Displacement: 16.09 ft
Total Well Penetration Depth: 336.6 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 316.8 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.7394 ft/day
y0 = 14.87 ft
MW-67 (TEST3 EXTRACTION RECOVERY)

Data Set: J:\\MW-67 T3 (R2).aqt
Date: 08/22/07          Time: 10:58:20

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/9/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 3)

Initial Displacement: 21.94 ft
Total Well Penetration Depth: 316.8 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 316.8 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined

Solution Method: Hvorslev

\[ K = 0.6637 \text{ ft/day} \]
\[ y_0 = 19.75 \text{ ft} \]
MW-67 (TEST4 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T4.aqt
Date: 08/22/07
Time: 10:58:38

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/10/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 4)

Initial Displacement: 54.08 ft
Total Well Penetration Depth: 311. ft
Casing Radius: 0.08333 ft

Static Water Column Height: 311. ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

$K = 0.2468 \text{ ft/day}$
$y_0 = 51.32 \text{ ft}$
MW-67 (TEST5 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T5.aqt
Date: 08/22/07  Time: 10:59:12

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/10/07

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 5)

Initial Displacement: 13.39 ft  Static Water Column Height: 298.6 ft
Total Well Penetration Depth: 298.6 ft  Screen Length: 14.75 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.874 ft/day  y0 = 11.9 ft
PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.001786 9.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/14/07

AQUIFER DATA

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 6)

Initial Displacement: 22.35 ft  
Static Water Column Height: 287.4 ft  
Total Well Penetration Depth: 287.4 ft  
Screen Length: 14.75 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  
Solution Method: Hvorslev

\[ K = 0.4572 \text{ ft/day} \]  
\[ y_0 = 21.5 \text{ ft} \]
MW-67 (TEST6 EXTRACTION RECOVERY)

Data Set: \J:\...\MW-67 T6 (R2).aqt
Date: 08/22/07 Time: 11:00:05

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/14/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 6)
Initial Displacement: 27.59 ft
Total Well Penetration Depth: 287.4 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 287.4 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.4099 ft/day
y0 = 25.41 ft
### MW-67 (TEST8 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T8.aqt
Date: 08/22/07  
Time: 11:00:49

### PROJECT INFORMATION

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/15/07

### AQUIFER DATA

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<th>Anisotropy Ratio (Kz/Kr)</th>
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<tr>
<td>300. ft</td>
<td>0.1</td>
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</table>

### WELL DATA (MW-67 Test 8)

<table>
<thead>
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<th>Initial Displacement</th>
<th>Static Water Column Height</th>
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<tr>
<td>4.769 ft</td>
<td>260.8 ft</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Well Penetration Depth</th>
<th>Screen Length</th>
<th>Casing Radius</th>
<th>Wellbore Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>260.8 ft</td>
<td>14.75 ft</td>
<td>0.08333 ft</td>
<td>0.159 ft</td>
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</tbody>
</table>

### SOLUTION

<table>
<thead>
<tr>
<th>Aquifer Model</th>
<th>Solution Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unconfined</td>
<td>Hvorslev</td>
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</table>

<table>
<thead>
<tr>
<th>K</th>
<th>y0</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.35 ft/day</td>
<td>4.111 ft</td>
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</table>
MW-67 (TEST9 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T9.aqt
Date: 08/22/07  Time: 11:01:27

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/16/07

AQUIFER DATA

Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test 9)

Initial Displacement: 8.174 ft  Static Water Column Height: 250.8 ft
Total Well Penetration Depth: 250.8 ft  Screen Length: 14.75 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined  Solution Method: Hvorslev
$K = 2.106 \text{ ft/day}$  $y0 = 7.85 \text{ ft}$
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/16/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test10)**

Initial Displacement: 32. ft  
Static Water Column Height: 236. ft  
Total Well Penetration Depth: 236. ft  
Screen Length: 14.75 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.4478 \text{ ft/day} \]  
\[ y_0 = 31.61 \text{ ft} \]
MW-67 (TEST10 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T10 (R2).aqt
Date: 08/22/07 Time: 11:02:10

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/16/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test10)

Initial Displacement: 14.87 ft
Total Well Penetration Depth: 236. ft
Casing Radius: 0.08333 ft
Static Water Column Height: 236. ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.4509 ft/day
y0 = 13. ft
**MW-67 (TEST11)**

Data Set: J:\...\MW-67 T11.aqt
Date: 08/23/07  Time: 12:17:17

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/17/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test11)**

Initial Displacement: 19.5 ft  
Total Well Penetration Depth: 218.1 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 218.1 ft  
Screen Length: 14.75 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  

\[ K = 0.9122 \text{ ft/day} \]  
\[ y_0 = 20.07 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/17/07

---

**AQUIFER DATA**

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

---

**WELL DATA (MW-67 Test11)**

Initial Displacement: 10.3 ft
Total Well Penetration Depth: 218.1 ft
Casing Radius: 0.08333 ft

Static Water Column Height: 218.1 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

---

**SOLUTION**

Aquifer Model: Unconfined
Solution Method: Hvorslev

\[ K = 0.9827 \text{ ft/day} \]

\[ y_0 = 9.528 \text{ ft} \]
MW-67 (TEST12)

Data Set: J:\...\MW-67 T12.aqt
Date: 08/23/07  Time: 12:18:39

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/20/07

AQUIFER DATA
Saturated Thickness: 300. ft  Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test12)
Initial Displacement: 16.4 ft  Static Water Column Height: 202.4 ft
Total Well Penetration Depth: 202.4 ft  Screen Length: 14.75 ft
Casing Radius: 0.08333 ft  Wellbore Radius: 0.159 ft

SOLUTION
Aquifer Model: Unconfined  Solution Method: Hvorslev
K = 0.2924 ft/day  y0 = 16. ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/20/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test12)**

Initial Displacement: 22.3 ft  
Total Well Penetration Depth: 202.4 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 202.4 ft  
Screen Length: 14.75 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\( K = 0.2894 \text{ ft/day} \)  
\( y_0 = 21.64 \text{ ft} \)
MW-67 (TEST13 EXTRACTION RECOVERY)

Date: 08/23/07  Time: 12:19:15

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/20/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test13)

Initial Displacement: 50. ft
Total Well Penetration Depth: 171.3 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 171.3 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.1459 ft/day
y0 = 48.39 ft
### PROJECT INFORMATION

Company: **GZA GeoEnvironmental**  
Client: **Indian Point Energy Center**  
Project: 41.0017869.10  
Location: **Buchanan, New York**  
Test Well: **MW-67**  
Test Date: **8/20/07**

### AQUIFER DATA

- **Saturated Thickness:** 300. ft  
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-67 Test14)

- **Initial Displacement:** 20.17 ft  
- **Total Well Penetration Depth:** 155.2 ft  
- **Screen Length:** 14.75 ft  
- **Casing Radius:** 0.08333 ft  
- **Wellbore Radius:** 0.159 ft  
- **Static Water Column Height:** 155.2 ft

### SOLUTION

- **Aquifer Model:** **Unconfined**  
- **Solution Method:** **Hvorslev**  
- **\( K = 0.1375 \text{ ft/day} \)**  
- **\( y_0 = 19.98 \text{ ft} \)**
MW-67 (TEST14 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T14 (R2).aqt
Date: 08/23/07 Time: 12:19:35

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/20/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test14)

Initial Displacement: 29.1 ft
Total Well Penetration Depth: 155.2 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 155.2 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
\( K = 0.1184 \text{ ft/day} \)
\( y_0 = 29.2 \text{ ft} \)
**MW-67 (TEST15)**

Data Set: J:\...\MW-67 T15.aqt
Date: 08/23/07 Time: 12:19:46

**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/20/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test15)**

Initial Displacement: 54.38 ft  
Static Water Column Height: 135.1 ft  
Total Well Penetration Depth: 135.1 ft  
Screen Length: 14.75 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.1582 \text{ ft/day} \]  
\[ y_0 = 52.25 \text{ ft} \]
### PROJECT INFORMATION

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-67
- **Test Date:** 8/20/07

### AQUIFER DATA

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

### WELL DATA (MW-67 Test15)

- **Initial Displacement:** 35.83 ft
- **Static Water Column Height:** 135.1 ft
- **Total Well Penetration Depth:** 135.1 ft
- **Casing Radius:** 0.08333 ft
- **Screen Length:** 14.75 ft
- **Wellbore Radius:** 0.159 ft

### SOLUTION

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 0.5267 ft/day
- **y0:** 37.26 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/21/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test16)**

Initial Displacement: 24.19 ft  
Static Water Column Height: 129.5 ft  
Total Well Penetration Depth: 129.5 ft  
Screen Length: 14.75 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 0.2159 \text{ ft/day}$  
$y_0 = 22.89 \text{ ft}$
MW-67 (TEST16 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T16.aqt
Date: 08/24/07 Time: 17:06:06

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/24/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test16)

Initial Displacement: 17.1 ft
Total Well Penetration Depth: 129.5 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 129.5 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

$K = 0.3351 \text{ ft/day}$
$y_0 = 18.33 \text{ ft}$
MW-67 (TEST17 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T17.aqt
Date: 01/03/08
Time: 12:44:37

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/24/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test17)

Initial Displacement: 17.77 ft
Total Well Penetration Depth: 118.5 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 118.5 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.204 ft/day
y0 = 16.01 ft
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/21/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test18)**

Initial Displacement: 21.36 ft  
Total Well Penetration Depth: 102. ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 102. ft  
Screen Length: 14.75 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
K = 0.8239 ft/day  
y0 = 20.09 ft
**PROJECT INFORMATION**

**Company:** GZA GeoEnvironmental

**Client:** Indian Point Energy Center

**Project:** 41.0017869.10

**Location:** Buchanan, New York

**Test Well:** MW-67

**Test Date:** 8/21/07

---

**AQUIFER DATA**

**Saturated Thickness:** 300. ft

**Anisotropy Ratio (Kz/Kr):** 0.1

---

**WELL DATA (MW-67 Test18)**

**Initial Displacement:** 10.82 ft

**Static Water Column Height:** 102. ft

**Total Well Penetration Depth:** 102. ft

**Screen Length:** 14.75 ft

**Casing Radius:** 0.08333 ft

**Wellbore Radius:** 0.159 ft

---

**SOLUTION**

**Aquifer Model:** Unconfined

**Solution Method:** Hvorslev

**K:** 0.9609 ft/day

**y0:** 10.57 ft

---

**Data Set:** J:\MW-67 T18(R2).aqt

**Date:** 08/23/07

**Time:** 12:21:33
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/21/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test19)**

Initial Displacement: 22.35 ft  
Total Well Penetration Depth: 86.8 ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 86.8 ft  
Screen Length: 14.75 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.269 \text{ ft/day} \]  
\[ y_0 = 19.79 \text{ ft} \]
MW-67 (TEST19 EXTRACTION RECOVERY)

Data Set: J:\...\MW-67 T19(R2).aqt
Date: 08/23/07 Time: 12:22:00

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/21/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test19)

Initial Displacement: 21.74 ft
Total Well Penetration Depth: 86.8 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 86.8 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev

K = 0.2699 ft/day
y0 = 24.33 ft
**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test20)**

Initial Displacement: 25.48 ft  
Static Water Column Height: 60. ft  
Total Well Penetration Depth: 60. ft  
Screen Length: 14.75 ft  
Casing Radius: 0.08333 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
\[ K = 0.0485 \text{ ft/day} \]  
\[ y_0 = 23.76 \text{ ft} \]
**PROJECT INFORMATION**

Company: GZA GeoEnvironmental  
Client: Indian Point Energy Center  
Project: 41.0017869.10  
Location: Buchanan, New York  
Test Well: MW-67  
Test Date: 8/22/07

**AQUIFER DATA**

Saturated Thickness: 300. ft  
Anisotropy Ratio (Kz/Kr): 0.1

**WELL DATA (MW-67 Test21)**

Initial Displacement: 21.4 ft  
Total Well Penetration Depth: 44. ft  
Casing Radius: 0.08333 ft  
Static Water Column Height: 44. ft  
Screen Length: 14.75 ft  
Wellbore Radius: 0.159 ft

**SOLUTION**

Aquifer Model: Unconfined  
Solution Method: Hvorslev  
$K = 0.02087 \text{ ft/day}$  
y0 = 20.61 ft
MW-67 (TEST22)

Data Set: J:\...\MW-67 T22A.aqt
Date: 01/02/08
Time: 16:02:16

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/22/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67 Test22)

Initial Displacement: 15.34 ft
Total Well Penetration Depth: 34.5 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 34.5 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.04545 ft/day
y0 = 14.93 ft
MW-67 (TEST23)

Data Set: J:\...\MW-67 T23.aqt
Date: 01/02/08
Time: 21:23:58

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: MW-67
Test Date: 8/25/07

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-67Test23)

Initial Displacement: 13.83 ft
Total Well Penetration Depth: 24.4 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 24.4 ft
Screen Length: 14.75 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.931 ft/day
y0 = 14.58 ft
**PROJECT INFORMATION**

- **Company:** GZA GeoEnvironmental
- **Client:** Indian Point Energy Center
- **Project:** 41.0017869.10
- **Location:** Buchanan, New York
- **Test Well:** MW-67
- **Test Date:** 8/25/07

**AQUIFER DATA**

- **Saturated Thickness:** 300. ft
- **Anisotropy Ratio (Kz/Kr):** 0.1

**WELL DATA (MW-67Test24A)**

- **Initial Displacement:** 14.8 ft
- **Static Water Column Height:** 16.9 ft
- **Total Well Penetration Depth:** 16.9 ft
- **Screen Length:** 14.75 ft
- **Casing Radius:** 0.08333 ft
- **Wellbore Radius:** 0.159 ft

**SOLUTION**

- **Aquifer Model:** Unconfined
- **Solution Method:** Hvorslev
- **K:** 1.146 ft/day
- **y0:** 15.75 ft
MW-109 EXTRACTION

Data Set: J:\...\MW-109 sy May07 theis.aqt
Date: 09/12/07 Time: 14:28:16

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-109
Test Date: 5/10/07

AQUIFER DATA

Saturated Thickness: 300 ft
Anisotropy Ratio (Kz/Kr): 1

WELL DATA

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-109</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MW-109</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Cooper-Jacob

\[ T = 301.2 \text{ ft}^2/\text{day} \]

\[ S = 142.9 \]
MW-111 EXTRACTION TEST RECOVERY

Data Set: J:\...\sy111MW111 recovery.aqt
Date: 09/11/07
Time: 18:41:38

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: MW-111
Test Date: 5/30/06

AQUIFER DATA

Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (MW-111)

Initial Displacement: 2.552 ft
Total Well Penetration Depth: 8.47 ft
Casing Radius: 0.159 ft
Static Water Column Height: 5.5 ft
Screen Length: 8.47 ft
Wellbore Radius: 0.159 ft

SOLUTION

Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 3.518 ft/day
y0 = 2.859 ft
U3-3 EXTRACTION

Data Set: J:\...\U3-3 sy May07 theis.aqt
Date: 01/03/08 Time: 15:10:17

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: U3-3
Test Date: 5/11/07

WELL DATA

Pumping Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3-3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Observation Wells

<table>
<thead>
<tr>
<th>Well Name</th>
<th>X (ft)</th>
<th>Y (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3-3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[
T = 15.05 \text{ ft}^2/\text{day} \quad \quad S = 0.1398 \\
Kz/Kr = 1. \quad \quad b = 300. \text{ ft}^{-1}
\]
**Estimate Transmissivity from Specific Capacity Data**

\[
\begin{align*}
R &= 0.125 \quad \text{Radius of Well (FT.)} \\
S_0 &= 0.01 \quad \text{Storage Coefficient, Assumed} \\
\tau &= \frac{30}{1440} \quad \text{Pumping Duration (Days.)} \\
T &= 100 \quad \text{Transmissivity (GPD/FT) Initial Guess} \\
Q_p &= 0.225 \quad \text{Pumping Rate (GPM)} \\
s &= 6.5 \quad \text{Drawdown (FT.)} \\
\frac{Q_p}{s} &= 0.035 \quad \text{Specific Capacity (GPM/FT)} \\
\end{align*}
\]

\[
\alpha T := \text{root} \left( \frac{Q_p}{s} - \frac{T}{264 \log \left( \frac{0.3 - T - t}{R^2 S} \right)}, T \right)
\]

\[
T := \alpha T
\]

\[
T_{ft} := \frac{T}{7.48} \quad \text{Computed Transmissivity (GPD/ Ft)}
\]

\[
T_{ft} = 4 \quad \text{Computed Transmissivity (Sq.ft./Day)}
\]
U3-4S EXTRACTION

Data Set: J:\...\U3-4S sy May07 theis.aqt
Date: 09/12/07 Time: 14:29:51

PROJECT INFORMATION

Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, NY
Test Well: U3-4S
Test Date: 5/14/07

WELL DATA

<table>
<thead>
<tr>
<th>Pumping Wells</th>
<th>Observation Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Name</td>
<td>X (ft)</td>
</tr>
<tr>
<td>U3-4S</td>
<td>0</td>
</tr>
</tbody>
</table>

SOLUTION

Aquifer Model: Unconfined
Solution Method: Theis

\[ T = 333.5 \text{ ft}^2/\text{day} \]
\[ S = 0.2194 \]
\[ b = 300. \text{ ft} \]
I-2 EXTRACTION TEST RECOVERY

Data Set: J:\...\I-2 recovery.aqt
Date: 07/01/07 Time: 18:20:27

PROJECT INFORMATION
Company: GZA GeoEnvironmental
Client: Indian Point Energy Center
Project: 41.0017869.10
Location: Buchanan, New York
Test Well: I-2
Test Date: 5/22/07

AQUIFER DATA
Saturated Thickness: 300. ft
Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA (I-2)
Initial Displacement: 3.102 ft
Total Well Penetration Depth: 9.16 ft
Casing Radius: 0.08333 ft
Static Water Column Height: 9.16 ft
Screen Length: 9.16 ft
Wellbore Radius: 0.167 ft

SOLUTION
Aquifer Model: Unconfined
Solution Method: Hvorslev
K = 0.07849 ft/day
y0 = 3.198 ft
PNEUMATIC SLUG TEST LOG

GZA GEODEVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
PROJECT LOCATION: Indian Point

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 463090.6040 E 604657.5926
DATUM: NGVD 29
DATE: 5/9/07

WELL ID: MW - 36 - 26

NO. OF WELLS IN CLUSTER: 3
MEASUREMENTS TAKEN FROM:
- DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE = 26.00 FT
- DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE = 11.00 FT
- DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE = 3.71 FT
- WC: WATER COLUMN HEIGHT = 22.29 FT
- CH: CHANGE IN HEAD AFTER PRESSURIZATION = 5.00 FT
- AS: WATER COLUMN ABOVE SCREEN = 7.29 FT

DTB - DTW = WC
DTS - DTW = AS

CH / 2.31 = PSI
= PRESSURE APPLIED TO WELL HEAD

DTW** = TRANSDUCER READING = 13.943 FT
= TRANSDUCER DEPTH = 17.65 FT

Time Test Start: 14:04
Transducer Reading at test start: 13.966 FT
Time of Pressurization: 14:05
Time of Equilibrium: 14:10
Equilibrium Transducer Reading: 13.970 FT

Time of Pressure Release: 14:10
Time Test Stop: 14:12

NOTES:
** Static water level is 5.00' b/g. Depth to water used to calculate transducer depth was measured during a falling head period after displacement resulting from transducer installation. Due to time constraints and slow response time of this well, pressurization was administered before static water level had been re-established. However, achievement of equilibrium water levels after pressurization and depressurization of well head was determined based on static water level of 5.00' b/g. At 13:31, accidental adjustment of air flow regulator resulted in slight depressurization of well head. This adjustment was immediately corrected. Due to time constraints, only one pneumatic slug test was administered at this well.
Due to time constraints, only one pneumatic slug test was administered at this well.
**PNEUMATIC SLUG TEST LOG**

**GZA GEODEMICAL OF NEW YORK**

**Client:** Entergy

**WELL ID:** MW - 37 - 32

**Location:** Indian Point

**GZA ENGINEER:**
- Angela Hough
- Sara Covelli

**WELL DEPTH (FT):** 32.50

**WELL DIAMETER:** 1 INCH

**GROUND WATER DEPTH:** 10.2 FT

**NO. OF WELLS IN CLUSTER:** 4

**MEASUREMENTS TAKEN FROM:**
- Pressure Transducer Cable
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air
- Air In
- Air Out
- Ground Surface
- Well Casing / PVC

**LEGEND:**
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen
- DTW/2: Safe Margin
- PSI: Pressure Applied to Well Head

**Measurements:**
- DTB: 32.50 FT
- DTS: 28.00 FT
- DTW: 10.2 FT
- WC: 22.30 FT
- CH: 7.80 FT
- AS: 17.80 FT

**Calculation:**
- DTB - DTW = WC
- DTS - DTW = AS
- CH / 2.31 = PSI

**Pressure Transducer:**
- Reading at test start: 10.19 FT
- Depth: 10.416 FT

**Test Times:**
- Time Test Start: 0:19
- Time of Pressurization: 10:19
- Time of Equilibrium: 10:24
- Time of Pressure Release: 10:26
- Time Test Stop: 10:26

**NOTES:**
- 10:19 10:24
- 10:24
- 10:26

**Data:**
- GZA
- File No.: 41.0017869.01
- Ground Surface Well Casing / PVC
- Pressure Transducer Depth

**Diagram:**
- Pressure Gauge
- Pressure Regulator
- Data Logging
- Static Water Level
- Water Level Indicator
- Pressurized Water Level
- Screen
- Water Out During Pressurization
- Transducer Depth
- Transducer Reading

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy

**WELL ID:** MW - 37 - 32

**Location:** Indian Point

**GZA ENGINEER:**
- Angela Hough
- Sara Covelli

**WELL DEPTH (FT):** 32.50

**WELL DIAMETER:** 1 INCH

**GROUND WATER DEPTH:** 10.2 FT

**NO. OF WELLS IN CLUSTER:** 4

**MEASUREMENTS TAKEN FROM:**
- Pressure Transducer Cable
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air
- Air In
- Air Out
- Ground Surface
- Well Casing / PVC

**LEGEND:**
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen
- DTW/2: Safe Margin
- PSI: Pressure Applied to Well Head

**Measurements:**
- DTB: 32.50 FT
- DTS: 28.00 FT
- DTW: 10.2 FT
- WC: 22.30 FT
- CH: 7.80 FT
- AS: 17.80 FT

**Calculation:**
- DTB - DTW = WC
- DTS - DTW = AS
- CH / 2.31 = PSI

**Pressure Transducer:**
- Reading at test start: 10.19 FT
- Depth: 10.416 FT

**Test Times:**
- Time Test Start: 0:19
- Time of Pressurization: 10:19
- Time of Equilibrium: 10:24
- Time of Pressure Release: 10:26
- Time Test Stop: 10:26

**NOTES:**
- 10:19 10:24
- 10:24
- 10:26

**Data:**
- GZA
- File No.: 41.0017869.01
- Ground Surface Well Casing / PVC
- Pressure Transducer Depth

**Diagram:**
- Pressure Gauge
- Pressure Regulator
- Data Logging
- Static Water Level
- Water Level Indicator
- Pressurized Water Level
- Screen
- Water Out During Pressurization
- Transducer Depth
- Transducer Reading

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GZA GEOENVIRONMENTAL OF NEW YORK

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

GZA ENGINEER: Angela Hough
GZA ENGINEER: Sara Covelli

PROJECT LOCATION: Indian Point

WELL DESCRIPTION:

- BORING COORDINATES: N 46°30'7.5" E 60°46'4.8"
- GROUND SURFACE EL. (FT): 15.021
- DATE: 1/3/07
- DATE: 1/3/07
- WELL DEPTH (FT): 32.50
- GROUND WATER DEPTH: 10.2 FT
- PROJECT LOCATION: Indian Point
- FILE NO.: 41.0017869.01
- TEST NO.: 2 of 2

MEASUREMENTS TAKEN FROM:
- ground surface
- top of casing

LEGEND:

- DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE
- DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- WC: WATER COLUMN HEIGHT
- CH: CHANGE IN HEAD AFTER PRESSURIZATION
- AS: WATER COLUMN ABOVE SCREEN

- DTB = DTS + DTW
- WC = DTW
- CH = AS - DTW
- AS = DTW + SAFETY MARGIN
- CH = WATER LEVEL INDICATOR DEPTH
- CH / 2.31 = PSI

NOTES:

- PRESSURE APPLIED TO WELL HEAD
- WATER OUT DURING PRESSURIZATION
- PRESSURIZED WATER LEVEL

---

**PNEUMATIC SLUG TEST LOG**

**GZA GEOPHYSICAL SERVICES OF NEW YORK**

**WELL ID:** MW - 37 - 32

**Client:** Entergy

**Test No.:** 2 of 2

**Project Location:** Indian Point

- Depth to Bottom of Well from Ground Surface (DTB): 32.50 FT
- Depth to Well Screen from Ground Surface (DTS): 28.00 FT
- Depth to Static Water Level from Ground Surface (DTW): 10.2 FT
- Water Column Height (WC): 22.30 FT
- Change in Head after Pressurization (CH): 7.80 FT
- Water Column Above Screen (AS): 17.80 FT

- **Time Test Start:** 10:28
- **Transducer Reading at Test Start:** 10.461 FT
- **Time of Pressurization:** 10:26
- **Time of Equilibrium:** 10:28
- **Equilibrium Transducer Reading:** 10.461 FT
- **Time of Pressure Release:** 10:28
- **Time Test Stop:** 10:29

**Sciences and Engineers**

**GZA**

---
**Test was aborted 45 minutes after pressurization due to extremely slow equilibration period.**
NOTES:
High connectivity observed between test well mw37-57 and adjacent well mw37-40 during pressurization periods.
High connectivity observed between test well mw37-57 and adjacent well mw37-40 during pressurization periods. At 9:24 water was observed emerging from top of casing of mw37-40.

Throughout remainder of test, a few occasional bubbles were observed surfacing from bentonite within manhole.
PNEUMATIC SLUG TEST LOG

**Legend:**
- **DTB**: Depth to Bottom of Well from Ground Surface (104.00 ft)
- **DTS**: Depth to Well Screen from Ground Surface (79.00 ft)
- **DTW**: Depth to Static Water Level from Ground Surface (67.78 ft)
- **WC**: Water Column Height (36.22 ft)
- **CH**: Change in Head after Pressurization (8.22 ft)
- **AS**: Water Column Above Screen (11.22 ft)
- **DTW****: Depth to Transducer from Transducer Depth (67.78 ft)

**Measurements:**
- **DTB**: 104.00 ft
- **DTS**: 79.00 ft
- **DTW**: 67.78 ft
- **WC**: 36.22 ft
- **CH**: 8.22 ft
- **AS**: 11.22 ft
- **DTW**: 67.78 ft

**Calculations:**
- **WC =** \( \frac{CH}{2.31} \) = 3.56 PSI (Pressure Applied to Well Head)
- **DTW** = Transducer Reading - Transducer Depth = 27.399 ft

**Test Details:**
- Time Test Start: 8:49
- Transducer Reading at test start: 27.399 ft
- Time of Pressurization: 8:49
- Time of Equilibrium: 9:26
- Equilibrium Transducer Reading: 0.431 ft
- Time of Pressure Release: 9:26
- Time Test Stop: 10:21

**Notes:**
- Small air leak during test.
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

WELL ID: MW - 44 - 104

Client: Entergy Indian Point Energy Center

PROJECT LOCATION: Indian Point

WELL DEPTH (FT): 104.00
WELL DIAMETER: 1 INCH
GROUND WATER DEPTH: 67.78 FT
NO. OF WELLS IN CLUSTER: 2

MEASUREMENTS TAKEN FROM:
- ground surface
- top of casing

LEGEND:
- DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE
- DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- WC: WATER COLUMN HEIGHT
- CH: CHANGE IN HEAD AFTER PRESSURIZATION
- AS: WATER COLUMN ABOVE SCREEN
- DTS** = TRANSDUCER DEPTH
- DTW** = TRANSDUCER DEPTH

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<thead>
<tr>
<th></th>
<th>FT</th>
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<tbody>
<tr>
<td>DTB</td>
<td>104.00</td>
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<tr>
<td>DTS</td>
<td>79.00</td>
</tr>
<tr>
<td>DTW</td>
<td>67.78</td>
</tr>
<tr>
<td>WC</td>
<td>36.22</td>
</tr>
<tr>
<td>CH</td>
<td>11.22</td>
</tr>
<tr>
<td>AS</td>
<td>11.22</td>
</tr>
<tr>
<td>Safe Margin</td>
<td>8.22</td>
</tr>
<tr>
<td>Pressure Applied to Well Head</td>
<td>3.56 PSI</td>
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WATER LEVEL INDICATOR:

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<tbody>
<tr>
<td>CH / 2.31</td>
<td>3.56</td>
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<tr>
<td>= Pressure Applied to Well Head</td>
<td>76.00 FT</td>
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PRESSURE TRANSUDER:

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<tr>
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<tr>
<td>DTS</td>
<td>27.39</td>
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<tr>
<td>= Transducer Reading</td>
<td>95.18</td>
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Pressurized water level:

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<tbody>
<tr>
<td>DTS**</td>
<td>67.78</td>
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<tr>
<td>= Transducer Depth</td>
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PRESSURE REGULATOR:

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<tr>
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<td>Transducer Reading at test start</td>
<td>26.750</td>
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<tr>
<td>Time of Pressurization</td>
<td>10:21</td>
</tr>
<tr>
<td>Time of Equilibrium</td>
<td>10:56</td>
</tr>
<tr>
<td>Equilibrium Transducer Reading</td>
<td>27.390</td>
</tr>
<tr>
<td>Time of Pressure Release</td>
<td>10:56</td>
</tr>
<tr>
<td>Time Test Stop</td>
<td>12:06</td>
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</tbody>
</table>

NOTES:
Small air leak during test.
**PNEUMATIC SLUG TEST LOG**

**GZA GEODEVIRONMENTAL OF NEW YORK**

Client: Entergy

Indian Point Energy Center

Project Location: Indian Point

WELL ID: MW 45 - 62

<table>
<thead>
<tr>
<th>Well Depth (FT)</th>
<th>61.50</th>
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<tbody>
<tr>
<td>Well Diameter</td>
<td>1 INCH</td>
</tr>
<tr>
<td>Water Depth</td>
<td>24.01 FT</td>
</tr>
<tr>
<td>No. of Wells in Cluster</td>
<td>2</td>
</tr>
</tbody>
</table>

**Measurements Taken From:**
- Ground Surface
- Top of casing

**Legend:**
- **DTB**: Depth to Bottom of Well from Ground Surface
- **DTS**: Depth to Well Screen from Ground Surface
- **DTW**: Depth to Static Water Level from Ground Surface
- **WC**: Water Column Height
- **CH**: Change in Head after Pressurization
- **AS**: Water Column Above Screen

<table>
<thead>
<tr>
<th>Equation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB = DTW + WC</td>
<td>61.50 FT</td>
</tr>
<tr>
<td>DTB = DTS + DTW</td>
<td>51.50 FT</td>
</tr>
<tr>
<td>WC = CH + DTW</td>
<td>37.49 FT</td>
</tr>
<tr>
<td>WC = STA + CT</td>
<td>24.01 FT</td>
</tr>
<tr>
<td>AS = CH + DTS</td>
<td>27.49 FT</td>
</tr>
</tbody>
</table>

**Equation:**
- \[ \text{CH} / 2.31 = \text{PSI} \]

**Time Test Start:** 10:12

**Transducer Reading at test start:** 36.716 FT

**Time of Pressurization:** 10:12

**Time of Equilibrium:** 10:30

**Equilibrium Transducer Reading:** 36.990 FT

**Time Test Stop:** 11:14

**Notes:**
- 9:15 false start
- Small air leak during test.
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Test No: 2 of 2
File No: 654472-1201
Project Location: Indian Point

GZA ENGINEER: Angela Hough
Boring Coordinates: N 462385.5685 E 604472.1201
Datum: NGVD 29

Ground Surface EL (FT): 53.662
Top of Casing EL (FT): 53.217
Well Depth (FT): 61.50

Measurements Taken From:
- Ground Surface
- Top of Casing

Compressed Air or Nitrogen Line

Legend:
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen

DTB: 61.50 FT
DTS: 51.50 FT
DTW: 24.01 FT
WC: 37.49 FT
CH: 17.49 FT
AS: 27.49 FT

AS / 2.31 = PSI

NOTES:
Small air leak during test.

GZA
WELL ID: MW - 45 - 62
**PNEUMATIC SLUG TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client** Entergy

**WELL ID** MW - 48 - 38

**Test No.** 1 of 1

**Project Location** Indian Point Energy Center

**GZA ENGINEER** Angela Hough

**Boring Coordinates** N 462015.6992 E 603473.8128

**Datum** NGVD 29

**Well Location** Indian Point

**Well Depth (ft)** 37.45

**Well Diameter** 1 inch

**Ground Water Depth** 14.64 ft

**No. of Wells in Cluster** 2

**Ground Surface**

**GZATOP OF CASING EL. (FT)** 15.189

**Date** 5/25/07

**WELL DEPTH (FT)** 37.45

**GROUND WATER DEPTH** 14.64 FT

**NO. OF WELLS IN CLUSTER** 2

**STATIC WATER LEVEL DEPTH**

**MEASUREMENTS TAKEN FROM:**

- Pressure Transducer Cable
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air
- or Nitrogen Line
- Air In
- Air Out

**Legend:**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB</td>
<td>Depth to Bottom of Well from Ground Surface</td>
</tr>
<tr>
<td>DTS</td>
<td>Depth to Well Screen from Ground Surface</td>
</tr>
<tr>
<td>DTW</td>
<td>Depth to Static Water Level from Ground Surface</td>
</tr>
<tr>
<td>DTW*</td>
<td>Depth to Transducer Depth</td>
</tr>
<tr>
<td>WC</td>
<td>Water Column Height</td>
</tr>
<tr>
<td>CH</td>
<td>Change in Head after Pressurization</td>
</tr>
<tr>
<td>AS</td>
<td>Water Column Above Screen</td>
</tr>
</tbody>
</table>

**Equations:**

- \[ DTB = DTS + DTW \]
- \[ WC = DTW + CH \]
- \[ CH = \frac{WC}{2.31} \]
- \[ CH = DTB - DTW \]

**Pressurization Measurements:**

- **Time Test Start:** 11:12
- **Transducer Reading at test start:** 21.706
- **Time of Pressurization:** 11:15
- **Time of Equilibrium:** 11:17
- **Equilibrium Transducer Reading:** 21.706
- **Time of Pressure Release:** 11:18
- **Time Test Stop:** 11:20

**Notes:**

- Small air leak during test.

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**WELL ID** MW - 48 - 38

**Entergy**

**Indian Point Energy Center**

**440 Ninth Avenue, 18th Floor**

**New York, New York 10001**

**File No.** 41.0017869.10

**Scientist and Engineers**

- Angela Hough

---
GZA GEOFUNITURAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

GZA ENGINEER Angela Hough

BORING COORDINATES
N 462015.6992
E 603473.8128
DATUM NGVD 29

GZA ENGINEER
GROUND SURFACE EL. (FT) 15.387
TOP OF CASING EL. (FT) 15.189
WELL DEPTH (FT) 37.45

WELL DIAMETER 1 INCH
GROUND WATER DEPTH 14.64 FT

NO. OF WELLS IN CLUSTER 2
(STATIC WATER LEVEL DEPTH)

MEASUREMENTS TAKEN FROM:
ground surface

LEGEND:

DTB DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS DEPTH TO WELL SCREEN FROM GROUND SURFACE
DTW DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
WC WATER COLUMN HEIGHT
CH CHANGE IN HEAD AFTER PRESSURIZATION
AS WATER COLUMN ABOVE SCREEN

DTB = DTS + DTW
DTB = WC
DTB = AS

DTW = CH - DTB
DTB** = TRANSUDER READING
DTB** = TRANSUDER DEPTH + DTW

PRESSURE GAUGE
PRESSURE REGULATOR
PRESSURE TRANSDUCER
DATALOGGING

NOTES:
Small air leak during the test.

GZA WELL ID MW - 48 - 38

Indian Point Energy Center

PNEUMATIC SLUG TEST LOG

WELL ID MW - 48 - 38
TEST NO. 1 of 1
FILE NO. 41.0017869.10
PROJECT LOCATION Indian Point

Time Test Start 11:20
Transducer Reading at test start 21.699 FT
Time of Pressurization 11:21
Time of Equilibrium 11:24
Equilibrium Transducer Reading 21.695 FT
Time of Pressure Release 11:24
Time Test Stop 11:28
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 462015.6992  E 603473.8128
GZA ENGINEER: Angela Hough
GROUND SURFACE EL. (FT): 15.387
GZA ENGINEER: Angela Hough
TOP OF CASING EL. (FT): 15.189
GZA ENGINEER: Angela Hough
WELL DEPTH (FT): 37.45

MEASUREMENTS TAKEN FROM:
- ground surface
- tip of casing

LEGEND:
- DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE
- DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- WC: WATER COLUMN HEIGHT
- CH: CHANGE IN HEAD AFTER PRESSURIZATION
- AS: WATER COLUMN ABOVE SCREEN
- DTS + DTW = WC
- DTW + TRANSDUCER READING = PRESSURE APPLIED TO WELL HEAD
- WC = WATER LEVEL INDICATOR DEPTH
- CH/2.31 = PSI

NOTES:
- Small air leak during the test.
**PNEUMATIC SLUG TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**GZA ENGINEER**
Angela Hough
Sara Covelli

**PROJECT LOCATION**
Indian Point

**MEASUREMENTS TAKEN FROM:**
- ground surface
- top of casing

**PNEUMATIC SLUG TEST LOG**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB</td>
<td>Depth to Bottom of Well from Ground Surface</td>
<td>42.00 ft</td>
</tr>
<tr>
<td>DTS</td>
<td>Depth to Well Screen from Ground Surface</td>
<td>32.00 ft</td>
</tr>
<tr>
<td>DTW</td>
<td>Depth to Static Water Level from Ground Surface</td>
<td>13.01 ft</td>
</tr>
<tr>
<td>WC</td>
<td>Water Column Height</td>
<td>28.99 ft</td>
</tr>
<tr>
<td>CH</td>
<td>Change in Head after Pressurization</td>
<td>8.99 ft</td>
</tr>
<tr>
<td>AS</td>
<td>Water Column Above Screen</td>
<td>18.99 ft</td>
</tr>
</tbody>
</table>

**NOTES:**
- Two wells in borehole, three wells in cluster
- 8:37 false start
- Small air leak during test
- Pressure applied to well head = \( \frac{CH \times 2.31}{DTS} \)
- Pressure Gauge = 28.449 psi
- Pressure Regulator = 41.46 psi

**GZA**
WELL ID: MW - 49 - 42
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Indian Point Energy Center
WELL ID: MW - 49 - 42
TEST NO. 1 of 2
FILE NO. 41.0017869.01
PROJECT LOCATION: Indian Point

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 46°30'7.8328" E 60°44'46.6184"
DATUM: NGVD 29

GZA ENGINEER: Sara Covelli
GROUND SURFACE EL. (FT): 14.628
DATE: 5/9/07

WELL DIAMETER: 2 INCH
GROUND WATER DEPTH: 13.01 FT
WELL DEPTH (FT): 42.00
NO. OF WELLS IN CLUSTER: 2*

Measurements taken from:
- ground surface
- top of casing

Measurements:
- Pressure Transducer Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line
- Water Level Indicator Cable
- Pressure Gauge
- Pressure Regulator

Legend:
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen
- DTS = DTW + TRANSDUCER DEPTH
- DTW = DTB - DTW
- WC = DTS - DTW
- AS = CH + DTW
- CH = PRESSURE APPLIED TO WELL HEAD
- CH / 2.31 = PSI

Table:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value (FT)</th>
</tr>
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<tbody>
<tr>
<td>DTB</td>
<td>42.00</td>
</tr>
<tr>
<td>DTS</td>
<td>32.00</td>
</tr>
<tr>
<td>DTW</td>
<td>13.01</td>
</tr>
<tr>
<td>WC</td>
<td>28.99</td>
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<td>AS</td>
<td>18.99</td>
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<tr>
<td>CH</td>
<td>8.99</td>
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<td>Time Test Start</td>
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<tr>
<td>Transducer Reading</td>
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<td>Time of Equilibrium</td>
<td>9:02</td>
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<tr>
<td>Equilibrium Reading</td>
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<tr>
<td>Time Test Stop</td>
<td>9:09</td>
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Notes:
- * Two wells in borehole, three wells in cluster
Client WELL ID MW - 49 - 65
440 NINTH AVENUE, 18th FLOOR TEST NO. 1 of 2
NEW YORK, NEW YORK 10001 FILE NO. 41.0017869.01
PROJECT LOCATION Indian Point

GZA GEOSCIENTS AND ENGINEERS

GZA ENGINEER
Angela Hough
Sara Covelli
Miguel Britos

PROJECT LOCATION
Indian Point

WELL DEPTH (FT) 65.00
WELL DIAMETER 1 INCH
GROUND WATER DEPTH 12.68 FT

NO. OF WELLS IN CLUSTER 2

MEASUREMENTS TAKEN FROM:
- PRESSURE TRANSDUCER CABLE
- WATER LEVEL INDICATOR CABLE
- LEAK TEST VALVE
- RELEASE VALVE
- COMPRESSED AIR OR NITROGEN LINE
- AIR IN
- AIR OUT
- GROUND SURFACE
- WELL CASING / PVC

GZA

LEGEND:
- DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE 65.00 FT
- DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE 60.00 FT
- DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE 12.68 FT
- WC: WATER COLUMN HEIGHT 52.32 FT
- CH: CHANGE IN HEAD AFTER PRESSURIZATION 37.32 FT
- AS: WATER COLUMN ABOVE SCREEN 47.32 FT

GZA

NOTES:
* Two wells in borehole, three wells in cluster
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Project Location: Indian Point Energy Center

WELL ID: MW - 49 - 65

GZA ENGINEER
Angela Hough
Ground Surface El. (FT): 14.628
Datum: NGVD 29

Sara Covelli
Top of Casing El. (FT): 14.457
Date: 5/4/07

Miguel Britos
Well Depth (FT): 65.00

WELL DEPTH (FT): 65.00
WELL DIAMETER: 1 INCH
GROUND WATER DEPTH: 12.68 FT

NO. OF WELLS IN CLUSTER: 2*
MEASUREMENTS TAKEN FROM:
- PRESSURE TRANSDUCER CABLE ground surface
top of casing
- WATER LEVEL INDICATOR CABLE
- LEAK TEST VALVE
- RELEASE VALVE
- COMPRESSED AIR OR NITROGEN LINE
- AIR IN
- AIR OUT

GROUND SURFACE WELL CASING / PVC

LEGEND:
DTB DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE 65.00 FT
DTS DEPTH TO WELL SCREEN FROM GROUND SURFACE 60.00 FT
DTW DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE 12.68 FT
WC WATER COLUMN HEIGHT 52.32 FT
CH CHANGE IN HEAD AFTER PRESSURIZATION 37.32 FT
AS WATER COLUMN ABOVE SCREEN 47.32 FT

DTB - DTW = WC
DTS - DTW = AS

CH = WATER LEVEL INDICATOR DEPTH

CH / 2.31 = PSI

DTW** + TRANSDUCER READING = DTS
TRANSDUCER DEPTH = 64.99 FT

Time Test Start: 14:49
Transducer Reading at test start: 52.310 FT
Time of Pressure Release: 14.57
Time Test Stop: 15:03
Time of Equilibrium Reading: 14.57

NOTES:
* Two wells in borehole, three wells in cluster
### PNEUMATIC SLUG TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**SCIENTISTS AND ENGINEERS**

**GZA ENGINEER** Angela Hough

**GZA ENGINEER** Sara Covelli

**WELL ID**: MW - 50 - 42

**Client**: Entergy

**Test No.**: T-122

**File No.**: 11-007-0001

**Project Location**: Indian Point

---

**Client WELL ID MW - 50 - 42**

**440 NINTH AVENUE, 18th FLOOR**

**TEST NO. 1 of 2**

**NEW YORK, NEW YORK 10001**

**FILE NO. 41.0017869.01**

**PROJECT LOCATION**: Indian Point

**MEASUREMENTS TAKEN FROM**

- **ground surface**
- **top of casing**

**WELL DEPTH (FT)**: 42.00

**WELL DIAMETER**: 2 INCH

**GROUND WATER DEPTH**: 7.32 FT

**NO. OF WELLS IN CLUSTER**: 2

**BORING COORDINATES**

- N 463039.1827
- E 604494.2976

**GROUND SURFACE EL.(FT)**: 14.92

**TOP OF CASING EL.(FT)**: 14.45

**WELL DEPTH (FT)**: 42.00

**DATE**: 5/9/07

**GROUND SURFACE WELL CASING / PVC**

**DTB**: 42.00 FT

**DTS**: 22.00 FT

**DTW**: 7.32 FT

**WC**: 34.88 FT

**CH**: 14.68 FT

**AS**: 14.68 FT

**SAFE MARGIN**: 10.68 FT

**PRESSURE APPLIED TO WELL HEAD**: 10.68 FT

**WATER LEVEL INDICATOR DEPTH**: 14.68 FT

**PRESSURIZED WATER LEVEL**: 14.68 FT

**PRESSURE TRANSDUCER DEPTH**: 7.32 FT

**PRESSURE TRANSDUCER READING**: 27.049 FT

**PRESSURE TRANSUDER CABLE**

**WATER LEVEL INDICATOR CABLE**

**LEAK TEST VALVE**

**RELEASE VALVE**

**PRESSURE GAUGE**

**PRESSURE REGULATOR**

**DATALOGGING**

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**NOTES:**

**PRESSURE APPLIED TO WELL HEAD**

- **DTB**: 42.00 FT
- **DTS**: 22.00 FT
- **DTW**: 7.32 FT
- **WC**: 34.88 FT
- **CH**: 10.68 FT
- **AS**: 14.68 FT
- **SAFE MARGIN**: 4.00 FT
- **WATER LEVEL INDICATOR DEPTH**: 18.00 FT

**CH / 2.31 = 4.62 PSI**

**WATER OUT DURING PRESSURIZATION**

**PRESSURE APPLIED TO WELL HEAD**: 10.68 FT

**WATER OUT DURING PRESSURIZATION**

---

**GZA**

**WELL ID**: MW - 50 - 42
PNEUMATIC SLUG TEST LOG

LEGEND:

DTB  DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS  DEPTH TO WELL SCREEN FROM GROUND SURFACE
DTW  DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
WC   WATER COLUMN HEIGHT
CH   CHANGE IN HEAD AFTER PRESSURIZATION
AS   WATER COLUMN ABOVE SCREEN

DTB = DTS - DTW = WC
DTW = DTS - DTW = AS

CH / 2.31 = PSI

DTW** + TRANSDUCER READING = PRESSURE APPLIED TO WELL HEAD

NOTES:

Time Test Start 12:01
Transducer Reading at test start 27.049

Time of Pressurization 12:01
Time of Equilibrium 12:07
Equilibrium Transducer Reading 27.126

12:08
Time of Pressure Release
12:11
Time Test Stop
Client: ENTEGY

GZA ENGINEER: Angela Hough
Sara Covelli

GZA ENGINEER:

Location: Indian Point

WELL ID: MW - 53 - 120

Boring Coordinates:
N 462821.6935
E 604732.2667

Datum: NGVD 29

Ground Surface EL (FT): 70.26
Top of Casing EL (FT): 70.19
Well Depth (FT): 120

WELL DIAMETER: 1 INCH

GROUND WATER DEPTH: 60.8 FT

NO. OF WELLS IN CLUSTER: 2

PROJECT LOCATION: Indian Point

FILE NO.: 41.0017869.01

TEST NO.: 1 of 2

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA SCIENTISTS AND ENGINEERS

LEGEND:

- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen
- SAFE MARGIN
- WATER LEVEL INDICATOR DEPTH
- PRESSURIZED WATER LEVEL
- PRESSURE APPLIED TO WELL HEAD
- TRANSUDER DEPTH
- TIME TEST START
- TIME OF PRESSURIZATION
- TIME OF EQUILIBRIUM
- TIME TEST STOP

NOTES:

PNEUMATIC SLUG TEST LOG

DTW = 60.80
AS = 39.20

WATER OUT DURING PRESSURIZATION

PRESSURE GAUGE

PRESSURE REGULATOR

LEAK TEST VALVE

RELEASE VALVE

GROUNDSURFACE

WELL CASING / PVC

CH 29.20

33.906)

33.952

14:19

13:32

13:33

13:57

33.952

14:19

Time Test Start

Transducer Reading at test start

Time of Pressurization

Time of Equilibrium

Equilibrium Transducer Reading

GZA

WELL ID: MW - 53 - 120
GZA GEODEVELOPMENTAL NEW YORK

WELL ID: MW - 53 - 120

Client: Entergy

Indian Point Energy Center

GZA GEOLGICAL ENGINEERS

PROJECT LOCATION: Indian Point

WELL LOCATION: MW  - 53  - 120

GZA ENGINEER: Angela Hough

BORING COORDINATES: N 462821.6935 E 604732.2667

WELL SURFACE EL: 70.25 DATUM: NGVD 29

GZA ENGINEER: Sara Covelli

TOP OF CASING EL: 70.19 DATE: 12/28/06

WELL DEPTH: 120

GROUND WATER DEPTH: 60.8 FT

NO. OF WELLS IN CLUSTER: 2

PROJECT LOCATION: Indian Point

LEGEND:

DTB: Depth to Bottom of Well from ground surface = 120.00 FT

DTS: Depth to Well Screen from ground surface = 100.00 FT

DTW: Depth to Static Water Level from ground surface = 60.80 FT

WC: Water Column Height = 59.20 FT

CH: Change in head after pressurization = 29.20 FT

AS: Water column above screen = 39.20 FT

SAFE MARGIN = CH - DTW = 90.00 FT

PRESSURE APPLIED TO WELL HEAD = AS / 2.31 = 33.691 PSI

PRESSURIZED WATER LEVEL = DTW + AS

WATER OUT DURING PRESSURIZATION

PRESSURE TRANSDUCER

PRESSURE REGULATOR

DTB

DTS

DTW

WATER LEVEL INDICATOR

PRESSURIZED WATER LEVEL

SCREEN

WATER OUT DURING PRESSURIZATION

NOTES:

Time Test Start: 14:19

Transducer Reading at test start: 33.827 FT

Time of Pressurization: 14:20

Time of Equilibrium: 14:49

Equilibrium Transducer Reading: 33.742 FT

Time of Pressure Release: 14:49

Time Test Stop: 15:08
**PNEUMATIC SLUG TEST LOG**

**Client:** Entergy

**GZA ENGINEER:** Angela Hough

**BORING COORDINATES:** N 462997.0065 E 664636.4717

**GROUND SURFACE EL. (FT):** 18.25

**DATUM:** NGVD 29

**DATE:** 12/27/06

**WELL DEPTH (FT):** 24

**WELL DIAMETER:** 1 INCH

**GROUND WATER DEPTH:** 10.52 FT

**NO. OF WELLS IN CLUSTER:** 3

**PROJECT LOCATION:** Indian Point

**LEAK TEST VALVE:**

**RELEASE VALVE:**

**COMPRESSED AIR OR NITROGEN LINE:**

**LEGEND:**

- **DTB:** Depth to Bottom of Well from Ground Surface
- **DTS:** Depth to Well Screen from Ground Surface
- **DTW:** Depth to Static Water Level from Ground Surface
- **WC:** Water Column Height
- **CH:** Change in Head after Pressurization
- **AS:** Water Column Above Screen
- **WC** + **DTW** = **AS**
- **DTW** + **TRANSDUCER READING** = **AS**
- **CH**/2.31 = **PSI**

**MEASUREMENTS TAKEN FROM:**

- **ground surface**
- **top of casing**

**WELL ID:** MW - 55 - 24

**NOTES:**

- Time Test Start: 8:58
- Time of Pressurization: 8:58
- Time of Equilibrium: 9.03
- Equilibrium Transducer Reading: 8.902 FT
- Time of Pressure Release: 9:03
- Time Test Stop: 9:07

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**SCIENTISTS AND ENGINEERS**

**FILE NO.:** 41.0017869.01

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**Entergy Indian Point Energy Center**
### Pneumatic Slug Test Log

#### Details
- **Client:** Entergy
- **Location:** Indian Point Energy Center
- **WELL ID:** MW - 55 - 24
- **File No.:** 41001786901

#### Site Information
- **Client WELL ID:** MW - 55 - 24
- **Address:** 440 Ninth Avenue, 18th Floor
- **City:** New York, New York 10001
- **Test No.:** 212
- **File No.:** 41001786901
- **Location:** Indian Point

#### Details:
- **GZA Engineer:**
  - Angela Hough: Boring Coordinates N 462997.0065 E 184636.4717
  - Sara Covelli: Ground Surface EL.(FT) 18.25 Datum NGVD 29
  - Rick Ponti: Top of Casing EL.(FT) 17.77 Date 12/27/06
- **Well Depth (FT):** 24
- **Well Diameter:** 1 inch
- **Ground Water Depth:** 10.52 FT
- **No. of Wells in Cluster:** 3
- **Measurement Techniques:**
  - Pressure Transducer Cable
  - Water Level Indicator Cable
  - Leak Test Valve
  - Release Valve

#### Measurements:
- **DTW:** Depth to Static Water Level from Ground Surface
- **DTS:** Depth to Well Screen from Ground Surface
- **DTB:** Depth to Bottom of Well from Ground Surface
- **T:** Transducer Reading
- **WC:** Water Column Height (FT)
- **CH:** Change in Head after Pressurization (FT)
- **AS:** Water Column Above Screen (FT)
- **PSI:** Pressure Applied to Well Head

#### Formulas:
- \[ \text{DTW} = \text{DTB} - \text{DTW} \]
- \[ \text{DTS} = \text{DTB} - \text{DTW} \]
- \[ \text{WC} = \text{DTS} + \text{CH} \]
- \[ \text{AS} = \text{CH} + \text{DTW} \]
- \[ \text{PSI} = \frac{\text{CH}}{2.31} \]

#### Test Data:
- **Time Test Start:** 9:08
- **Transducer Reading at test start:** 8.944 FT
- **Time of Pressurization:** 9:08
- **Time of Equilibrium:** 9:14
- **Equilibrium Transducer Reading:** 8.975 FT
- **Time of Pressure Release:** 9:14
- **Time Test Stop:** 9:19

### Diagram
- Diagram of well testing setup with labeled components:
  - Compressed Air or Nitrogen Line
  - Pressure Regulator
  - Pressure Gauge
  - Datalogging

### Notes:
- **GZA Eco-Environmental of New York**
- **Scientist and Engineers**

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**GZA**

**WELL ID:** MW - 55 - 24
**PNEUMATIC SLUG TEST LOG**

**Client:** Indian Energy Center  
**Location:** Entergy Indian Point

**GZA ENGINEER:** Angela Hough  
**Boring Coordinates:** N. 462997.1961 E. 604636.481  
**Datum:** NGVD 29

**No. of Wells in Cluster:** 3  
**Well DIAMETER:** 1 inch  
**Ground WATER DEPTH:** 10.88 ft

**Measurements Taken From:**  
- Ground surface
- Top of casing

**Legend:**
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- AS: Water Column Above Screen
- CH: Change in Head after Pressurization
- DTW / 2.31 = PSI

**Calculations:**
- \( \text{DTB} = 35.00 \text{ ft} \)
- \( \text{WC} = 24.12 \text{ ft} \)
- \( \text{DTW} = 10.88 \text{ ft} \)
- \( \text{AS} = 19.12 \text{ ft} \)
- \( \text{CH} = 14.12 \text{ ft} \)
- \( \text{CH} / 2.31 = 6.11 \text{ PSI} \)
- \( \text{Transducer Reading} = 22.737 \text{ ft} \)
- \( \text{Pressure Applied to Well Head} = 25.00 \text{ PSI} \)

**Notes:**
- False start upon pressurization at 10:46. Air leak detected.
- False start upon pressurization at 10:47. Air leak detected and resolved.
- Actual pressurization start at 10:50.
PNEUMATIC SLUG TEST LOG

GZA GEGEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Test No.: 1 of 2

Project Location: Indian Point

GZA ENGINEER: Angela Hough
Boring Coordinates: N 462997.1735 E 684636.5227
Datum: NGVD 29

Well ID: MW - 55 - 54

<table>
<thead>
<tr>
<th>Well Diameter</th>
<th>Ground Water Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>54 ft</td>
<td>10.6 ft</td>
</tr>
</tbody>
</table>

No. of Wells in Cluster: 1

Measurements Taken From:
- Ground Surface
- Top of Casing

Legend:
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head After Pressurization
- AS: Water Column Above Screen

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB</td>
<td>54.00 ft</td>
</tr>
<tr>
<td>DTS</td>
<td>44.00 ft</td>
</tr>
<tr>
<td>DTW</td>
<td>10.60 ft</td>
</tr>
<tr>
<td>WC</td>
<td>33.40 ft</td>
</tr>
<tr>
<td>CH</td>
<td>28.40 ft</td>
</tr>
<tr>
<td>AS</td>
<td>33.40 ft</td>
</tr>
<tr>
<td>CH / 231 =</td>
<td>12.29 PSI</td>
</tr>
<tr>
<td>WC + DTW</td>
<td>39.00 ft</td>
</tr>
<tr>
<td>STB</td>
<td>10.60 ft</td>
</tr>
<tr>
<td>Transducer Reading</td>
<td>34.827 ft</td>
</tr>
<tr>
<td>Transducer Depth</td>
<td>45.43 ft</td>
</tr>
</tbody>
</table>

Time Test Start: 11:29
Transducer Reading at test start: 34.839 ft

Time of Pressurization: 11:32
Time of Equilibrium: 11:36
Equilibrium Transducer Reading: 34.887 ft

Time Test Stop: 11:42

Notes:
False start (pressurization) at 11:30. Leak detected and resolved. Restart pressurization at 11:32.
GZA GEONENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

CLIENT: WELL ID: MW - 55 - 54
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

PROJECT LOCATION: Indian Point

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 462997.1735 E 604636.5227
GROUND SURFACE EL. (FT): 18.25
DATUM: NGVD 29

GZA ENGINEER: Sara Covelli
TOP OF CASING EL. (FT): 17.77
DATE: 12/27/06

GZA ENGINEER: Rick Ponti
WELL DEPTH (FT): 54
WELL DIAMETER: 1 INCH
GROUND WATER DEPTH: 10.6 FT
NO. OF WELLS IN CLUSTER: 3

WELL DEPTH (FT) = TOP OF CASING EL. (FT) + GROUND WATER DEPTH

WELL DEPTH (FT) = 17.77 + 10.6 = 28.37 FT

GROUND SURFACE EL. (FT) = 18.25 FT

GZA GEONENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA
WELL ID: MW - 55 - 54

NOTES:

DTB = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS = DEPTH TO WELL SCREEN FROM GROUND SURFACE
Wc = WATER COLUMN HEIGHT
AS = WATER COLUMN ABOVE SCREEN

WATER LEVEL INDICATOR DEPTH = CH

PRESSURE APPLIED TO WELL HEAD = CH / 2.31

PRESSURE TRANSDUCER READING = DTW

PRESSURE REGULATOR

PRESSURE GAUGE

GZA
WELL ID: MW - 55 - 54

NOTES:
Due to an obstruction in MW-56-85 at approximately 53 ft b/g, pressure transducer could not be lowered enough to log more than a 5 ft change in head.
Due to an obstruction in MW-56-85 at approximately 53 ft b/g, pressure transducer could not be lowered enough to log more than a 5 ft change in head.
Due to the minimal extent of the water column above the screen in this well, the well was pressurized to drive the water column to the midpoint of the screen (8.5 ft b.g.).

Note that DTS for this test is the midpoint of the well screen.

Results of this test will be compared with sustained yield test (administered with a peristaltic pump) results for this well.
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

GZA ENGINEER Angela Hough
GZA ENGINEER Sara Covelli
GZA ENGINEER Rick Ponti

WELL ID MW  - 57  - 11

PROJECT LOCATION Indian Point

BORING COORDINATES N 462888.6888   E 604562.9404

GROUND SURFACE EL (FT) 14.98
DATUM NGVD 29

TOP OF CASING EL (FT) 14.73
DATE 12/26/06

WELL DEPTH (FT) 11

WELL DIAMETER 1 INCH

GROUND WATER DEPTH 5.05 FT

NO. OF WELLS IN CLUSTER 3

MEASUREMENTS TAKEN FROM:
PRESSURE TRANSDUCER CABLE
WATER LEVEL INDICATOR CABLE
LEAK TEST VALVE
RELEASE VALVE
COMPRESSED AIR OR NITROGEN LINE

LEGEND:
DTB DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS DEPTH TO WELL SCREEN FROM GROUND SURFACE
DTW DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
WC WATER COLUMN HEIGHT
CH CHANGE IN HEAD AFTER PRESSURIZATION
AS WATER COLUMN ABOVE SCREEN

DTB = 11.00 FT
DTS = 8.50 FT
DTW = 5.05 FT
WC = 5.95 FT
CH = 3.45 FT
AS = 3.45 FT

CH / 2.31 = 1.49 PSI
= PRESSURE APPLIED TO WELL HEAD

DTW = 5.05 FT
TRANSDUCER READING = 5.502 FT
TRANSDUCER DEPTH = 10.55 FT

Time Test Start 13:39
Transducer Reading at test start 5.502 FT

Time of Pressurization 13:39
Time of Equilibrium 13:41
Equilibrium Transducer Reading 6.444 FT

Due to the minimal extent of the water column above the screen in this well, the well was pressurized to drive the water column to the midpoint of the screen (8.5 ft b/g).

Note that DTS for this test is the midpoint of the well screen.

Results of this test will be compared with sustained yield test (administered with a peristaltic pump) results for this well.

NOTES:
NOTES:

Air leak was detected and resolved upon initial pressurization.
### PNEUMATIC SLUG TEST LOG

#### GZA GEOENVIRONMENTAL OF NEW YORK

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**

**STUDENTS AND ENGINEERS**

**GZA ENGINEER Angela Hough**
**BORING COORDINATES**
N 462888.8986
E 694682.8559
**DATUM**
NGVD 29

**GZA ENGINEER Sara Covelli**
**GROUND SURFACE EL. (FT)**
14.98
**DATE**
12/26/06

**GZA ENGINEER Rick Ponti**
**TOP OF CASING EL. (FT)**
14.75
**WELL DEPTH (FT)**
20.5

**NO. OF WELLS IN CLUSTER**
3

**WELL DIAMETER**
1 INCH
**GROUND WATER DEPTH**
5.64 FT

**MEASUREMENTS TAKEN FROM:**
- Pressure Transducer Cable
- Water Level Indicator Cable
- LEAK TEST VALVE
- RELEASE VALVE
- COMPRESSED AIR OR NITROGEN LINE
- AIR IN
- AIR OUT
- GROUND SURFACE
- WELL CASING / PVC

**LEGEND:**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB</td>
<td>Depth to bottom of well from ground surface</td>
</tr>
<tr>
<td>DTS</td>
<td>Depth to well screen from ground surface</td>
</tr>
<tr>
<td>DTW</td>
<td>Depth to static water level from ground surface</td>
</tr>
<tr>
<td>WC</td>
<td>Water column height</td>
</tr>
<tr>
<td>CH</td>
<td>Change in head after pressurization</td>
</tr>
<tr>
<td>AS</td>
<td>Water column above screen</td>
</tr>
<tr>
<td>DTS</td>
<td>Depth to top of casing from ground surface</td>
</tr>
<tr>
<td>DTB</td>
<td>Depth to bottom of well from top of casing</td>
</tr>
<tr>
<td>WC</td>
<td>Water column height above top of casing</td>
</tr>
</tbody>
</table>

**Calculation Formulas:**

:\[
\begin{align*}
\text{DTB} & = 20.50 \text{ FT} \\
\text{DTS} & = 15.50 \text{ FT} \\
\text{DTW} & = 5.64 \text{ FT} \\
\text{WC} & = 14.86 \text{ FT} \\
\text{CH} & = 6.86 \text{ FT} \\
\text{AS} & = 9.86 \text{ FT} \\
\text{DTB} - \text{DTW} & = \text{WC} \\
\text{DTS} & = \text{DTB} - \text{DTW} \\
\text{CH} & = \text{WC} - \text{DTW} \\
\text{AS} & = \text{WC} - \text{DTW} \\
\text{DTW} & + \text{TRANSDUCER READING} = 11.772 \text{ FT} \\
\text{DTW} & + \text{TRANSDUCER DEPTH} = 17.41 \text{ FT} \\
\text{CH} / 2.31 & = 2.97 \text{ PSI} \\
\text{DTB} & = \text{PRESSURE APPLIED TO WELL HEAD} \\
\end{align*}
\]

**MEASURED VALUES:**

- Time Test Start: 11:21
- Transducer Reading at test start: 11.841 FT
- Time of Pressurization: 11:21
- Time of Equilibrium: 11:25
- Equilibrium Transducer Reading: 11.866 FT

**NOTES:**
### PNEUMATIC SLUG TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**

**GZA ENGINEER**

- **Angela Hough**: BORING COORDINATES N 462888.6589 E 604562.8432
- **Sara Covelli**: GROUND SURFACE EL. (FT) 14.98 DATUM NGVD 29
- **TOP OF CASING EL. (FT)**: 14.81 DATE 12/26/06

**GZA ENGINEER**

- **WELL DEPTH (FT)**: 45.5
- **WELL DIAMETER**: 1 INCH
- **GROUND WATER DEPTH**: 6.29 FT
- **WELL ID**: MW  - 57  - 45

### MEASUREMENTS TAKEN FROM

- **ground surface**: LEAK TEST VALVE
- **top of casing**: RELEASE VALVE
- **WATER LEVEL INDICATOR CABLE**
- **PRESSURE TRANSDUCER CABLE**
- **COMPRessed AIR OR NITROGEN LINE**

### LEGEND:

- **DTB**: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE 45.50 FT
- **DTS**: DEPTH TO WELL SCREEN FROM GROUND SURFACE 30.50 FT
- **DTW**: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE 6.29 FT
- **WC**: WATER COLUMN HEIGHT 39.21 FT
- **CH**: CHANGE IN HEAD AFTER PRESSURIZATION 19.21 FT
- **AS**: WATER COLUMN ABOVE SCREEN 24.21 FT

\[\begin{align*}
\text{DTB} & = 45.50 \text{ FT} \\
\text{DTS} & = 30.50 \text{ FT} \\
\text{DTW} & = 6.29 \text{ FT} \\
\text{WC} & = 39.21 \text{ FT} \\
\text{CH} & = 19.21 \text{ FT} \\
\text{AS} & = 24.21 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{CH} / 2.31 & = 8.32 \text{ PSI} \\
\text{AS} & \text{ WATER LEVEL INDICATOR DEPTH} 25.50 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{DTW} & = 6.29 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{DTS} & = 6.29 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{DTW} & = 45.15 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{DTB} & = 45.50 \text{ FT} \\
\text{DTS} & = 30.50 \text{ FT} \\
\text{DTW} & = 6.29 \text{ FT} \\
\text{WC} & = 39.21 \text{ FT} \\
\text{CH} & = 19.21 \text{ FT} \\
\text{AS} & = 24.21 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{CH} & = 19.21 \text{ FT} \\
\text{AS} & = 24.21 \text{ FT} \\
\text{WC} & = 39.21 \text{ FT} \\
\text{DTW} & = 6.29 \text{ FT} \\
\text{DTW} & = 45.15 \text{ FT} \\
\text{DTS} & = 6.29 \text{ FT} \\
\end{align*}\]

\[\begin{align*}
\text{DTW} & = 6.29 \text{ FT} \\
\text{DTW} & = 45.15 \text{ FT} \\
\end{align*}\]

### NOTES:

- **Time Test Start**: 9:19
- **Transducer Reading at test start**: 38.856 FT
- **Time of Pressurization**: 9:19
- **Time of Equilibrium**: 9:32
- **Equilibrium Transducer Reading**: 38.879 FT
- **Time of Pressure Release**: 9:33
- **Time Test Stop**: 10:04
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA ENGINEER
Angela Hough
Sara Covelli

WELL ID: MW - 57 - 45

GROUND SURFACE EL. (FT): 14.98
DATE: 12/26/06
WELL DEPTH (FT): 45.5

WELL DEPTH (FT): 45.5
WELL DIAMETER: 1 INCH
GROUND WATER DEPTH: 6.33 FT

NO. OF WELLS IN CLUSTER: 3
PROJECT LOCATION: Indian Point

LEGEND:

DTB = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS = DEPTH TO WELL SCREEN FROM GROUND SURFACE
DTW = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
WC = WATER COLUMN HEIGHT
CH = CHANGE IN HEAD AFTER PRESSURIZATION
AS = WATER COLUMN ABOVE SCREEN
DTW = DEPTH TO TOP OF CASING FROM GROUND SURFACE

AS = DTW + WC = WATER COLUMN ABOVE SCREEN

CH = DTW + WC = WATER LEVEL INDICATOR DEPTH

CH / 2.31 = PRESSURE APPLIED TO WELL HEAD

NOTES:

Time Test Start: 10:07
Transducer Reading at test start: 38.881 FT
Time of Pressurization: 10:07
Time of Equilibrium: 10:22
Equilibrium Transducer Reading: 38.889 FT
Time of Pressure Release: 10:24
Time Test Stop: 10:40
### Pneumatic Slug Test Log

**Client:** Entergy

**Project Location:** Indian Point

**WELL ID:** MW  - 58  - 65

**Client Information:**
- **WELL NO.** 41.0017869.01
- **TEST NO.** 1 of 2
- **FILE NO.** T-207..6-A

**GZA Engineer Information:**
- **Angela Hough**
- **Sara Covelli**

**Well Details:**
- **WELL DEPTH (FT):** 65
- **WELL DIAMETER:** 1 INCH
- **GROUND WATER DEPTH:** 7.42 FT
- **NO. OF WELLS IN CLUSTER:** 2

**Measurements Taken From:**
- **ground surface**
- **top of casing**

**Leak Test Valves:**
- **PRESSURE TRANSDUCER**
- **WATER LEVEL INDICATOR**
- **PRESSURE REGULATOR**

**Legend:**
- **DTB:** DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- **DTS:** DEPTH TO WELL SCREEN FROM GROUND SURFACE
- **DTW:** DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- **WC:** WATER COLUMN HEIGHT
- **CH:** CHANGE IN HEAD AFTER PRESSURIZATION
- **AS:** WATER COLUMN ABOVE SCREEN
- **GC:** GROUND CEMENT

---

**DTB** = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE 65.00 FT

**DTS** = DEPTH TO WELL SCREEN FROM GROUND SURFACE 50.00 FT

**DTW** = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE 7.42 FT

**WC** = WATER COLUMN HEIGHT 57.58 FT

**CH** = CHANGE IN HEAD AFTER PRESSURIZATION 32.58 FT

**AS** = WATER COLUMN ABOVE SCREEN 42.58 FT

**DTW** + TRANSDUCER DEPTH = WATER LEVEL INDICATOR DEPTH 40.00 FT

**CH** / 2.31 = PRESSURE APPLIED TO WELL HEAD 14.10 PSI

**Time Test Start:** 10:12

**Transducer Reading at test start:** 36.015 FT

**Time of Pressurization:** 10:12

**Time of Equilibrium:** 10:18

**Equilibrium Transducer Reading:** 36.592 FT

**Time of Pressure Release:** 10:19

**Time Test Stop:** 10:26

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**Notes:**

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**GZA GEOENVIRONMENTAL OF NEW YORK**

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**Entergy Indian Point Energy Center**

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**Scientist and Engineers:**
- **GZA**

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**Client WELL ID:** MW  - 58  - 65
PNEUMATIC SLUG TEST LOG

GZA GEODEVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Project Location: Indian Point

Client: GZA ENGINEER
Groundwater Depth: 7.42 ft

WELL ID: MW - 58 - 65

GZA ENGINEER: Angela Hough

Ground Casing: PVC

MEASUREMENTS TAKEN FROM:
- Top of casing
- Pressure Transducer Cable
- Leakage Test Valve
- Release Valve
- COMPRESSED AIR OR NITROGEN LINE

LEGEND:
- DTB: Depth to bottom of well from ground surface
- DTS: Depth to well screen from ground surface
- DTW: Depth to static water level from ground surface
- WC: Water column height
- CH: Change in head after pressurization
- AS: Water column above screen
- DTW + TRANSDUCER DEPTH = PRESSURE APPLIED TO WELL HEAD

NOTES:

- Time Test Start: 10:26
- Time Test Stop: 10:42
- Time of Pressure Release: 10:33
- Time of Equilibrium: 10:32
- Equilibrium Transducer Reading: 36.632 ft
False start occurred at 14:28. Upon pressurization, a leak was detected. The well head was depressurized and the leak was resolved. Pressurization for actual test began at 14:30.
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA ENGINEER
Angela Hough
Rick Ponti
Sara Covelli

MEASUREMENTS TAKEN FROM:
- GROUND SURFACE
- TOP OF CASING
- WATER LEVEL
- LEAK TEST VALVE
- RELEASE VALVE
- COMPRESSED AIR OR NITROGEN LINE

PRESSURE TRANSDUCER CABLE
WATER LEVEL INDICATOR CABLE
LEAK TEST VALVE
RELEASE VALVE

LEGEND:
- DTB = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- DTS = DEPTH TO WELL SCREEN FROM GROUND SURFACE
- DTW = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- WC = WATER COLUMN HEIGHT
- CH = CHANGE IN HEAD AFTER PRESSURIZATION
- AS = WATER COLUMN ABOVE SCREEN
- DTS = DEPTH TO WATER LEVEL INDICATOR FROM GROUND SURFACE
- DTW = DEPTH TO PRESSURIZED WATER LEVEL FROM GROUND SURFACE

DTB = 31.00 FT
DTS = 21.00 FT
DTW = 11.64 FT
WC = 19.36 FT
CH = 6.36 FT
AS = 9.36 FT

CH / 2.31 = 2.75 PSI = PRESSURE APPLIED TO WELL HEAD

DTS = 14:34
Transducer Reading at test start = 7.504 FT
Time of Pressurization = 14:34
Time of Equilibrium = 14:35
Equilibrium Transducer Reading = 7.527 FT

Notes:

GZA
# Pneumatic Slug Test Log

GZA GEODENVIRONMENTAL OF NEW YORK

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

GZA ENGINEER: Angela Hough

- BORING COORDINATES: N 462912.1268 E 146429.1342
- Datum: NGVD 29
- Top of casing EL (ft): 14.52
- Date: 12/21/06
- Ground water depth: 10.58 ft
- Well depth (ft): 45
- Project location: Indian Point

**Legend:**
- DTB: Depth to bottom of well from ground surface
- DTS: Depth to well screen from ground surface
- DTW: Depth to static water level from ground surface
- WC: Water column height
- CH: Change in head after pressurization
- AS: Water column above screen

**Measurements:**

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTB</td>
<td>45.00</td>
</tr>
<tr>
<td>DTS</td>
<td>40.00</td>
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<tr>
<td>DTW</td>
<td>10.58</td>
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<tr>
<td>WC</td>
<td>34.42</td>
</tr>
<tr>
<td>CH</td>
<td>27.42</td>
</tr>
<tr>
<td>AS</td>
<td>29.42</td>
</tr>
<tr>
<td>DTS + DTW</td>
<td>31.00</td>
</tr>
<tr>
<td>WC - DTW</td>
<td>23.92</td>
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<tr>
<td>WC / 2.31</td>
<td>11.87</td>
</tr>
<tr>
<td>CH + DTW</td>
<td>38.00</td>
</tr>
</tbody>
</table>

**Pressure Calculations:**

- Pressure applied to well head: 11.87 psi

**Time Test:**

- Time Start: 11:21
- Transducer Reading at start: 23.86 ft
- Time of Pressurization: 11:21
- Time of Equilibrium: 11:26
- Equilibrium Transducer Reading: NA ft
- Time of Pressure Release: 11:26
- Time Test Stop: 11:36
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

GZA ENGINEER Angela Hough
GZA ENGINEER Rick Ponti

Client ENTERTY
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

FILE NO. 41.0017869.01
PROJECT LOCATION Indian Point

WELL ID MW - 59 - 45
TEST NO. 2 of 4

462912 1268 E 654320 1342
GZSVG 29

WELL DEPTH (FT) 45
WELL DIAMETER 1 INCH
GROUND WATER DEPTH 10.58 FT
WEAL DEPTH (FT) 45
NO. OF WELLS IN CLUSTER 3
GROUNDS WATER DEPTH (STATIC WATER LEVEL DEPTH)

MEASUREMENTS TAKEN FROM:
- ground surface
- top of casing
- leak test valve
- release valve
- compressed air or nitrogen line
- air in
- air out
- water level indicator cable
- pressure transducer cable
- pressure gauge
- pressure regulator
- pressure gauge
- pressure transducer
- data logging
- screen
- water out during pressurization
- water level indicator
- pressurized water level
- static water level
- water out during pressurization
- pressure applied to well head

LEGEND:
- DTB: Depth to bottom of well from ground surface 45.00 FT
- DTS: Depth to well screen from ground surface 40.00 FT
- DTW: Depth to static water level from ground surface 10.58 FT
- WC: Water column height 34.42 FT
- CH: Change in head after pressurization 27.42 FT
- AS: Water column above screen 29.42 FT

DTB = DTS + DTW = WC
DTS = DTS + DTW = AS
AS = WC + SAFE MARGIN = CH

CH / 2.31 = PSI

DTW + TRANSDUCER READING = 23.696 FT
TRANSDUCER DEPTH = 34.28 FT

Time Test Start 11:36
Transducer Reading at test start 23.688 FT
Time of Pressurization 11:36
Time of Equilibrium 11:44
Equilibrium Transducer Reading 23.672 FT

Time of Pressure Release 11:44
Time Test Stop 11:48

NOTES:

GZA
GZA GEONVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 16TH FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

GZA ENGINEER Angela Hough
BORING COORDINATES N 462912.1268 E 604329.1342
GROUND SURFACE EL.(FT) 14.52 DATUM NGVD 29
TOP OF CASING EL.(FT) 13.90 DATE 12/21/06
WELL DEPTH (FT) 46

WELL DIAMETER 1 INCH GROUND WATER DEPTH 10.58 FT
NO. OF WELLS IN CLUSTER 3 (STATIC WATER LEVEL DEPTH)
MEASUREMENTS TAKEN FROM: PRESSURE TRANSDUCER CABLE
 ground surface
 top of casing
WATER LEVEL INDICATOR CABLE
LEAK TEST VALVE
RELEASE VALVE
COMPRESSED AIR
OR NITROGEN LINE

GROUND SURFACE
WELL CASING / PVC

LEGEND:
DTB
DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE

DTS
DEPTH TO WELL SCREEN FROM GROUND SURFACE

DTW
DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE

WC
WATER COLUMN HEIGHT

CH
CHANGE IN HEAD AFTER PRESSURIZATION

AS
WATER COLUMN ABOVE SCREEN

DTB FT = DTS FT - DTW FT = WC FT

DTB FT = DTW FT + TRANSDUCER READING FT
TRANSDUCER DEPTH FT

CH FT = WATER LEVEL INDICATOR DEPTH FT

CH FT / 2.31 = PSI DATALOGGING
PRESSURE APPLIED TO WELL HEAD

CH FT = DTB FT + TRANSDUCER READING FT

CH FT = DTS FT + TRANSDUCER READING FT

CH FT = TIME TEST START FT

CH FT = TIME OF PRESSURIZATION FT

CH FT = TIME OF EQUILIBRIUM FT

CH FT = EQUILIBRIUM TRANSDUCER READING FT

NOTES:
False start (pressurization) at 11:48. Pressure released at 11:49 and restarted.
PNEUMATIC SLUG TEST LOG

GZA GEODENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Test No.: 4 of 4
File No.: 41.0017869.01
Project Location: Indian Point

WELL ID: MW - 59 - 45

GZA ENGINEER: Angela Hough
GZA ENGINEER: Rick Ponti

Boring Coordinates: N 462912.1268 E 604329.1342
Datum: IPEC

Well Diameter: 1 inch
Ground Water Depth: 10.58 ft

No. of Wells in Cluster: 3

Project Location: Indian Point

Well Depth (ft): 45

Measurements Taken From:
- Ground surface
- Top of casing

Legend:
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen

DTB = DTS - DTW
WC = DTB - DTW

CH = DTW + TRANSDUCER READING

DTW = 10.58 ft

Equilibrium Transducer Reading: 24.207 ft

Time Test Start: 11:56
Time Test Stop: 12:04

Time of Pressurization: 11:56
Time of Equilibrium: 12:00

Pressurized Water Level: 9.71 psi

Pressure Gauge
Pressure Regulator
Compressed Air or Nitrogen Line

Notes:
- Water Level Indicator
- Data Logging
- Screen
- Water Out During Pressurization
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA ENGINEER Angela Hough
GZA ENGINEER Rick Ponti
GZA ENGINEER

CLIENT WELL ID MW - 59 - 68
PROJECT LOCATION Indian Point

MEASUREMENTS TAKEN FROM:

- Ground surface
- Top of casing
- Pressure Transducer Cable
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line
- Air In
- Air Out

LEGEND:

- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen

DTB = DTS + DTW
WC = DTW + CH
AS = DTW + CH

DTW = Pressure Applied to Well Head

DTW = Transducer Reading + Transducer Depth

Time Test Start: 13:48
Transducer Reading at test start: 44.525 FT
Time of Pressurization: 13:48
Time of Equilibrium: 14:00
Equilibrium Transducer Reading: 45.120 FT

Time of Pressure Release: 14:00
Time Test Stop: 14:15

NOTES:

- GZA
WELL ID MW - 59 - 68

- Entergy
- Indian Point Energy Center

- 68.00 FT
- 53.00 FT
- 10.99 FT
- 57.01 FT
- 41.01 FT

- CH / 2.31 = 17.75 PSI

- WATER OUT DURING PRESSURIZATION
- DATALOGGING

- PRESSURIZED WATER LEVEL
- STATIC WATER LEVEL

- WATER LEVEL INDICATOR
- PRESSURE TRANSUCER
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 46°30'07" 4034 E 6°34'49" 9123

PROJECT LOCATION: Indian Point

WELL ID: MW - 62 - 38
TEST NO.: 1 of 1
FILE NO.: 41.0017869.10

GROUND SURFACE EL. (FT): 14.69
DATE: 5/16/07
DATUM: NGVD 29

GZA ENGINEER
GROUND WATER DEPTH: 13.51 FT
WELL DEPTH: 38.30 FT
WELL DIAMETER: 1 INCH
NO. OF WELLS IN CLUSTER: 2 + Breakout

WATER LEVEL INDICATOR CABLE
PRESSURE TRANSDUCER CABLE
LEAK TEST VALVE
RELEASE VALVE
COMPRSSED AIR OR NITROGEN LINE

GROUND SURFACE
WELL CASING / PVC

LEGEND:
DTB = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE 38.30 FT
DTS = DEPTH TO WELL SCREEN FROM GROUND SURFACE 33.30 FT
DTW = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE 13.51 FT
WC = WATER COLUMN HEIGHT 24.79 FT
CH = CHANGE IN HEAD AFTER PRESSURIZATION 10.00 FT
AS = WATER COLUMN ABOVE SCREEN 19.79 FT
CH / 2.31 = PSI
DTW** = PRESSURE APPLIED TO WELL HEAD

= WATER LEVEL INDICATOR DEPTH 23.51 FT
= TRANSDUCER READING 24.641 FT
= TRANSDUCER DEPTH 38.15 FT
= PRESSURE REGULATOR

Time Test Start: 9:00
Transducer Reading at test start: 24.668 FT
Time of Pressurization: 9.00
Equilibrium Transducer Reading: 24.694 FT
Time of Equilibrium: 9.05
Time Test Stop: 9.08

NOTES:

GZA
WELL ID: MW - 62 - 38

Entergy Indian Point Energy Center
**PNEUMATIC SLUG TEST LOG**

**GZA GEOSTRUCTURAL OF NEW YORK**

**440 NINTH AVENUE, 18TH FLOOR**
**NEW YORK, NEW YORK 10001**

**GZA ENGINEER** Angela Hough

**BORING COORDINATES**
N 463087.4034 E 604349.9123

**GZA ENGINEER**
**GROUND SURFACE EL (FT)** 14.69
**DATE** 6/16/07

**GZA ENGINEER**
**TOP OF CASING EL (FT)** 12.89
**WELL DEPTH (FT)** 38.30

**PROJECT LOCATION** Indian Point

**MEASUREMENTS TAKEN FROM**:
- Pressure Transducer Cable
- Ground Surface
- Top of Casing
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line

**WELL DEPTH (FT)** 38.30
**WELL DIAMETER** 1 inch

**GROUND SURFACE WELL CASING / PVC**

**LEGEND:**
- **DTB** = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- **DTS** = DEPTH TO WELL SCREEN FROM GROUND SURFACE
- **DTW** = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- **WC** = WATER COLUMN HEIGHT
- **CH** = CHANGE IN HEAD AFTER PRESSURIZATION
- **AS** = WATER COLUMN ABOVE SCREEN
- **CH** = SAFE MARGIN
- **WATER OUT DURING PRESSURIZATION**
- **PRESSURE APPLIED TO WELL HEAD**
- **PRESSURIZED WATER LEVEL**
- **PRESSURE TRANSDUCER**
- **PRESSURE GAUGE**
- **PRESSURE REGULATOR**
- **DATALOGGING**
- **SCREEN**
- **WATER LEVEL INDICATOR**

**NOTES:**

**GZA**

**WELL ID** MW - 62 - 38

**Entergy**

**Indian Point Energy Center**

**Client** WELD MW 62 38

**TEST NO.** 1

**FILE NO.** 41.0017869.10

**PROJECT LOCATION** Indian Point
PNEUMATIC SLUG TEST LOG

GZA GEOMEMORIAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

CLIENT:

440 NINTH AVENUE, 18TH FLOOR
TEST NO. 1 of 1
NEW YORK, NEW YORK 10001

FILE NO. 41.0017869.10
PROJECT LOCATION: Indian Point

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 463087.4034 E 604349.9123
DATUM: NGVD 29
DATE: 5/16/07

WELL DEPTH (FT): 38.30
WELL DIAMETER: 1 INCH
GROUND WATER DEPTH: 13.51 FT

NO. OF WELLS IN CLUSTER: 2 + Borehole

MEASUREMENTS TAKEN FROM:
- Pressure Transducer Cable
- Water Level Indicator Cable
- Test Start
- Pressure Release
- Equilibrium

LEGEND:
- DTB: Depth to Bottom of Well from Ground Surface
- DTS: Depth to Well Screen from Ground Surface
- DTW: Depth to Static Water Level from Ground Surface
- WC: Water Column Height
- CH: Change in Head after Pressurization
- AS: Water Column Above Screen
- DTTW: Transducer Reading
- Transducer Depth

DTB = DTTW + CH
DTB = DTTW + WC
DTS = DTTW + AS

CH / 2.31 = PSI

DEPTHS:
- DTW
- DTTW
- DTS
- DTB

PRESSURES:
- Pressure Transducer
- Pressure Regulator

NOTES:
- Time Test Start
- Time Test Stop
- Time of Pressurization
- Time of Equilibrium
- Equilibrium Transducer Reading

PNEUMATIC SLUG TEST VALVE
RELEASE VALVE
PRESSURE GAUGE
PRESSURE REGULATOR
DATALOGGING
WATER LEVEL INDICATOR
**PNEUMATIC SLUG TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**SCIENTISTS AND ENGINEERS**

**GZA ENGINEER** Angela Hough

**BORING COORDINATES**

N 462969.2977
E 604251.0687

**GROUND SURFACE EL. (FT)** 14.178

**DATUM** NGVD 29

**TOP OF CASING EL. (FT)** 13.059

**DATE** 5/9/07

**WELL DEPTH (FT)** 35.00

**WELL DIAMETER** 1 INCH

**GROUND WATER DEPTH** 13.43 FT

**NO. OF WELLS IN CLUSTER** 2 + Borehole

**MEASUREMENTS TAKEN FROM:**

- **PRESSURE TRANSDUCER CABLE**
- **WATER LEVEL INDICATOR CABLE**
- **LEAK TEST VALVE**
- **RELEASE VALVE**
- **COMPRESSED AIR OR NITROGEN LINE**
- **AIR IN**
- **AIR OUT**

**GROUND SURFACE**

**WELL CASING / PVC**

**LEGEND:**

- **DTB** Depth to Bottom of Well from Ground Surface 35.00 FT
- **DTS** Depth to Well Screen from Ground Surface 30.00 FT
- **DTW** Depth to Static Water Level from Ground Surface 13.43 FT
- **WC** Water Column Height 21.57 FT
- **CH** Change in Head after Pressurization 11.57 FT
- **AS** Water Column Above Screen 16.57 FT

**FORMULAS:**

- **DTB** = **DTW** + **WC**
- **DTS** = **DTW** + **AS**
- **AS** = **SAFE MARGIN**
- **CH** = **CH** + **DTW**
- **CH / 2.31** = **PRESSURE APPLIED TO WELL HEAD**
- **DTW** = **TRANSUDER READING**
- **DTW** = **TRANSUDER DEPTH**

**TIME TEST:**

- **Time Test Start** 10:01
- **Transducer Reading at test start** 21.449 FT
- **Time of Pressurization** 10:02
- **Time of Equilibrium** 10:07
- **Equilibrium Transducer Reading** 21.487 FT
- **Time of Pressure Release** 10:07
- **Time Test Stop** 10:16

**NOTES:**

GZA

**WELL ID** MW - 63 - 35
PNEUMATIC SLUG TEST LOG

GZA GEONENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

GZA ENGINEER - Angela Hough
BORING COORDINATES - N 462969.2977  E 604251.0687

GZA ENGINEER - Sara Covelli
GROUND SURFACE EL. (FT) - 14.178
DATE - 5/9/07

GZA ENGINEER - Angela Hough
TOP OF CASING EL. (FT) - 13.059

GZA ENGINEER - Sara Covelli
WELL DEPTH (FT) - 35.00

WELL DIAMETER - 1 INCH
GROUND WATER DEPTH - 13.43 FT

NO. OF WELLS IN CLUSTER - 2
GROUND WATER DEPTH (STATIC WATER LEVEL DEPTH) - 13.43 FT

MEASUREMENTS TAKEN FROM:
- Pressure Transducer Cable
- Ground Surface
- Top of casing
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line

LEGEND:
- DTB = DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
- DTS = DEPTH TO WELL SCREEN FROM GROUND SURFACE
- DTW = DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
- WC = WATER COLUMN HEIGHT
- CH = CHANGE IN HEAD AFTER PRESSURIZATION
- AS = WATER COLUMN ABOVE SCREEN
- DTW** = TRANSDUCER DEPTH
- TRANSUDER READING = 21.488 FT
- TRANSUDER DEPTH = 34.92 FT
- TIME TEST START = 10:19
- TIME OF PRESSURIZATION = 10:19
- TIME OF EQUILIBRIUM = 10:24
- TIME TEST STOP = 10:35
- PRESSURE APPLIED TO WELL HEAD = 21.347 PSI

NOTES:

GZA
WELL ID - MW - 63 - 35
**PNEUMATIC SLUG TEST LOG**

**Client:** WELL ID MW - 65 - 80

**Client:** Entergy

**Client:** Indian Point Energy Center

**Client:** GZA GeoEnvironmental of New York

**Client:** 440 Ninth Avenue, 18th Floor

**Client:** New York, New York 10001

**Client:** Scientists and Engineers

**Client:** Indian Point

**Client:** Well No. 1 of 2

**Client:** File No. 41.0017869.01

**Client:** Project Location: Indian Point

**Client:** GZA Engineer: Angela Hough

**Client:** GZA Engineer: Sara Covelli

**Client:** Boring Coordinates: N 462490.1706 E 604850.7655

**Client:** Datum: NGVD 29

**Client:** Well Depth (FT): 80

**Client:** Ground Surface Elevation (FT): 68.841

**Client:** Date: 12/28/06

**Client:** Ground Water Depth: 35.63 FT

**Client:** No. of Wells in Cluster: 2

**Client:** Well Diameter: 1 INCH

**Client:** Ground Water Depth: 35.63 FT

**Client:** Measurements Taken From:

- Ground Surface
- Top of Casing
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line
- Air In
- Air Out
- GROUND SURFACE WELL CASING / PVC

**Client:** Legend:

- DTB: Depth to Bottom of Well From Ground Surface
- DTS: Depth to Well Screen From Ground Surface
- DTW: Depth to Static Water Level From Ground Surface
- WC: Water Column Height
- CH: Change in Head After Pressurization
- AS: Water Column Above Screen
- DTB FT - DTW FT = WC FT
- DTS FT - DTW FT = AS FT
- CH FT
- DTW FT + TRANSDUCER READING FT = PRESSURIZED WATER LEVEL FT
- DTW FT + TRANSDUCER DEPTH FT = STATIC WATER LEVEL FT
- CH / 2.31 = PSI

**Client:** Time Test Start: 10:47

**Client:** Transducer Reading at test start: 42.102 FT

**Client:** Time of Pressurization: 10:48

**Client:** Time of Equilibrium: 11:12

**Client:** Equilibrium Transducer Reading: 42.171 FT

**Client:** Time of Pressure Release: 11:12

**Client:** Time Test Stop: 11:26

**Client:** Notes:

**Client:** GZA

**Client:** WELL ID: MW - 65 - 80

**Client:** Entergy

**Client:** Indian Point Energy Center

**Client:** GZA GeoEnvironmental of New York

**Client:** 440 Ninth Avenue, 18th Floor

**Client:** New York, New York 10001

**Client:** Scientists and Engineers

**Client:** Indian Point

**Client:** Well No. 1 of 2

**Client:** File No. 41.0017869.01

**Client:** Project Location: Indian Point

**Client:** GZA Engineer: Angela Hough

**Client:** GZA Engineer: Sara Covelli

**Client:** Boring Coordinates: N 462490.1706 E 604850.7655

**Client:** Datum: NGVD 29

**Client:** Well Depth (FT): 80

**Client:** Ground Surface Elevation (FT): 68.841

**Client:** Date: 12/28/06

**Client:** Ground Water Depth: 35.63 FT

**Client:** No. of Wells in Cluster: 2

**Client:** Well Diameter: 1 INCH

**Client:** Ground Water Depth: 35.63 FT

**Client:** Measurements Taken From:

- Ground Surface
- Top of Casing
- Water Level Indicator Cable
- Leak Test Valve
- Release Valve
- Compressed Air or Nitrogen Line
- Air In
- Air Out
- GROUND SURFACE WELL CASING / PVC

**Client:** Legend:

- DTB: Depth to Bottom of Well From Ground Surface
- DTS: Depth to Well Screen From Ground Surface
- DTW: Depth to Static Water Level From Ground Surface
- WC: Water Column Height
- CH: Change in Head After Pressurization
- AS: Water Column Above Screen
- DTB FT - DTW FT = WC FT
- DTS FT - DTW FT = AS FT
- CH FT
- DTW FT + TRANSDUCER READING FT = PRESSURIZED WATER LEVEL FT
- DTW FT + TRANSDUCER DEPTH FT = STATIC WATER LEVEL FT
- CH / 2.31 = PSI

**Client:** Time Test Start: 10:47

**Client:** Transducer Reading at test start: 42.102 FT

**Client:** Time of Pressurization: 10:48

**Client:** Time of Equilibrium: 11:12

**Client:** Equilibrium Transducer Reading: 42.171 FT

**Client:** Time of Pressure Release: 11:12

**Client:** Time Test Stop: 11:26

**Client:** Notes:
PNEUMATIC SLUG TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA ENGINEER: Angela Hough
BORING COORDINATES: N 462490.1706 E 654860.7655

GZA ENGINEER: Sara Covelli
GROUND SURFACE EL. (FT): 69.72
DATE: 12/28/06

WELL ID: MW 65 80
PROJECT LOCATION: Indian Point

NO. OF WELLS IN CLUSTER: 1
GROUND WATER DEPTH: 35.63 FT

WELL DEPTH (FT): 80
WELL DIAMETER: 1 INCH

NOTE: MEASUREMENTS TAKEN FROM:
GROUND SURFACE
top of casing

LEGEND:

DTB: DEPTH TO BOTTOM OF WELL FROM GROUND SURFACE
DTS: DEPTH TO WELL SCREEN FROM GROUND SURFACE
DTW: DEPTH TO STATIC WATER LEVEL FROM GROUND SURFACE
WC: WATER COLUMN HEIGHT
CH: CHANGE IN HEAD AFTER PRESSURIZATION
AS: WATER COLUMN ABOVE SCREEN

DTB = DTS + DTW
WC = DTW + CH
AS = WC + SAFE MARGIN

CH / 2.31 = PSI = PRESSURE APPLIED TO WELL HEAD

DTW = TRANSDUCER READING + TRANSDUCER DEPTH

NOTES:

Time Test Start: 11:27
Transducer Reading at test start: 42.107 FT
Time of Pressurization: 11:27
Time of Equilibrium: 11:46
Equilibrium Transducer Reading: 42.189 FT

Time of Pressure Release: 11:46
Time Test Stop: 12:05

42.107

PNEUMATIC SLUG TEST LOG
APPENDIX I – PACKER TEST FIELD LOGS
## PACKER TEST LOG

**Client**: BORING NO./TEST NO.: MW-30 Test 1  
**CONTRACTOR**: Aquifer Drilling & Testing, Inc.  
**FOREMAN**: D. Wood  
**GZA ENG.**: S. Kline/A. Gallas  
**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH  
**I.D. OF DRILLING RODS**: 2 INCH  
**PROJECT LOCATION**: Indian Point Energy Center  
**FILE NO.**: 41.0017869.10  
**DATE START/END**: 11/22/05  
**GROUND SURFACE EL.(FT)**: 51.7  
**GROUND WATER DEPTH**: 40.55 ft below ground surface  
**TOTAL LENGTH OF TEST SECTION (FT)**: 9.6 FT  
**TOTAL LENGTH OF TOP PACKER AND ASSEMBLY**: 2.53 FT  
**TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY**: OPEN FT  
**DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE**: 52.3 FT  
**DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE**: 40.55 FT  

### PACKER TEST LOG

<table>
<thead>
<tr>
<th>TIME</th>
<th>ELAPSED TIME</th>
<th>DEPTH TO WATER</th>
<th>DRAWDOWN</th>
<th>RECOVERY RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:15</td>
<td>0.0</td>
<td>59.0</td>
<td>18.45</td>
<td>-</td>
</tr>
<tr>
<td>13:20</td>
<td>5.0</td>
<td>56.37</td>
<td>15.82</td>
<td>3.16</td>
</tr>
<tr>
<td>13:25</td>
<td>10.0</td>
<td>56.24</td>
<td>15.69</td>
<td>1.57</td>
</tr>
<tr>
<td>13:30</td>
<td>15.0</td>
<td>56.24</td>
<td>15.69</td>
<td>1.05</td>
</tr>
<tr>
<td>13:35</td>
<td>20.0</td>
<td>56.18</td>
<td>15.63</td>
<td>0.78</td>
</tr>
<tr>
<td>13:40</td>
<td>25.0</td>
<td>56.16</td>
<td>15.61</td>
<td>0.62</td>
</tr>
<tr>
<td>13:45</td>
<td>30.0</td>
<td>56.05</td>
<td>15.50</td>
<td>0.52</td>
</tr>
<tr>
<td>13:50</td>
<td>35.0</td>
<td>56.03</td>
<td>15.48</td>
<td>0.44</td>
</tr>
<tr>
<td>13:55</td>
<td>40.0</td>
<td>55.98</td>
<td>15.43</td>
<td>0.39</td>
</tr>
<tr>
<td>14:00</td>
<td>45.0</td>
<td>55.92</td>
<td>15.37</td>
<td>0.34</td>
</tr>
</tbody>
</table>

---

**LEGEND:**
- **A**: TOTAL LENGTH OF TEST SECTION (FT) = 9.6 FT  
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 2.53 FT  
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = OPEN FT  
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 52.3 FT  
- **H1**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 40.55 FT  

**I.D. OF DRILLING RODS**: 2 INCH  
**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH  
**GROUND SURFACE EL.(FT)**: 51.7  
**GROUND WATER DEPTH**: 40.55 ft below ground surface  
**TOTAL LENGTH OF TEST SECTION (FT)**: 9.6 FT  
**TOTAL LENGTH OF TOP PACKER AND ASSEMBLY**: 2.53 FT  
**TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY**: OPEN FT  
**DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE**: 52.3 FT  
**DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE**: 40.55 FT  

---

**NOTES:**

- Water flow direction: WATER FLOW DIRECTION
- Packard inflation pressure: PACKER INFLATION PRESSURE
- Nitrogen supply line: NITROGEN SUPPLY LINE
- Flow rate: FLOW RATE
- Ground surface elevation: GROUND SURFACE ELEVATION
- Ground water table: GROUND WATER TABLE
- Inflatable packers: INFLATABLE PACKERS
- Perforated pipe: PERFORATED PIPE

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client**: Entergy Indian Point Energy Center  
**Location**: Buchanan, NY  
**File No.**: 41.0017869.10  
**Date Start/End**: 11/22/05  
**Ground Surface EL.(FT)**: 51.7  
**Ground Water Depth**: 40.55 ft below ground surface  
**Total Length of Test Section (FT)**: 9.6 FT  
**Total Length of Top Packer and Assembly**: 2.53 FT  
**Total Length of Bottom Packer and Assembly**: OPEN FT  
**Distance Between Ground Surface and Top of the Test Zone**: 52.3 FT  
**Distance Between Ground Surface and Ground Water Table**: 40.55 FT
# PACKER TEST LOG

<table>
<thead>
<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ Min)</th>
<th>Depth to Water (FT)</th>
<th>Drawdown (Δ FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48.2 to 53.0</td>
<td>14:55</td>
<td>0.0</td>
<td></td>
<td>Pump on</td>
<td></td>
</tr>
<tr>
<td>L = 4.8 ft</td>
<td>14:56</td>
<td>1.0</td>
<td></td>
<td>Pump off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>14:57</td>
<td>2.0</td>
<td>52.81</td>
<td>14.64</td>
<td>7.32</td>
</tr>
<tr>
<td></td>
<td>14:58</td>
<td>3.0</td>
<td>52.57</td>
<td>14.40</td>
<td>4.80</td>
</tr>
<tr>
<td></td>
<td>15:00</td>
<td>5.0</td>
<td>52.32</td>
<td>14.15</td>
<td>2.83</td>
</tr>
<tr>
<td></td>
<td>15:08</td>
<td>13.0</td>
<td>52.28</td>
<td>14.11</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>15:13</td>
<td>18.0</td>
<td>52.32</td>
<td>14.15</td>
<td>0.79</td>
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<td></td>
<td>15:18</td>
<td>23.0</td>
<td>52.28</td>
<td>14.11</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>15:25</td>
<td>30.0</td>
<td>52.31</td>
<td>14.14</td>
<td>0.47</td>
</tr>
</tbody>
</table>

**Legend:**
- **A**: Total Length of Test Section (FT) = 4.8 ft
- **BP**: Total Length of Bottom Packers and Assembly = 2.45 ft
- **TP**: Total Length of Top Packers and Assembly = 2.53 ft
- **D**: Distance Between Ground Surface and Bottom of Test Zone = 48.2 ft
- **H1**: Distance Between Ground Surface and Ground Water Table = 38.17 ft
### PACKER TEST LOG

#### GZA GEODENVIRONMENTAL OF NEW YORK

440 Ninth Avenue, 18th Floor  
New York, New York 10001  
Scientists and Engineers

#### Client

Entergy  
Indian Point Energy Center  
Buchanan, NY

#### Boring No./Test No.

MW-30 Test 3

#### Boring Coordinates

N 463012.3771  
E 604885.1439

#### Ground Surface EL.(FT)

51.7  
Datum NGVD 29

#### Final Boring Depth (FT)

61.7  
Date Start/End 11/22/05

#### Diameter of Drilled Borehole

3.83 inch

#### Ground Water Depth

39.97 feet below ground surface

#### I.D. of Drilling Rods

2 inch

#### Foreman

D. Wood

#### GZA Eng.

S. Kline/A. Gallas

#### Table: TIME ELAPSED DEPTH TO DRAWDOWN RECOVERY

<table>
<thead>
<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ MIN)</th>
<th>Depth to Water (FT)</th>
<th>Drawdown (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0 to 49.8</td>
<td>15:44</td>
<td>0.0</td>
<td>49.85</td>
<td>9.88</td>
<td>9.88</td>
</tr>
<tr>
<td>L = 4.8 ft</td>
<td>15:45</td>
<td>1.0</td>
<td>45.3</td>
<td>5.33</td>
<td>1.78</td>
</tr>
<tr>
<td></td>
<td>15:47</td>
<td>3.0</td>
<td>42.8</td>
<td>2.83</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>15:50</td>
<td>6.0</td>
<td>42.14</td>
<td>2.17</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>16:00</td>
<td>16.0</td>
<td>41.53</td>
<td>1.56</td>
<td>0.10</td>
</tr>
</tbody>
</table>

Sample collected at 16:04

#### Diagram

- **A**: Total Length of Test Section (FT)  
  - 4.8 FT
- **TP**: Total Length of Top Pack and Assembly  
  - 2.53 FT
- **BP**: Total Length of Bottom Pack and Assembly  
  - 2.45 FT
- **D**: Distance Between Ground Surface and Top of the Test Zone  
  - 45.0 FT
- **H1**: Distance Between Ground Surface and Ground Water Table  
  - 39.97 FT

#### Legend

- **GZA**: 5.5 Gallons Purge
### PACKER TEST LOG

**GZA GEORESOURCE MANAGEMENT OF NEW YORK**

**Client:** Entergy

**Indian Point Energy Center, Buchanan, NY**

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** D. Wood

**GZA ENG.:** S. Kline/A. Gallas

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**I.D. OF DRILLING RODS:** 2 INCH

---

**BOARING NO./TEST NO.:** MW-30 Test 4

**GROUND COORDINATES:** N 463012.3771 E 604885.1439

**GROUND SURFACE EL.(FT):** 51.7

**FINAL BORING DEPTH (FT):** 61.7

**DATE START/END:** 11/22/05

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 39.98 ft below ground surface

---

**TIME** | **DISTANCE** | **WATER RATE** | **WATER FLOW DIRECTION** |
---|---|---|---|
16:28 | 0 | 48.24 | 8.26 |
16:29 | 1.0 | 47.35 | 7.37 |
16:30 | 2.0 | 45.65 | 5.67 |
16:32 | 4.0 | 44.93 | 4.95 |
16:35 | 7.0 | 44.27 | 4.29 |
16:40 | 12.0 | 43.52 | 3.54 |

**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND BOTTOM OF THE TEST ZONE
- **H1** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

5.5 Gallons Purge = 0.598 gal per ft
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
D. Wood

**GZA ENG.**
P. Mahon

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**I.D. OF DRILLING RODS**
2 INCH

**BORING NO./TEST NO.**
MW-31 Test 1

**PROJECT LOCATION**
Indian Point Energy Center

---

<table>
<thead>
<tr>
<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME (Δ MIN)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAW DOWN ( ΔH FT)</th>
<th>RECOVERY RATE (ΔH/Δt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>79.9-90.0</td>
<td>11:19</td>
<td>-</td>
<td>32.2</td>
<td>0.00</td>
</tr>
<tr>
<td>L= 10.1 ft</td>
<td>11:34</td>
<td>0</td>
<td>69.2</td>
<td>37.00</td>
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<tr>
<td></td>
<td>11:44</td>
<td>10</td>
<td>49.0</td>
<td>16.80</td>
</tr>
<tr>
<td></td>
<td>11:54</td>
<td>20</td>
<td>39.6</td>
<td>7.40</td>
</tr>
<tr>
<td></td>
<td>12:04</td>
<td>30</td>
<td>35.2</td>
<td>3.00</td>
</tr>
<tr>
<td></td>
<td>12:14</td>
<td>40</td>
<td>33.9</td>
<td>1.70</td>
</tr>
<tr>
<td></td>
<td>12:24</td>
<td>50</td>
<td>33.5</td>
<td>1.30</td>
</tr>
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<td></td>
<td>12:34</td>
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</tr>
<tr>
<td></td>
<td>12:44</td>
<td>70</td>
<td>33.4</td>
<td>1.20</td>
</tr>
<tr>
<td></td>
<td>12:54</td>
<td>80</td>
<td>33.3</td>
<td>1.10</td>
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<tr>
<td></td>
<td>13:02</td>
<td>88</td>
<td>33.3</td>
<td>1.10</td>
</tr>
</tbody>
</table>

**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT) = 10.1 FT
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 2.5 FT
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = NA FT
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 79.9 FT
- **PIP** - PACKER INFLATION PRESSURE = 140 PSI
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE = 87.9 FT
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 32.2 FT
### PACKER TEST LOG

**Client:** Entergy
**Location:** Indian Point Energy Center, Buchanan, NY
**Contractor:** Aquifer Drilling & Testing, Inc.
**Boring No./Test No.:** MW-31 Test 2

**Details:**
- **Boring Coordinates:** N 462969.8368 E 604924.2169
- **Ground Surface EL. (FT):** 79.793
- **Datum:** NGVD 29
- **Final Boring Depth (FT):** 90
- **Date Start/End:** 1/17/06
- **Diameter of Drilled Borehole:** 3.83 INCH
- **I.D. of Drilling Rods:** 2 INCH
- **Ground Water Depth:** 33.0 ft below ground surface

#### Tested Interval

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time</th>
<th>Depth to Water</th>
<th>Draw Down</th>
<th>Recovery Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.4-82.0</td>
<td></td>
<td>33.0</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>14:42</td>
<td>0</td>
<td>52.7</td>
<td>19.70</td>
<td>0.46</td>
</tr>
<tr>
<td>14:58</td>
<td>10</td>
<td>37.6</td>
<td>4.60</td>
<td>0.11</td>
</tr>
<tr>
<td>15:08</td>
<td>20</td>
<td>35.2</td>
<td>2.20</td>
<td>0.06</td>
</tr>
<tr>
<td>15:16</td>
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</tr>
<tr>
<td>15:18</td>
<td>30</td>
<td>34.6</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>15:20</td>
<td>32</td>
<td>34.4</td>
<td>1.40</td>
<td></td>
</tr>
<tr>
<td>15:22</td>
<td>34</td>
<td>34.2</td>
<td>1.20</td>
<td></td>
</tr>
<tr>
<td>15:24</td>
<td>36</td>
<td>34.0</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>15:26</td>
<td>38</td>
<td>33.8</td>
<td>0.80</td>
<td></td>
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<tr>
<td>15:28</td>
<td>40</td>
<td>33.6</td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>15:30</td>
<td>42</td>
<td>33.4</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>15:32</td>
<td>44</td>
<td>33.2</td>
<td>0.20</td>
<td></td>
</tr>
<tr>
<td>15:34</td>
<td>46</td>
<td>33.0</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance between Ground Surface and Top of the Test Zone
- **PIP:** Packers Inflation Pressure
- **H1:** Distance between Water Pressure Gauge and Ground Surface
- **H2:** Distance between Ground Surface and Ground Water Table

**Values:**
- **A:** 8.6 FT
- **TP:** 2.5 FT
- **BP:** 4.2 FT
- **D:** 73.4 FT
- **PIP:** 200 PSI
- **H1:** 81.2 FT
- **H2:** 33.0 FT
## PACKER TEST LOG

### Client Details
- **Client:** Entergy
- **Location:** Indian Point Energy Center, Buchanan, NY
- **File No.:** 41.0017869.10

### Project Details
- **Contractor:** Aquifer Drilling & Testing, Inc.
- **Location:** Indian Point Energy Center
- **Boring No./Test No.:** MW-31 Test 3
- **Final Boring Depth:** 90 ft
- **Groundwater Depth:** 32.7 ft below ground surface (Static Water Level Depth)

### Drilling Details
- **Boring Coordinates:**
  - N: 462969.8368
  - E: 604924.2169
- **Ground Surface El. (FT):** 79.793 ft
- **Datum:** NGVD 29
- **Date Start/End:** 1/18/06
- **Diameter of Drilled Borehole:** 3.83 inch
- **I.D. of Drilling Rods:** 2 inch

### Log Details

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>65.4-74.0</td>
<td>9:09</td>
<td>-</td>
<td>32.7</td>
<td>0.00</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L= 8.6 ft</td>
<td>9:19</td>
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<td>59.9</td>
<td>27.20</td>
<td>-</td>
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<td></td>
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</tr>
<tr>
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<td>9:29</td>
<td>10.0</td>
<td>43.8</td>
<td>11.10</td>
<td>1.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>9:39</td>
<td>20.0</td>
<td>37.0</td>
<td>4.30</td>
<td>0.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>9:49</td>
<td>30.0</td>
<td>34.1</td>
<td>1.40</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9:58</td>
<td>39.0</td>
<td>33.6</td>
<td>0.90</td>
<td>0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Legend
- **A:** Total Length of Test Section (FT) = 8.6 FT
- **TP:** Total Length of Top Packer and Assembly = 2.5 FT
- **BP:** Total Length of Bottom Packer and Assembly = 4.2 FT
- **D:** Distance Between Ground Surface and Top of the Test Zone = 65.4 FT
- **PIP:** Packer Inflation Pressure = 160 PSI
- **H1:** Distance Between Water Pressure Gauge and Ground Surface = 74 FT
- **H2:** Distance Between Ground Surface and Ground Water Table = 32.7 FT
### PACKER TEST LOG

**Client:** Entergy  
**Address:** Indian Point Energy Center, Buchanan, NY  
**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** D. Wood  
**GZA Eng.:** P. Mahon  
**File No.:** 41.0017869.10  
**Location:** Indian Point Energy Center  

**Boring No./Test No.:** MW-31 Test 4  
**Sheet:** 1 of 1  

**Coordinates:**  
- BORING NO. /TEST NO.: MW-31 Test 4  
- FILE NO.: 41.0017869.10  
- PROJECT LOCATION: Indian Point Energy Center  

**Boring Details:**  
- Diameter of Drilled Borehole: 3.83 inch  
- Ground Water Depth: 32.6 ft below ground surface  
- Ground Surface EL (FT): 79.793 DATUM NGVD 29  
- Final Boring Depth (FT): 90  
- Date Start/End: 1/18/06  
- Ground Water Depth: 32.6 ft below ground surface

**Legend:**  
- **A:** Total length of test section (ft)  
- **TP:** Total length of top packer and assembly  
- **BP:** Total length of bottom packer and assembly  
- **D:** Distance between ground surface and top of the test zone  
- **PIP:** Packer inflation pressure  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table

**Tested Interval Log:**

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<tr>
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<th>Time (HR:MIN:SEC)</th>
<th>Depth to Water (FT)</th>
<th>Draw Down (ΔH FT)</th>
<th>Recovery Rate (ΔH/ΔT)</th>
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</thead>
<tbody>
<tr>
<td>58.4-67.0</td>
<td>10:40</td>
<td>32.6</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>L= 8.6 ft</td>
<td>10:52</td>
<td>62.4</td>
<td>29.80</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>11:26</td>
<td>1.8</td>
<td>-30.80</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>11:34</td>
<td>0.0</td>
<td>49.0</td>
<td>16.40</td>
</tr>
<tr>
<td></td>
<td>11:44</td>
<td>10.0</td>
<td>38.0</td>
<td>5.40</td>
</tr>
<tr>
<td></td>
<td>11:52</td>
<td>18.0</td>
<td>34.6</td>
<td>2.00</td>
</tr>
</tbody>
</table>

**Flow Rate:**

- **From:** 58.4-67.0 ft  
- **To:** 8.6 ft  
- **Flow Rate:** 0.11 ft/sec

**Diagram:**  
- **Packer Inflation Pressure:**
- **Flow Rate:**
- **Nitrogen Supply Line:**
- **Ground Surface Elevation:**
- **Water Flow Direction:**
- **Inflatable Packers:**
- **Perforated Pipe:**  
  - **A:** Top packer and assembly  
  - **D:** Length of test section  
  - **H1:** Distance between gauge and ground surface  
  - **H2:** Distance between ground surface and ground water table

**GZA GEOENVIRONMENTAL OF NEW YORK**

**GZA GEOENVIRONMENTAL OF NEW YORK**
## PACKER TEST LOG

**Client:** Entergy
**Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** D. Wood
**Engineer:** P. Mahon

<table>
<thead>
<tr>
<th>Tested Interval</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δt MIN)</th>
<th>Depth to Water (FT)</th>
<th>Draw Down (Δh FT)</th>
<th>Recovery Rate (Δh/Δt)</th>
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</thead>
<tbody>
<tr>
<td>50.9-59.5</td>
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<td>-</td>
<td>33.0</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>L = 8.6 ft</td>
<td>12:20</td>
<td>0.0</td>
<td>40.2</td>
<td>7.20</td>
<td>-</td>
</tr>
<tr>
<td>L = 8.6 ft</td>
<td>12:30</td>
<td>10.0</td>
<td>33.2</td>
<td>0.20</td>
<td>0.02</td>
</tr>
<tr>
<td>L = 8.6 ft</td>
<td>12:40</td>
<td>20.0</td>
<td>33.2</td>
<td>0.20</td>
<td>0.01</td>
</tr>
</tbody>
</table>

**Legend:**
- **A:** Total length of test section (FT) = 8.6 FT
- **TP:** Total length of top packer and assembly = 2.5 FT
- **BP:** Total length of bottom packer and assembly = 4.2 FT
- **H1:** Distance between water pressure gauge and ground surface = 50.9 FT
- **H2:** Distance between ground surface and ground water table = 59.5 FT
- **H3:** Distance between water pressure gauge and ground surface = 33 FT

**Boiling Coordinates:**
- **N:** 462969.8368
- **E:** 604924.2169
- **Datum:** NGVD 29

**Ground Surface EL. (FT):** 79.793

**Final Boring Depth (FT):** 90

**Ground Water Depth:** 33.0 ft below ground surface

**I.D. of Drilling Rods:** 2 INCH

**Diameter of Drilled Borehole:** 3.83 INCH

**Ground Surface Elevation:**
- 50.9-59.5
- 12:08 - 33.0
- 12:20 - 40.2
- 12:30 - 33.2
- 12:40 - 33.2

**Water Flow Direction:**
- **GWT**
- **H1**
- **H2**

**Perforated Pipe:**
- **TP**
- **A**

**Inflatable Packers:**
- **P**

**Packers Inflation Pressure:**
- **PIP**
- **160 PSI**

**Nitrogen Supply Line:**
- **Q**
- **H1**

**Flow Rate:**

---

**GZA GEOENVIROMENTAL OF NEW YORK**

440 Ninth Avenue, 18th Floor
New York, New York 10001

Scientists and Engineers

**DATE START/END:** 1/18/06

**FILE NO.:** 41.0017869.10

---

**GZA ENG.**

P. Mahon

---

**Borings Coordinates:**

- **N:** 462969.8368
- **E:** 604924.2169

---

**File No.:** 41.0017869.10
**GZA GEORESOURCESTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Client**  
Enery  
Indian Point Energy Center  
Buchanan, NY  

**GZA GEORESOURCESTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Contractor**  
Aquifer Drilling & Testing, Inc.  

**Foreman**  
D. Wood  

**GZA ENG.**  
P. Mahon  

**Boring No./Test No.:**  
MW-31  Test 6  

**File No.:**  
41.0017869.10  

**Project Location:**  
Indian Point Energy Center  

**File No.**  
462969.8368  

**Coordinates:**  
<table>
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<tr>
<th>N</th>
<th>E</th>
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</thead>
<tbody>
<tr>
<td>79.793</td>
<td>604524.2169</td>
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</tbody>
</table>

**Date Start/End:**  
1/18/06  

**Ground Surface El. (FT):**  
79.793  

**Datum:**  
NGVD 29  

**Final Boring Depth (FT):**  
90  

**Drilled Borehole Diameter (IN):**  
3.83  

**Ground Water Depth:**  
33.4 ft below ground surface  

**Static Water Level Depth:**  
33.4 ft below ground surface  

**I.D. of Drilling Rods:**  
2 inch  

**Legend:**  

| Symbol | Description | Value  
|---|---|---|  
| A | Total Length of Test Section (FT) | 8.6 FT  
| TP | Total Length of Top Packers and Assembly | 2.5 FT  
| BP | Total Length of Bottom Packers and Assembly | 4.2 FT  
| D | Distance Between Ground Surface and Top of the Test Zone | 42.9 FT  
| PIP | Packers Inflation Pressure | 160 PSI  
| H1 | Distance Between Water Pressure Gauge and Ground Surface | 51.5 FT  
| H2 | Distance Between Ground Surface and Ground Water Table | 33.4 FT  

*A short duration constant head test was performed at this interval with a flow rate of 1.3 gpm and drawdown of 0.7 ft.*
### PACKER TEST LOG

**Client:** Entergy  
**Project Location:** Indian Point Energy Center, Buchanan, NY  
**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** D. Wood  
**GZA Eng.:** P. Mahon  
**Boring No./Test No.:** MW-31  Test 7  
**File No.:** 41.0017869.10

#### Boring Coordinates
- **North:** 462969.8368  
- **East:** 604924.2169  
- **Datum:** NGVD 29  
- **Ground Surface Elev.:** 79.793 ft

#### Ground Water Depth
- **(Static Water Level Depth):** 32.6 ft below ground surface

#### Diameter of Drilled Borehole
- 3.83 inch

#### I.D. of Drilling Rods
- 2 inch

#### Packers and Inflation Pressure
- **Inflatable Packers:**  
- **Perforated Pipe:**

#### Test Log

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<tr>
<th>Time Interval</th>
<th>Time Elapsed</th>
<th>Depth to Water</th>
<th>Draw Down</th>
<th>Recovery Rate</th>
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<td>32.6</td>
<td>0.00</td>
</tr>
<tr>
<td>L = 8.6 ft</td>
<td>14:29</td>
<td>10.0</td>
<td>42.2</td>
<td>9.60</td>
</tr>
<tr>
<td></td>
<td>14:39</td>
<td>20.0</td>
<td>38.8</td>
<td>6.20</td>
</tr>
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<td></td>
<td>14:49</td>
<td>30.0</td>
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<tr>
<td></td>
<td>15:09</td>
<td>40.0</td>
<td>34.1</td>
<td>1.50</td>
</tr>
</tbody>
</table>

#### Legend:
- **A:** Total Length of Test Section (FT)  
- **B:** Distance between Water Pressure Gauge and Ground Surface (FT)  
- **C:** Distance between Ground Surface and Ground Water Table (FT)  
- **D:** Distance between Bottom Packer and Assembly (FT)  
- **P:** Packers Inflation Pressure (PSI)  
- **Q:** Flow Rate (GPM)  
- **T:** Total Length of Top Packer and Assembly (FT)  
- **B:** Total Length of Bottom Packer and Assembly (FT)  

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 Ninth Avenue, 18th Floor**  
**New York, New York 10001**

**Scientists and Engineers**

**Entergy**

**Indian Point Energy Center, Buchanan, NY**

**Project Location:** Indian Point Energy Center
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**CLIENT**

**Boring No./Test No.** MW-32 T1

**Contractor** Aquifer Drilling & Testing, Inc.

**Foreman** Lloyd Adams

**GZA Eng.** Sara Covelli

**Client**

Entergy

Indian Point Energy Center

Buchanan, NY

**Boring Coordinates**

<table>
<thead>
<tr>
<th>N</th>
<th>198.7</th>
<th>Datum NGVD 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>78.898</td>
<td></td>
</tr>
</tbody>
</table>

**Project Location** Indian Point

**Sheet** 1 of 1

**File No.** 41.001769.01

### Test Parameters

- **Diameter of Drilled Borehole** 3.63 Inch
- **Ground Water Depth** 68.11 ft below ground surface
- **Final Boring Depth (FT)** 198.7
- **Date Start/End** 3/27/06
- **Inflatable Packers**
- **Perforated Pipe**

### Water Flow Direction

- **H1** - Distance between water pressure gauge and ground surface
- **H2** - Distance between ground surface and ground water table

### Nitrogen Supply Line

- **P** - Packers
- **Q** - Total length of test section (FT)
- **L** - Total length of top packer and assembly
- **BP** - Total length of bottom packer and assembly
- **D** - Distance between ground surface and top of the test zone
- **P&** - Packers inflation pressure (D psi + 50 psi)
- **Time** (HR:MIN:SEC)
- **Depth to Water (FT)**
- **Cumulative Recovery (ΔH FT)**
- **Recovery Rate (ΔH/Δt)**

### Test Log

<table>
<thead>
<tr>
<th>Tested Interval</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δt MIN)</th>
<th>Depth to Water (FT)</th>
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<td>68.32</td>
<td>28.35</td>
<td>1.13</td>
</tr>
</tbody>
</table>

---

**Legend:**

- **A** = Total Length of Test Section (FT)
- **TP** = Total Length of Top Packer and Assembly
- **BP** = Total Length of Bottom Packer and Assembly
- **D** = Distance between Ground Surface and Top of the Test Zone
- **P&** = Packer Inflation Pressure (D psi + 50 psi)
- **H1** = Distance between Water Pressure Gauge and Ground Surface
- **H2** = Distance between Ground Surface and Ground Water Table
- **GZA**

Boring No./Test No. MW-32 T1
### PACKER TEST LOG

**Client:** Enertgy
**Project Location:** Indian Point Energy Centre

<table>
<thead>
<tr>
<th>Client</th>
<th>PROJECT LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enertgy</td>
<td>Indian Point Energy Centre</td>
</tr>
</tbody>
</table>

#### BORING NO./TEST NO. MW-32 T2

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.
**FOREMAN:** Lloyd Adams
**GZA ENG.:** Sara Covelli
**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH
**I.D. OF DRILLING RODS:** 2 INCH

#### BORING COORDINATES

- **N:** 462,953.4787
- **E:** 604,876.0269

**GROUND SURFACE EL.(FT):** 78.898
**GROUND WATER DEPTH:** 68.11 ft below ground surface (STATIC WATER LEVEL DEPTH)

**FINAL BORING DEPTH (FT):** 198.7
**DATE START/END:** 3/27/06

#### TIME WATER DRAWDOWN RATE CAPACITY

<table>
<thead>
<tr>
<th>TIME (HR:MIN:SEC)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (ft/Min)</th>
<th>PUMPING RATE (gal/min)</th>
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<td>14:19 4</td>
<td>71.52</td>
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<td>0.714</td>
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<td>14:20 5</td>
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<td>0.714</td>
<td>0.209</td>
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**LEGEND:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **L:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 10 FT
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = 17.15 FT
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 174.4 FT
- **P:** PACKER INFLATION PRESSURE (D Psi + 50 PSI) = 185 PSI
- **H1:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 177 FT
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 68.11 FT
### PACKER TEST LOG

**Client:** Entergy Indian Point Energy Center

**Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Lloyd Adams

**GZA Eng.:** Sara Covelli

**Diameter of Drilled Borehole:** 3.83 inch

**Ground Water Depth:** 68.11 ft below ground surface

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<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ MIN)</th>
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<th>Cumulative Recovery (ΔH FT)</th>
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**Legend:**

- **A:** Total Length of Test Section (FT) = 10 FT
- **TP:** Total Length of Top Pack and Assembly = 17.15 FT
- **BP:** Total Length of Bottom Pack and Assembly = 4.05 FT
- **D:** Distance Between Ground Surface and Top of the Test Zone = 169.4 FT
- **PIP:** Pack Pressure (psi + 50 psi) = 185 psi
- **H1:** Distance Between Water Pressure Gauge and Ground Surface = 172 FT
- **H2:** Distance Between Ground Surface and Ground Water Table = 68.11 FT

---

**Packers:**

- Inflatable Packers
- Perforated Pipe

**Pipe:**

- Nitrogen Supply Line
- Flow Rate

**Diagram:**

- Ground Surface Elevation (H2)
- Water Flow Direction (H1)
- Boring Coordinates

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Scientists and Engineers:**

- Entergy
- Indian Point Energy Center
- Buchanan, NY

---

**File No.:** 41.0017869.01

**File No.:** 41.0017869.01
## PACKER TEST LOG

**Client**: Entergy Indian Point Energy Center  
**Location**: Buchanan, NY

**Contractor**: Aquifer Drilling & Testing, Inc.  
**Foreman**: Lloyd Adams  
**GZA Eng.**: Sara Covelli

**Client**: BORING NO./TEST NO. MW-32 T4  
**Sheet**: 1 of 1  
**File No.**: 41.0017869.01  
**Project Location**: Indian Point

**Boring Coordinates**  
- N: 462,953.4787  
- E: 604,976.0269  
- Datum: NGVD 29  
- Date Start/End: 3/28/06

**Drilling Details**  
- Diameter of Drilled Borehole: 3.83 INCH  
- I.D. of Drilling Rods: 2 INCH

### Test Results

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<tr>
<th>Interval From / To (FT)</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ MIN)</th>
<th>Depth to Water (FT)</th>
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**Legend**  
- **A**: Total Length of Test Section (FT)  
- **TP**: Total Length of Top Packers and Assemblies  
- **BP**: Total Length of Bottom Packers and Assemblies  
- **D**: Distance Between Ground Surface and Top of the Test Zone  
- **P**: Packers Inflation Pressure (D PSI + 50 PSI)  
- **H1**: Distance Between Water Pressure Gauge and Ground Surface  
- **H2**: Distance Between Ground Surface and Ground Water Table

**Additional Notations**  
- Nitrogen Supply Line  
- Flow Rate  
- Ground Surface Elevation  
- Water Flow Direction  
- Inflatable Packers  
- Perforated Pipe
**PACKER TEST LOG**

**GZA GEONENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CONTRACTOR** Aquifer Drilling & Testing, Inc.

**FOREMAN** Lloyd Adams

**GZA ENG.** Sara Covelli

**DIAMETER OF DRILLED BOREHOLE** 3.83

**I.D. OF DRILLING RODS** 2

---

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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**NITROGEN SUPPLY LINE**

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**GWT**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**BP**

---

**ENTERGY INDIAN POINT ENERGY CENTER**

Buchanan, NY

**PROJECT LOCATION** Indian Point

---

**SCIENTISTS AND ENGINEERS**

GZA GEOENVIRONMENTAL OF NEW YORK

**FILE NO.** 41.0017669.01

**DATE START/END** 3/29/06
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**SCIENTISTS AND ENGINEERS**

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**BORING NO./TEST NO.**
MW-32 T6

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Lloyd Adams

**GZA ENG.**
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**
3.83

**GROUND WATER DEPTH**
(STATIC WATER LEVEL DEPTH)
68.11 ft below ground surface

### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **P** - PACKER INFLATION PRESSURE (0 PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME ( Δ MIN)</th>
<th>TRANSDUCER PRESSURE HEAD (FT H2O)</th>
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GZA

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**SCIENTISTS AND ENGINEERS**

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**BORING NO./TEST NO.**
MW-32 T6

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Lloyd Adams

**GZA ENG.**
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**
3.83

**GROUND WATER DEPTH**
(STATIC WATER LEVEL DEPTH)
68.11 ft below ground surface

### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **P** - PACKER INFLATION PRESSURE (0 PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Enertgy Indian Point Energy Center

**Location:** Buchanan, NY

---

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Lloyd Adams

**GZA ENG.:** Sara Covelli

---

**DIAMETER OF DRILLED BOREHOLE:** 3.83

**GROUND WATER DEPTH:** 68.11 ft below ground surface

---

**TIME** | **ELAPSED TIME** | **TRANSUDER PRESSURE HEAD (FT H2O)** | **DEPTH TO WATER (FT)** | **CUMULATIVE RECOVERY (ΔH FT)** | **RECOVERY RATE (ΔH/ΔT)** | **NITROGEN SUPPLY LINE** | **FLOW RATE** | **GROUND SURFACE ELEVATION** | **WATER FLOW DIRECTION** | **INFLATABLE PACKERS** | **PERFORATED PIPE** | **PACKER INFLATION PRESSURE** |
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<td>TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY</td>
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**NOTE:**

- **L** = 10.0 ft
- **79.4-89.4**
- **14:07**
- **10 FT**
- **17.15 FT**
- **4.05 FT**
- **79.4 FT**
- **185 PSI**
- **82 FT**
# PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**SCIENTISTS AND ENGINEERS**

**Client**

Entergy Indian Point Energy Centre

**Borong No./Test No.**

MW-32 T8

**Site Location**

Indian Point

**Contractor**

Aquifer Drilling & Testing, Inc.

**Foreman**

Lloyd Adams

**GZA Eng.**

Sara Covelli

**Client No.**

File No. 41.0017869.01

**Project Location**

Indian Point

**Boring No./Test No.**

MW-32 T8

**Sheet**

1 of 1

**Date Start/End**

3/29/06 – 3/30/06

**Ground Water Depth**

68.11 ft below ground surface

**Static Water Level Depth**


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<th>Elapsed Time (Δt Min)</th>
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**Legend:**

- A - Total Length of Test Section (ft)
- TP - Total Length of Top packer and Assembly
- BP - Total Length of Bottom Packer and Assembly
- D - Distance between Ground Surface and Top of the Test Zone
- Pip - Packer Inflation Pressure (in PSI) + 50 PSI
- H1 - Distance between Water Pressure Gauge and Ground Surface
- H2 - Distance between Ground Surface and Ground Water Table

---

**GZA**

Borong No./test No. MW-32 T8
## PACKER TEST LOG

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**Project Location**
Indian Point

**Contractor**
Aquifer Drilling & Testing, Inc.

**Foreman**
Lloyd Adams

**GZA Eng.**
Sara Covelli

**Client BORING NO./TEST NO.**
MW-39 T1

**Boring Coordinates**
N 462425.5051  E 604676.8687

**Ground Surface EL.(FT)**
81.864

**Datum**
NGVD 29

**Final Boring Depth (FT)**
196.3

**Date Start/End**
4/05/06

**Diaphragm Diameter**
3.83 INCH

**Ground Water Depth**
57.12 FT (from ground) 0.37 FT ground to casing

**I.D. of Drilling Rods**
2 INCH

### TESTED INTERVAL

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<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ Min)</th>
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**LEGEND:**
- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packers and Assembly
- **BP**: Total Length of Bottom Backer and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Packer Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table

---

**GZA GEOSTRATEGIC OF NEW YORK**

440 Ninth Avenue, 18th Floor
New York, NY 10001

**Scientists and Engineers**

Entergy
Indian Point Energy Centre
Buchanan, NY

**Project Location**
Indian Point

**File No.**
41.0017869.01

**Diagram:**
- NITROGEN SUPPLY LINE
- PACKER INFLATION PRESSURE
- FLOW RATE
- GROUND SURFACE ELEVATION
- WATER FLOW DIRECTION
- INFLATABLE PACKERS
- PERFORATED PIPE
- TOTAL LENGTH OF TEST SECTION (FT)
- TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
- DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**

**CLIENT**

Entergy
Indian Point Energy Center
Buchanan, NY

**PROJECT LOCATION**

Indian Point

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Lloyd Adams

**GZA ENG.**

Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

---

**BOERING NO./TEST NO.**

MW-39  T2

**BORING COORDINATES**

N 462425.5051  E 604676.8687

**GROUND SURFACE EL.(FT)**

81.864

**GROUND WATER DEPTH**

57.12 FT (from ground)

**STATIC WATER LEVEL DEPTH**

0.37 FT ground to casing

---

**TIME**

13:31 0 105.366 76.43 0.00 -

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13:33 2 109.193 72.61 3.83 1.91

13:34 3 110.809 70.99 5.44 1.81

13:35 4 112.313 69.49 6.95 1.73

13:36 5 113.711 68.09 8.35 1.66

13:37 6 115.016 66.78 9.65 1.60

13:38 7 116.234 65.57 10.87 1.55

13:39 8 117.385 64.42 12.02 1.50

13:40 9 118.454 63.35 13.09 1.45

13:41 10 119.459 62.34 14.09 1.40

13:42 11 120.392 61.41 15.03 1.36

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13:45 14 122.433 60.37 17.07 1.23

13:46 15 122.884 59.92 17.52 1.19

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13:54 23 124.256 57.54 18.89 0.82

13:55 24 124.272 57.53 18.91 0.79

13:56 25 124.284 57.52 18.92 0.76

---

**LEGEND:**

A - TOTAL LENGTH OF TEST SECTION (FT)

L - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY

BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY

D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE

PWP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)

H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**NOTES:** Due to high communication between the IN ZONE and BELOW ZONE at this test interval, results for this packer test may not be valid. Three additional attempts (at depth intervals 174-184 ft, 176-186 ft, and 177-187 ft) were made to eliminate this communication. However, all three additional intervals showed the same excess communication between the IN ZONE and BELOW ZONE.

---

**GZA**

**BORING NO./TEST NO.**

MW-39  T2

---

**Table:**

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# PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Centre  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Lloyd Adams

**GZA ENG.**  
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**I.D. OF DRILLING RODS**  
2 INCH

## TESTED INTERVAL (FROM TO) (FT)

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**NITROGEN SUPPLY LINE**

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**BP - DISTANCE BETWEEN GROUND SURFACE AND BOTTOM BACKER AND ASSEMBLY**

**H1 - DISTANCE BETWEEN GROUND PRESSURE GAUGE AND GROUND SURFACE**

**H2 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND WATER TABLE**

**LEGEND:**

- **A - TOTAL LENGTH OF TEST SECTION (FT)**
- **TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY**
- **BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY**
- **D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE**
- **PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)**
- **Packing in the test section**
- **10 FT**
- **16.65 FT**
- **3.6 FT**
- **165 FT**
- **185 PSI**
- **171.8 FT**
- **57.12 FT**

**TOTAL LENGTH OF TOP PACKER AND ASSEMBLY TP = 16.65 FT**

**TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY BP = 3.6 FT**

**DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE D = 165 FT**

**PACKER INFLATION PRESSURE (D PSI + 50 PSI) PIP = 185 PSI**

**LEGEND:**

- **10 FT**
- **16.65 FT**
- **3.6 FT**
- **165 FT**
- **185 PSI**
- **171.8 FT**
- **57.12 FT**

---

**GZA BORING NO./TEST NO. MW-39 T3**

---
## PACKER TEST LOG

**Client:** Entergy Indian Point Energy Center  
**Project Location:** Buchanan, NY

### CONTRACTOR
Aquifer Drilling & Testing, Inc.

### FOREMAN
Lloyd Adams

### GZA ENG.
Sara Covelli

### BORING NO./TEST NO.
MW-39 T4

### BORING COORDINATES
- N: 462425.5051
- E: 604676.8687

### GROUND SURFACE EL. (FT)
81.864

### FINAL BORING DEPTH (FT)
199.3

### DATE START/END
4/06/06

### DIAMETER OF DRILLED BOREHOLE
3.83 inch

### I.D. OF DRILLING RODS
2 inch

### WATER FLOW DIRECTION

### TOTAL LENGTH OF TEST SECTION (FT)

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<th>ELAPSED TIME (Δ MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
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**NOTES:** Due to time constraints, a full recovery could not be achieved at this interval.

**LEGEND:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **BP:** TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
- **GWT:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **P:** INFLATABLE PACKERS
- **Q:** PERFORATED PIPE
- **10 FT**
- **16.65 FT**
- **3.6 FT**
- **152.2 FT**
- **185 PSI**
- **159 FT**
- **57.12 FT**
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy
**Project Location:** Indian Point Energy Center

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.
**FOREMAN:** Lloyd Adams
**GZA ENG.:** Sara Covelli

**BORING COORDINATES:**
- N 462425.5051
- E 604676.8687

**GROUND SURFACE EL. (FT):** 81.864
**DATE START/END:** 4/06/06

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 57.12 FT (from ground) 0.37 FT ground to casing

**INTERVAL TESTED DEPTH UNDER WATER (FT):**

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**LEGEND:**
- A: TOTAL LENGTH OF TEST SECTION (FT)
- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP: TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**NITROGEN SUPPLY LINE**

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**BP**

**LEGEND:**
- 10 FT
- 16.65 FT
- 3.6 FT
- 139.2 FT
- 185 PSI
- 146 FT
- 57.12 FT
NOTES: Due to time constraints, a full recovery could not be achieved at this interval.
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Lloyd Adams
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
I.D. OF DRILLING RODS: 2 INCH

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

<table>
<thead>
<tr>
<th>TESTED INTERVAL</th>
<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (DFT)</th>
<th>PUMPING RATE (gal/min)</th>
<th>SPECIFIC CAPACITY (gpm/ft)</th>
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GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client: Entergy
Project Location: Indian Point

Entergy
Indian Point Energy Center
Buchanan, NY
**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Lloyd Adams

**GZA ENG.**  
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**I.D. OF DRILLING RODS**  
2 INCH

---

**PACKER TEST LOG**

**TESTED INTERVAL FROM / TO (FT)**  
99.5-109.5

**TIME (HR:MIN:SEC)**  
8:45 0

**DEPTH UNDER WATER (FT)**  
48.957

**DEPTH TO WATER (FT)**  
53.74

**DRAWDOWN (ΔH FT)**  
1.243

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.158

**L= 10.0 ft**

**TIME (HR:MIN:SEC)**  
8:46 1

**DEPTH UNDER WATER (FT)**  
48.936

**DEPTH TO WATER (FT)**  
53.76

**DRAWDOWN (ΔH FT)**  
1.264

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.139

**TIME (HR:MIN:SEC)**  
8:47 2

**DEPTH UNDER WATER (FT)**  
48.909

**DEPTH TO WATER (FT)**  
53.79

**DRAWDOWN (ΔH FT)**  
1.291

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.115

**TIME (HR:MIN:SEC)**  
8:48 3

**DEPTH UNDER WATER (FT)**  
48.889

**DEPTH TO WATER (FT)**  
53.81

**DRAWDOWN (ΔH FT)**  
1.311

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.098

**TIME (HR:MIN:SEC)**  
8:49 4

**DEPTH UNDER WATER (FT)**  
48.867

**DEPTH TO WATER (FT)**  
53.83

**DRAWDOWN (ΔH FT)**  
1.333

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.080

**TIME (HR:MIN:SEC)**  
8:50 5

**DEPTH UNDER WATER (FT)**  
48.851

**DEPTH TO WATER (FT)**  
53.85

**DRAWDOWN (ΔH FT)**  
1.349

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.067

**TIME (HR:MIN:SEC)**  
8:51 6

**DEPTH UNDER WATER (FT)**  
48.836

**DEPTH TO WATER (FT)**  
53.86

**DRAWDOWN (ΔH FT)**  
1.364

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.056

**TIME (HR:MIN:SEC)**  
8:52 7

**DEPTH UNDER WATER (FT)**  
48.814

**DEPTH TO WATER (FT)**  
53.89

**DRAWDOWN (ΔH FT)**  
1.386

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.039

**TIME (HR:MIN:SEC)**  
8:53 8

**DEPTH UNDER WATER (FT)**  
48.797

**DEPTH TO WATER (FT)**  
53.90

**DRAWDOWN (ΔH FT)**  
1.403

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.026

**TIME (HR:MIN:SEC)**  
8:54 9

**DEPTH UNDER WATER (FT)**  
48.787

**DEPTH TO WATER (FT)**  
53.91

**DRAWDOWN (ΔH FT)**  
1.413

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.019

**TIME (HR:MIN:SEC)**  
8:55 10

**DEPTH UNDER WATER (FT)**  
48.765

**DEPTH TO WATER (FT)**  
53.94

**DRAWDOWN (ΔH FT)**  
1.435

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
1.003

**TIME (HR:MIN:SEC)**  
8:56 11

**DEPTH UNDER WATER (FT)**  
48.749

**DEPTH TO WATER (FT)**  
53.95

**DRAWDOWN (ΔH FT)**  
1.451

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
0.992

**TIME (HR:MIN:SEC)**  
8:57 12

**DEPTH UNDER WATER (FT)**  
48.749

**DEPTH TO WATER (FT)**  
53.95

**DRAWDOWN (ΔH FT)**  
1.451

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
0.992

**TIME (HR:MIN:SEC)**  
8:58 13

**DEPTH UNDER WATER (FT)**  
48.732

**DEPTH TO WATER (FT)**  
53.97

**DRAWDOWN (ΔH FT)**  
1.468

**PUMPING RATE (gal/min)**  
1.440

**SPECIFIC CAPACITY (gpm/ft)**  
0.981

---

**LEGEND:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client**

Entergy  
Indian Point Energy Center  
Buchanan, NY

**PROJECT LOCATION**

Indian Point

---

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Lloyd Adams

**GZA ENG.**

Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

---

**FIELD NO. 41.0017869.01**

---

**GZA**

**BORING NO./TEST NO. MW-39 T8**

**PROJECT LOCATION**

Indian Point

---

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Lloyd Adams

**GZA ENG.**

Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

---

**FIELD NO. 41.0017869.01**

---

**GZA**

**BORING NO./TEST NO. MW-39 T8**
PACKER TEST LOG

GZA GEONVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy Indian Point Energy Centre

PROJECT LOCATION: Indian Point

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Lloyd Adams
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
I.D. OF DRILLING RODS: 2 INCH

GROUND WATER DEPTH: 57.12 FT (from ground)
0.37 FT ground to casing

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
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<tr>
<th>TESTED INTERVAL FROM TO. (FT)</th>
<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
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LEGEND:
A = 10 FT
TP = 16.65 FT
BP = 3.6 FT
D = 89.3 FT
H1 = 185 PSI
H2 = 92.5 FT
IP = 57.12 FT
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client: Entergy
Indian Point Energy Centre
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Lloyd Adams
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
I.D. OF DRILLING RODS: 2 INCH

PACKER TEST LOG

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<th>DEPTH UNDER WATER (FT)</th>
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* A constant head test was also run at this interval.

LEGEND:

A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

NITROGEN SUPPLY LINE
FLOW RATE
GROUND SURFACE ELEVATION
WATER FLOW DIRECTION
INFLATABLE PACKERS
PERFORATED PIPE

GZA
BORING NO./TEST NO. MW-39 T10
## PACKER TEST LOG

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Contractor
Aquifer Drilling & Testing, Inc.

### Foreman
Lloyd Adams

### Project Location
Indian Point

### Drilling Coordinates
N 462425.5051
E 604676.8687

### Boring Coordinates
N 462425.5051
E 604676.8687

### Ground Surface EL (FT)
81.86

### Datum
NGVD 29

### Final Boring Depth (FT)
199.3

### Date Start/End
4/19/06

### Diameter of Drilled Borehole
3.83 INCH

### I.D. of Drilling Rods
2 INCH

### Water Flow Condition
- From: 22.718
- To: 59.98

### Depth to Water
- Under: 21.92
- Depth: 0.440
- Rate: 0.201

### Depth to Pumping Specific Capacity
- Flow Rate: 0.203

### Ground Surface Elevation
9:39: 0: 22.718: 59.98: 2.192: 0.440: 0.201

### Time Elapsed
- 9:40: 1: 22.742: 59.96: 2.168: 0.440: 0.203
- 9:41: 2: 22.735: 59.97: 2.175: 0.440: 0.202
- 9:42: 3: 22.720: 59.98: 2.19: 0.440: 0.201
- 9:43: 4: 22.741: 59.96: 2.169: 0.440: 0.203
- 9:44: 5: 22.741: 59.96: 2.169: 0.440: 0.203
- 9:45: 6: 22.741: 59.96: 2.169: 0.440: 0.203
- 9:46: 7: 22.735: 59.97: 2.175: 0.440: 0.202
- 9:47: 8: 22.735: 59.97: 2.175: 0.440: 0.202
- 9:49: 10: 22.726: 59.97: 2.184: 0.440: 0.201
- 9:50: 11: 22.727: 59.97: 2.183: 0.440: 0.202
- 9:51: 12: 22.702: 60.00: 2.208: 0.440: 0.199
- 9:52: 13: 22.686: 60.01: 2.224: 0.440: 0.198
- 9:53: 14: 22.701: 60.00: 2.209: 0.440: 0.199
- 9:54: 15: 22.701: 60.00: 2.209: 0.440: 0.199
- 9:55: 16: 22.685: 60.02: 2.225: 0.440: 0.198
- 9:56: 17: 22.690: 60.01: 2.22: 0.440: 0.198
- 9:57: 18: 22.675: 60.03: 2.235: 0.440: 0.197

### Water Flow Direction
- H1: Distance between water pressure gauge and ground surface
- H2: Distance between ground surface and ground water Table

### Nitrogen Supply Line
- How it is used in the test

### Inflatable Packers
- Purpose of being inflated

### Perforated Pipe
- Connection to water source

### TP - Total Length of Top Packer and Assembly
10 FT

### BP - Total Length of Bottom Backer and Assembly
16.65 FT

### D - Distance Between Ground Surface and Top of the Test Zone
3.6 FT

### PIP - Pack er Inflation Pressure (D PSI + 50 PSI)
78.5 FT

### H1 - Distance Between Water Pressure Gauge and Ground Surface
185 PSI

### H2 - Distance Between Ground Surface and Ground Water Table
82.7 FT

### A - Total Length of Test Section (FT)
57.12 FT

---

* A recovery test was also run at this interval.

---

**Legend:**
- A - Total Length of Test Section (FT)
- TP - Total Length of Top Packer and Assembly
- BP - Total Length of Bottom Backer and Assembly
- D - Distance Between Ground Surface and Top of the Test Zone
- PIP - Pack er Inflation Pressure (D PSI + 50 PSI)
- H1 - Distance Between Water Pressure Gauge and Ground Surface
- H2 - Distance Between Ground Surface and Ground Water Table
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Centre
Buchanan, NY

PROJECT LOCATION: Indian Point

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Lloyd Adams
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH (STATIC WATER LEVEL DEPTH): 57.79 FT
GROUND SURFACE ELEVATION: 81.864 FT DATUM NGVD 29
FINAL BORING DEPTH (FT): 199.3
DATE START/END: 4/19/06

I.D. OF DRILLING RODS: 2 INCH

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
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FLOW RATE
GROUND SURFACE ELEVATION
GROUND WATER TABLE
WATER FLOW DIRECTION
INFLATABLE PACKERS
PERFORATED PIPE
PACKER INFLATION PRESSURE
NITROGEN SUPPLY LINE

---

PACKER TEST LOG

BOURING NO./TEST NO.: MW-39 T11

---

GZA
400 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

---

10 FT
16.65 FT
3.6 FT
57.12 FT
185 PSI
72.7 FT
69.5 FT
50 PSI
GZ
MW-39 T11

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CONTRACTOR** Aquifer Drilling & Testing, Inc.
**FOREMAN** Lloyd Adams
**GZA ENG.** Sara Covelli

**DIAMETER OF DRILLED BOREHOLE** 3.83 INCH

**GZA** BORING NO./TEST NO. MW-39 T12

**FILE NO.** 41.0017869.01

**PROJECT LOCATION** Indian Point

**FILE NO.** 41.0017869.01

**FILE NO.** 41.0017869.01

**FILE NO.** 41.0017869.01

**FILE NO.** 41.0017869.01

**FILE NO.** 41.0017869.01

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**PACKER TEST LOG**

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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT) = 10 FT
- **BP** - TOTAL LENGTH OF BOTTOM BACKER AND ASSEMBLY = 3.6 FT
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 59.2 FT
- **GWT** - GROUND WATER TABLE = 57.12 FT
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE = 185 PSI
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 62.4 FT

---

**FLOW RATE**

**NIITROGEN SUPPLY LINE**

**GROUNDSURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 16.65 FT

---

**PACKER INFLATION PRESSURE**

**INTERVAL**

**TESTED DEPTH UNDER WATER (FT)**

**DEMOIATION TIME (MIN)**

**DETHвлажн UNDER WATER (FT)**

**DEPTH TO WATER (FT)**

**DRAWDOWN RATE (gpm/ft)**

**SPECIFIC CAPACITY (gpm/ft)**

---

**GZA** BORING NO./TEST NO. MW-39 T12
## PACKER TEST LOG

### Client
Entergy Indian Point Energy Center
Buchanan, NY

### Project Location
Indian Point

### Contractor
Aquifer Drilling & Testing, Inc.

### Foreman
Lloyd Adams

### GZA Eng.
Sara Covelli

### Client Boring/Test No.
MW-40 T1

### Boring Coordinates
N 461950.5094 E 603899.3458

### Datum
NGVD 29

### Final Boring Depth (ft)
193

### Date Start/End
5/10/06

### Diameter of Drilled Borehole
3.83 INCH

### Ground Water Depth
16.07 FT (from ground) 0.25 FT ground to casing

### I.D. of Drilling Rods
2 INCH

### Test Details

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<th>Interval</th>
<th>Time (Min:Sec)</th>
<th>Elapsed Time (Min:Sec)</th>
<th>Depth (ft)</th>
<th>Cumulative Recovery Rate (ft/hr)</th>
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**NOTE:** Due to time constraints, a full recovery could not be achieved at this interval.

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### LEGEND:
- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **G**: GROUND WATER DEPTH
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **Q**: VOL/TIME = (D/H) * CONV FACTOR
- **TP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)

### NITROGEN SUPPLY LINE
- FLOW RATE
- WATER FLOW DIRECTION
- PACKER INFLATION PRESSURE
- GROUND SURFACE ELEVATION
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
I.D. OF DRILLING RODS: 2 INCH

FOREMAN: Lloyd Adams
GROUND WATER DEPTH: 16.11 (from ground) 0.25 FT ground to casing

Packer Inflation Pressure: 185 PSI

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - Packer Inflation Pressure (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
Q = VOL/TIME = (ΔH/ΔT) * CONV FACTOR (0.653 GAL/FT)

NOTE: Due to time constraints, a full recovery could not be achieved at this interval.
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Client**: Entergy  
Indian Point Energy Center  
Buchanan, NY  

**CONTRACTOR**: Aquifer Drilling & Testing, Inc.  
**FOREMAN**: Lloyd Adams  
**GZA ENG.**: Sara Covelli  

**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH  
**I.D. OF DRILLING RODS**: 2 INCH  

#### TESTED INTERVAL FROM / TO (FT)

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#### LEGEND:
- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **Q**: VOL/TIME = (QH/H) * CONV FACTOR (0.653 GAL/FT)

**GZA**  
BORING NO./TEST NO.: MW-40 T3
# PACKER TEST LOG

**Client**: Indian Point Energy Center  
**Project Location**: Buchanan, NY

**Contractor**: Aquifer Drilling & Testing, Inc.

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<th>3.83 INCH</th>
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<td>I.D. of Drilling Rods</td>
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**Boring Coordinates**
- North: 461950.5094  
- East: 603899.3458

**Final Boring Depth**
- Depth: 193 ft  
- Datum: NGVD 29

**Descriptive Information**
- **Position Coordinates**:
  - Ground Surface Elevation: 74.987 ft 
  - Ground Water Depth: 16.13 ft from ground

**Log Details**

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**Legend**
- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packers and Assembly
- **BP**: Total Length of Bottom Packers and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Packers Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Groundwater Table
- **Q**: Volume/Time = (ΔH/ΔT) * Conv Factor (0.653 Gal/FT)

**Units**
- FT
- PSI
- ft
- Gal/Min
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LEGEND:
- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- Q = VOL/TIME = (ΔH/ΔT) * CONV FACTOR (0.653 GAL/FT)
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

---

**Client**  
Entergy Indian Point Energy Center

**Project Location**  
Buchanan, NY

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Lloyd Adams

**GZA Eng.**  
Sara Covelli

---

**Boring Coordinates**

- N 461950.5094  
- E 603899.3458

**Final Boring Depth (FT)**  
193

**Date Start/End**  
5/15/06

**Ground Water Depth**  
16.05 (from ground) 0.25 FT ground to casing

**Diameter of Drilled Borehole**  
3.83 INCH

**I.D. of Drilling Rods**  
2 INCH

---

**Table: Test Log Data**

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**Diagram:**

- **NITROGEN SUPPLY LINE**
- **FLOW RATE**
- **GROUND SURFACE ELEVATION**
- **WATER FLOW DIRECTION**
- **INFLATABLE PACKERS**
- **PERFORATED PIPE**
- **BASE PLATE (BP)**
- **TOTAL LENGTH OF TEST SECTION (FT)**
- **TOTAL LENGTH OF TOP PACKER AND ASSEMBLY**
- **TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY**
- **DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE**
- **DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE**

**Legend:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- Q = VOL/TIME = (ΔH/Δt) * CONV FACTOR (0.653 GAL/FT)

---

**GZA**

BORING NO./TEST NO. MW-40 T7

---

**GZA GEOSCIENTISTS AND ENGINEERS**

Entergy Indian Point Energy Center

Buchanan, NY
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY  

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.  

**FOREMAN**  
Lloyd Adams  

**GZA ENG.**  
Sara Covelli  

**DAMETER OF DRILLED BOREHOLE**  
3.83 INCH  

**I.D. OF DRILLING RODS**  
2 INCH  

**PROJECT LOCATION**  
Indian Point  

**BORING COORDINATES**  
N 461950.5094  
E 603899.3458  

**FINAL BORING DEPTH (FT)**  
193  

**DATE START/END**  
5/15/06  

**GROUND WATER DEPTH**  
16.15 (from ground)  

**0.25 FT ground to casing**  

**LEGEND:**  
- **A** - TOTAL LENGTH OF TEST SECTION (FT)  
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **P** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  
- **Q** - VOL/TIME = (ΔH/ΔT) * CONV FACTOR (0.653 GAL/FT)  

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## PACKER TEST LOG

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Contractor
Aquifer Drilling & Testing, Inc.

### Foreman
Lloyd Adams

### GQA Eng.
Sara Covelli

### Project Location
Indian Point

### Boring Number/Test Number
MW-40 T9

### Sheet
1 of 1

### File No.
41.0017869.01

### Boring Coordinates
N 461950.5094 E 603899.3458

### Final Boring Depth (FT)
193

### Datum
NGVD 29

### Date Start/End
5/15/06

### Ground Water Depth (ft)
16.15

### (Static Water Level Depth)
0.25 ft ground to casing

### Diameter of Drilled Borehole
3.83 inch

### I.D. of Drilling Rods
2 inch

### Water Flow Direction

### Nitrogen Supply Line

### Ground Surface Elevation

### Water Flow Direction

### Inflatable Packers

### Perforated Pipe

### Total Length of Test Section (ft)
L = 10.0 ft

### Total Length of Top Packer and Assembly
TP = 16.85 ft

### Total Length of Bottom Packer and Assembly
BP = 3.5 ft

### Distance Between Ground Surface and Top of the Test Zone
D = 44 ft

### Packers Inflation Pressure (D PSI + 50 PSI)

### Distance Between Water Pressure Gauge and Ground Surface
H1 = 55.2 ft

### Distance Between Ground Surface and Ground Water Table
H2 = 16.15 ft

### Flow Rate

### Volume/Time

### Conv Factor
(6.533 gal/ft)

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### PACKER TEST LOG

**Client:** Entergy Indian Point Energy Center  
**CONTRACTOR:** Aquifer Drilling & Testing, Inc.  
**PROJECT LOCATION:** Indian Point  
**LOCATION:** 440 NINTH AVENUE, 18th FLOOR, NEW YORK, NEW YORK 10001  
**FILE NO.:** 41.0017869.01  
**BORING NO./TEST NO.:** MW-40 T10

**BORING COORDINATES:**  
**N:** 461950.5094  
**E:** 603899.3458  
**DATE START/END:** 5/16/06

**DIA. OF DRILLED BOREHOLE:** 3.83 INCH  
**GROUND WATER DEPTH:** 16.26 FT

**I.D. OF DRILLING RODS:** 2 INCH

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**LEGEND:**  
- **A:** TOTAL LENGTH OF TEST SECTION (FT)  
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **H1:** DISTANCE BETWEEN GROUND SURFACE GAUGE AND GROUND SURFACE  
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  
- **Q:** VOL/TIME = (ΔH/D) * CONV FACTOR (0.653 GAL/FT)
**PACKER TEST LOG**

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **Q** = VOL/TIME = (DH/dt) * CONV FACTOR (0.653 GAL/FT)

**GZA GEOENVIRONMENTAL OF NEW YORK**

**BOARING NO./TEST NO.** MW-40 T11

**PROJECT LOCATION** Indian Point

**CONTRACTOR** Aquifer Drilling & Testing, Inc.

**FOREMAN** Lloyd Adams

**GZA ENG.** Sara Covelli

**DIA. OF DRILLED BOREHOLE** 3.83 INCH

**INTERMITENT INTERVAL** (HR:MIN:SEC)

**WATER FLOW DIRECTION**

**PACKER INFLATION PRESSURE**

**FLOW RATE**

**NITROGEN SUPPLY LINE**

**GROUND SURFACE ELEVATION**

**GROUND WATER TABLE**

**INFLATABLE PACKERS**

**PERFORATED PIPE**
## PACKER TEST LOG

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Contractor
Aquifer Drilling & Testing, Inc.

### Project Location
Indian Point

### Boring Coordinates
N 461950.5094
E 603899.3458

### Ground Surface EL (FT)
74.987

### Datum
NGVD 29

### Final Boring Depth (FT)
193

### Date Start/End
5/16/06

### Diameter of Drilled Borehole
3.83 INCH

### I.D. of Drilling Rods
2 INCH

### Ground Water Depth
16.26 FT from ground

### Static Water Level Depth
0.25 FT ground to casing

### Test Log

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### Legend
- A: Total Length of Test Section (FT)
- TP: Total Length of Top Packers and Assembly
- BP: Total Length of Bottom Packers and Assembly
- D: Distance Between Ground Surface and Top of the Test Zone
- PIP: Packers Inflation Pressure (D PSI + 50 PSI)
- H1: Distance Between Water Pressure Gauge and Ground Surface
- H2: Distance Between Ground Surface and Ground Water Table
- Q = Vol/Time = (ΔH/Δt) * Conv Factor (0.653 GAL/FT)

### Notes
- 10 FT = 10.0 ft
- 16.85 FT = 16.85 ft
- 3.5 FT = 3.5 ft
- 18 FT = 18 ft
- 185 PSI = 185 PSI
- 29.2 FT = 29.2 ft
- 16.26 FT = 16.26 ft
- 0.25 FT ground to casing

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 Ninth Avenue, 18th Floor
New York, New York 10010
Scientists and Engineers

**GZA BORING NO./TEST NO.**
MW-40 T12

**Sheet**
1 of 1

**File No.**
41.0017869.01

**Project Location**
Indian Point
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

**BORING NO./TEST NO.**
MW-51  T1

**FILE NO.**
41.0017869.01

### BORING COORDINATES
- N: 461.822.4272
- E: 604275.3373
- DATE START/END: 5/18/06

### GROUND SURFACE EL.(FT)
- 69.62
- DATUM: NGVD 29

### FINAL BORING DEPTH (FT)
- 198.8

### DIAMETER OF DRILLED BOREHOLE
- 3.83 INCH

### GROUND WATER DEPTH
- 27.66 (from ground)
- 0.26 FT ground to casing

### I.D. OF DRILLING RODS
- 2 INCH

### PACKER INFLATION PRESSURE

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<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY ((\Delta) FT)</th>
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### WATER FLOW DIRECTION
- GWT
- H1
- H2

### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
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- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA**

**BORING NO./TEST NO.**
MW-51  T1
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Centre
Buchanan, NY

** CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

**BORING NO./TEST NO.**
MW-51 T2

**FILE NO.**
41.0017869.01

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**DATE START/END**
5/18/06

**BORING COORDINATES**
N 461.822.4272
E 604275.3373

**GROUND SURFACE EL. (FT)**
69.62

**GROUND WATER DEPTH**
26.65 (from ground)
0.26 FT ground to casing

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**GROUND SURFACE ELEVATION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**FLOW RATE**

**LEGEND:**

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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**DATE START/END**
5/18/06

**BORING COORDINATES**
N 461.822.4272
E 604275.3373

**GROUND SURFACE EL. (FT)**
69.62

**GROUND WATER DEPTH**
26.65 (from ground)
0.26 FT ground to casing

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**GROUND SURFACE ELEVATION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**FLOW RATE**

**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
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- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**GZA**

**BORING NO./TEST NO.**
MW-51 T2

**FILE NO.**
41.0017869.01

**PROJECT LOCATION**
Indian Point
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**FLOOR DATE START/END**
18th 5/18/06

**PROJECT LOCATION**
Indian Point

**Client**

**BORING NO./TEST NO.**
MW-51 T3

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GROUND SURFACE EL.(FT)**
69.62

**GROUND WATER DEPTH**
27.95 (from ground) 0.26 FT ground to casing

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**I.D. OF DRILLING RODS**
2 INCH

---

**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)

**I.D. OF DRILLING RODS**
2 INCH

**TIME (HR:MIN)**

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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
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- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**FLOOR DATE START/END**
18th 5/18/06

---

**WATER FLOW DIRECTION**

**GROUND SURFACE ELEVATION**

**FLOW RATE**

---

**NITROGEN SUPPLY LINE**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS
### PACKER TEST LOG

#### GZA GEOSCIENCES OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

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#### CONTRACTOR: Aquifer Drilling & Testing, Inc. BORING COORDINATES

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#### FOREMAN: Ed Borner GROUND SURFACE EL.(FT)

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#### DIAMETER OF DRILLED BOREHOLE

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#### I.D. OF DRILLING RODS

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#### LEGEND:
- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

### PACKER TEST LOG Diagram

- Packer Inflation Pressure
- Flow Rate
- Ground Surface Elevation
- Water Flow Direction
- Inflatable Packers
- Perforated Pipe
- BP - Total Length of Bottom Packers and Assembly
- TP - Total Length of Top Packers and Assembly
- GZ - Client: Entergy Indian Point Energy Centre Buchanan, NY
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**BORING NO./TEST NO.**
MW-51 T5

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
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- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
## PACKER TEST LOG

**Client:** Entergy Indian Point Energy Centre  
**Project Location:** Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Ed Borner  
**GZA Eng.:** Sara Covelli

**Boring Coordinates:**
- N: 461.822.4272  
- E: 604275.3373

**Ground Surface El.(FT):** 69.62  
**Datum:** NGVD 29

**Final Boring Depth (FT):** 198.8  
**Date Start/End:** 5/19/06

**Diameter of Drilled Borehole:** 3.83 inch  
**Ground Water Depth:** 27.87 (from ground)  
(STATIC WATER LEVEL DEPTH)

**I.D. of Drilling Rods:** 2 inch

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**Legend:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)  
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**GZA GEONEUROSCIENTISTS AND ENGINEERS OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001

**Entergy Indian Point Energy Centre**  
Buchanan, NY

**Indian Point Energy Centre**  
Buchanan, NY

**Nitrogen Supply Line**

**Flow Rate**

**Ground Surface Elevation**

**Water Flow Direction**

**Inflatable Packers**

**Perforated Pipe**

**BP**

**TP**

**A**

**H2**

**H1**

**GWT**

**D**

**P**

**Q**

**Flow Rate**

**Ground Surface Elevation**

**Water Flow Direction**

**Inflatable Packers**

**Perforated Pipe**

**BP**

**TP**

**A**

**H2**

**H1**

**GWT**

**D**

**P**

**Q**
CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Ed Borner
GZA ENG: Sara Covelli
PROJECT LOCATION: Indian Point

**Boring Coordinates**
N 461.822
E 604.275

**Boring Depth (FT)**
198.8

**Ground Surface EL (FT)**
69.62

**Ground Water Depth (from ground)**
26.65

**Ground Water Table (STATIC WATER LEVEL DEPTH)**
0.26 (ground to casing)

**Diameter of Drilled Borehole**
3.83 inch

**I.D. of Drilling Rods**
2 inch

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### Test Log

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**Legend:***
- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packers and Assembly
- **BP**: Total Length of Bottom Packers and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Packers Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table

---

**Flow Rate**

---

**NITROGEN SUPPLY LINE**

---

**GROUND SURFACE ELEVATION**

---

**WATER FLOW DIRECTION**

---

**INFLATABLE PACKERS**

---

**PERFORATED PIPE**

---

**BP**

---

**TP**

---

**A**

---

**H2**

---

**GWT**

---

**D**

---

**H1**

---

**L**: 9.7 ft

---

**LEGEND:**

- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packers and Assembly
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- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table
## PACKER TEST LOG

### Client
**Entergy**
**Indian Point Energy Center**
**Buchanan, NY**

### Project Location
**Indian Point**

### Contractor
**Aquifer Drilling & Testing, Inc.**

### Foreman
**Ed Borner**

### GZA Eng.
**Sara Covelli**

### Boring Coordinates
**N 461.822.4272**
**E 604275.3373**

### Ground Surface EL (FT)
**69.62**

### Datum
**NGVD 29**

### Date Start/End
**5/22/06**

### Final Boring Depth (FT)
**198.8**

### Diameter of Drilled Borehole
**3.83 INCH**

### I.D. of Drilling Rods
**2 INCH**

### Ground Water Depth
**27.80 ft**

### Boring Test Section

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### Flow Rate

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<td>H1 - Distance Between Ground Surface and Top of Test Zone</td>
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### Legend
- **A** - Total Length of Test Section (FT)
- **TP** - Total Length of Top Packer and Assembly
- **BP** - Total Length of Bottom Packer and Assembly
- **D** - Distance Between Ground Surface and Top of the Test Zone
- **PIP** - Packer Inflation Pressure (D PSI + 50 PSI)
- **H1** - Distance Between Ground Surface and Ground Water Table
- **H2** - Distance Between Water Pressure Gauge and Ground Surface

---

**Note:**
- Flow rates are listed in **ft/min**.
- Recovery rates are listed in **Hr/FT**.
PACKER TEST LOG

GZA GEONVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client
Entergy
Indian Point Energy Centre
Buchanan, NY

CONTRACTOR
Aquifer Drilling & Testing, Inc.

FOREMAN
Ed Borner

GZA ENG.
Sara Covelli

DIMENSIONS
DIAMETER OF DRILLED BOREHOLE
3.83 INCH

GROUND WATER DEPTH
27.41 (from ground)
0.26 FT ground to casing

LEGEND:

A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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GZA GEONVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client: Entergy
Indian Point Energy Centre
Buchanan, NY

BORING NO./TEST NO. MW-51 T10
SHEET 1 of 1
FILE NO. 41.0017869.01
PROJECT LOCATION Indian Point

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Ed Borner
GZA ENG.: Sara Covelli

PROJECT LOCATION: Indian Point

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 26.82 (from ground) 0.26 FT ground to casing

I.D. OF DRILLING RODS: 2 INCH

TESTED INTERVAL FROM TO (FT)

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LEGEND:
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- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 16.74 FT
- BP: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = 4.13 FT
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 88.8 FT
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI) = 165 PSI
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE = 100.1 FT
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 26.82 FT

GZA
BORING NO./TEST NO. MW-51 T10
## PACKER TEST LOG

**GZA GEONVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

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**LEGEND:**
- A: TOTAL LENGTH OF TEST SECTION (FT)
- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**Flow Rate Diagram:**
- Water Flow Direction
- Ground Surface Elevation
- Perforated Pipe
- Inflatable Packers
- Total Pressure (TP)

**NITROGEN SUPPLY LINE**

---

**Diagram Details:**
- Water Flow Direction
- Ground Surface Elevation
- Inflatable Packers
- Perforated Pipe
- Total Pressure (TP)

---

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

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Entergy
Indian Point Energy Centre
Buchanan, NY

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Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point
**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

**Client**

Entergy

Indian Point Energy Centre

Buchanan, NY

**BOARING COORDINATES**

N 461.822.4272  E 604275.3373

**GROUND SURFACE EL.(FT)**

69.62

**Datum**

NGVD 29

**DATE START/END**

5/23/06 5/23/06

**PROJECT LOCATION**

Indian Point

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Ed Borner

**GZA ENG.**

Sara Covelli

**DIAmeter of Drilled Borehole**

3.83 INCH

**GROUND WATER DEPTH**

27.47 (from ground)

0.26 FT ground to casing

**I.D. of Drilling Rods**

2 INCH

---

**TESTED INTERVAL**

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**LEGEND:**

A - TOTAL LENGTH OF TEST SECTION (FT)

B - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY

D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE

P - PACKER INFLATION PRESSURE (D PSI + 50 PSI)

H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
## PACKER TEST LOG

**GZA GEONENVIRONMENTAL OF NEW YORK**

### Project Location
Indian Point

### Client
Entergy

### Indian Point Energy Centre
Buchanan, NY

### Boring No./Test No.
MW-51 T13

### Boring Coordinates
N 461.822.4272, E 604275.3373

### Ground Surface EL (FT)
69.62

### Datum
NGVD 29

### Final Boring Depth (FT)
198.8

### Date Start/End
5/24/06

---

### Client
Entergy

### Indian Point Energy Centre
Buchanan, NY

### Boring No./Test No.
MW-51 T13

### Boring Coordinates
N 461.822.4272, E 604275.3373

### Ground Surface EL (FT)
69.62

### Datum
NGVD 29

### Final Boring Depth (FT)
198.8

### Date Start/End
5/24/06

---

### Diameter of Drilled Borehole
3.83 inch

### Ground Water Depth
27.10 (from ground)

---

### Time Elapsed
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### Diagram:

- **NITROGEN SUPPLY LINE**
- **FLOW RATE**
- **GROUND SURFACE ELEVATION**
- **WATER FLOW DIRECTION**
- **INFLATABLE PACKERS**
- **PERFORATED PIPE**
- **PACKER INFLATION PRESSURE**

---

### Legend:

- **A** - Total Length of Test Section (FT)
- **TP** - Total Length of Top Packers and Assembly
- **BP** - Total Length of Bottom Packers and Assembly
- **D** - Distance Between Ground Surface and Top of the Test Zone
- **PIP** - Packers Inflation Pressure (D PSI + 50 PSI)
- **H1** - Distance Between Water Pressure Gauge and Ground Surface
- **H2** - Distance Between Ground Surface and Ground Water Table

---

### GZA

**BORING NO./TEST NO.**
MW-51 T13

**FILE NO.**
41.0017869.01

**PROJECT LOCATION**
Indian Point
**PACKER TEST LOG**

**Client:** Entergy Indian Point Energy Centre
**Location:** Buchanan, NY

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.
**FOREMAN:** Ed Borner
**GZA ENG.:** Sara Covelli

**BORING NO./TEST NO.:** MW-51 T14
**FILE NO.:** 41.0017869.01

**PROJECT LOCATION:** Indian Point

**DIA. OF DRILLED BOREHOLE:** 3.83 INCH

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**GZA GEOENVIRONMENTAL OF NEW YORK**
**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**
**SCIENTISTS AND ENGINEERS**

**LEGEND:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**UNIT MEASUREMENTS:**
- **L:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE

**QP D D**

**Legend:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**UNIT MEASUREMENTS:**
- **L:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

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**BORING COORDINATES**

- **N**: 461.822.4272
- **E**: 604275.3373

**GROUND SURFACE EL. (FT)**: 69.62

**DATE START/END**: 5/24/06

**FINAL BORING DEPTH (FT)**: 198.8

**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH

**I.D. OF DRILLING RODS**: 2 INCH

**GROUND WATER DEPTH**: 27.03 (from ground) 0.26 FT ground to casing

---

**TESTED INTERVAL (FROM TO) (FT)**

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**LEGEND:**

- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA**

BORING NO./TEST NO.: MW-51 T15

---

**FLOW RATE**

**NITROGEN SUPPLY LINE**

**Packer Inflation Pressure**

**Ground Surface Elevation**

**Water Flow Direction**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

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## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy Indian Point Energy Centre

**PROJECT LOCATION:** Indian Point

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Ed Borner

**GZA ENG.:** Steve Kline

### BORING COORDINATES
- **N:** 463253.9453
- **E:** 604733.0454
- **DATE START/END:** 5/30/06
- **GZAD:** 41.0017869.01

### DIALECT OF DRILLED BOREHOLE
- **DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH
- **I.D. OF DRILLING RODS:** 2 INCH

### GROUND SURFACE EL.(FT)
- **GROUND SURFACE EL.(FT):** 16.77
- **DATUM:** NGVD 29

### FINAL BORING DEPTH (FT)
- **FINAL BORING DEPTH (FT):** 193.0

### DIAMETER OF DRILLED BOREHOLE
- **DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

### GROUND WATER DEPTH
- **GROUND WATER DEPTH:** 10.5 (from ground) 0.43 FT ground to casing

### TESTED INTERVAL (FT)
- **TESTED INTERVAL FROM/TO (FT):** 179.5-189.2
- **L:** 9.7 ft

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### LEGEND:
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **Q:** FLOW RATE
- **P:** NITROGEN SUPPLY LINE
- **O:** NITROGEN SUPPLY LINE
- **H1:** GROUND SURFACE ELEVATION
- **H2:** WATER FLOW DIRECTION
- **GWT:** GROUND WATER TABLE
- **A:** INFLATABLE PACKERS
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Client**  
Entergy  
Indian Point Energy Centre  
Buchanan, NY  

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.  

**FOREMAN**  
Ed Borner  

**GZA ENG.**  
Steve Kline  

**PROJECT LOCATION**  
Indian Point  

### BORING COORDINATES
- N: 463253.9453  
- E: 604733.0454  

### FINAL BORING DEPTH (FT)
- 193.0  
- DATE START/END: 5/30/06  

### DIAMETER OF DRILLED BOREHOLE
- 3.83 INCH  

### GROUND WATER DEPTH
- 17.8 (from ground)  
- 0.43 FT ground to casing  

### I.D. OF DRILLING RODS
- 2 INCH  

### TIME ELAPSED DEPTH TO CUMULATIVE RECOVERY
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### LEGEND:
- **A**: TOTAL LENGTH OF TEST SECTION (FT)  
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **PIP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
## PACKER TEST LOG

### GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

### Client
Entergy
Indian Point Energy Centre
Buchanan, NY

### BORING COORDINATES
- N: 463253.9453
- E: 604733.0454
- Datum: NGVD 29

### PROJECT LOCATION
Indian Point

### CONTRACTOR
Aquifer Drilling & Testing, Inc.

### FOREMAN
Ed Borner

### GZA ENG.
Sara Covelli

### DIAMETER OF DRILLED BOREHOLE
3.83 INCH

### GROUND WATER DEPTH
12.60 (from ground) 0.43 FT ground to casing

### I.D. OF DRILLING RODS
2 INCH

### PACKER TEST LOG

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**LEGEND:**
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- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- L: 9.7 FT
- = 9.7 FT
- = 16.74 FT
- = 4.13 FT
- = 158.3 FT
- = 175 PSI
- = 169.2 FT
- = 12.60 FT

---

**Diagram:**
- GROUND SURFACE ELEVATION
- WATER FLOW DIRECTION
- INFLATABLE PACKERS
- PERFORATED PIPE
- NITROGEN SUPPLY LINE
- FLOW RATE
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

**BORING NO./TEST NO.**
MW-52 T4

**FILE NO.**
41.0017869.01

**DATE START/END**
5/31/06

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**LEGEND:**

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- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**FLOW RATE**

**NITROGEN SUPPLY LINE**

**PACKER INFLATION PRESSURE**

**DIAGRAM:**

- **P:** Packers
- **Q:** Test Section
- **H1:** Distance between water pressure gauge and ground surface
- **H2:** Distance between ground surface and ground water table
- **D:** Distance between ground surface and top of the test zone
- **TP:** Total length of top packer and assembly
- **BP:** Total length of bottom packer and assembly
- **A:** Total length of test section (FT)
- **D:** Distance between ground surface and top of the test zone
- **BP:** Total length of bottom packer and assembly
- **A:** Total length of test section (FT)
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy
**Project Location:** Indian Point
**File No.:** 41.0017869.01

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Ed Borner
**GZA Eng.:** Sara Covelli

**Boring No./Test No.:** MW-52 T5
**Sheet:** 1 of 1

**Boring Coordinates:**
- N: 463253.9453
- E: 604733.0454

**Ground Surface EL.(FT):** 16.77
**Final Boring Depth (FT):** 193.0
**Date Start/End:** 5/31/06

**Geotechnical Details:**
- **Drilled Borehole Diameter:** 3.83 inch
- **Ground Water Depth:** 15.40 ft (from ground)
- **Ground Water Depth (Static Water Level Depth):** 0.43 ft
- **Inflatable Packers:**
  - Total Length of Test Section (FT): 9.7
  - Total Length of Top Packers: 16.74 ft
  - Total Length of Bottom Packers: 4.13 ft
  - Distance Between Ground Surface and Top of Test Zone: 133.2 ft
  - Packers Inflation Pressure: 160 psi
  - Distance Between Water Pressure Gauge and Ground Surface: 144.2 ft
  - Distance Between Ground Surface and Ground Water Table: 15.40 ft

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**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of Test Zone
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
**PACKER TEST LOG**

**GZA GEONENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**SCIENTISTS AND ENGINEERS**

**CONTRACTOR** Aquifer Drilling & Testing, Inc.

**FOREMAN** Ed Borner

**GZA ENG.** Sara Covelli

**PROJECT LOCATION** Indian Point

**DATE** 6/1/06

---

**DIAmeter of Drilled Borehole** 3.83 INCH

**I.D. of Drilling Rods** 2 INCH

---

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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA**

BORING NO./TEST NO.: MW-52 T6
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client:** Entergy  
Indian Point Energy Centre  
Buchanan, NY

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.  
**BORING COORDINATES:** N 463253.9453  
E 604733.0454

**FOREMAN:** Ed Borner  
**GROUND SURFACE EL.(FT):** 16.77  
**DATUM:** NGVD 29

**GZA ENG.:** Sara Covelli  
**FINAL BORING DEPTH (FT):** 193.0  
**DATE START/END:** 6/1/06

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH  
**GROUND WATER DEPTH:** (STATIC WATER LEVEL DEPTH) 14.90 (from ground)  
0.43 FT ground to casing  
**I.D. OF DRILLING RODS:** 2 INCH

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**LEGEND:**  
- **A:** TOTAL LENGTH OF TEST SECTION (FT)  
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
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**SCIENTISTS AND ENGINEERS:**  
GZA GEOENVIRONMENTAL OF NEW YORK  
Buchanan, NY

---
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**CONTRACTOR BORING**

 Coordinates N 463253.9453 E 604733.0454

**FOREMAN**

Ed Borner

**FINAL BORING DEPTH**

52 ft

**DATE START/END**

6/1/06

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**GROUND WATER DEPTH**

16.65 (from ground) 0.43 FT ground to casing

**GZA ENG.**

Sara Covelli

**GZ A**

**SCIENTISTS AND ENGINEERS**

GZA GEOENVIRONMENTAL OF NEW YORK

**PROJECT LOCATION**

Indian Point

---

**PACKER INFLATION PRESSURE**

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<th>DEPTH UNDER WATER (FT)</th>
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*** NOTE: Extremely heavy rain began at approximately 1300 hrs.

**LEGEND:**

- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **G** : GROUND SURFACE ELEVATION
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **L**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **P**: PACKER INFLATION PRESSURE (D PSI × 50 PSI)

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**PERFORATED PIPE**

**INFLATABLE PACKERS**

**WATER FLOW DIRECTION**

---

**NOTE:**

- 9.7 FT
- 16.74 FT
- 4.13 FT
- 89.0 FT
- 165 PSI
- 100.1 FT
- 16.65 FT

---

GZA

BORING NO./TEST NO. MW-52 T8

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**CONTRACTOR BORING**

 Coordinates N 463253.9453 E 604733.0454

**FOREMAN**

Ed Borner

**FINAL BORING DEPTH**

52 ft

**DATE START/END**

6/1/06

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**GROUND WATER DEPTH**

16.65 (from ground) 0.43 FT ground to casing

**GZA ENG.**

Sara Covelli

**GZ A**

**SCIENTISTS AND ENGINEERS**

GZA GEOENVIRONMENTAL OF NEW YORK

**PROJECT LOCATION**

Indian Point
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.
**FOREMAN:** Ed Borner
**GZA ENG.** Sara Covelli

**PROJECT LOCATION:** Indian Point

**BORING NO./TEST NO.:** MW-52 T9

**SENIOR PROJECT MANAGER:** Sara Covelli

---

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH** (STATIC WATER LEVEL DEPTH)
from ground: 10.25 FT

ground to casing: 0.43 FT

**I.D. OF DRILLING RODS:** 2 INCH

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**NOTE:** Due to time constraints and low yield, full recovery could not be achieved at this interval.

**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
### PACKER TEST LOG

**GZA GEONVIRONMENTAL OF NEW YORK**

**Client**  
Entergy  
Indian Point Energy Centre  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Ed Borner

**GZA ENG.**  
Sara Covelli

**PROJECT LOCATION**  
Indian Point

**BORING NO./TEST NO.**  
MW-52 T10

**BOARING COORDINATES**  
N 463253.9453  E 604733.0454

**DATE START/END**  
6/2/06

**FINAL BORING DEPTH (FT)**  
193.0

**GROUND SURFACE EL.(FT)**  
16.77

**GROUND WATER DEPTH**  
13.67 (from ground) 0.43 FT ground to casing

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**I.D. OF DRILLING RODS**  
2 INCH

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**NOTE:** Due to time constraints and low yield, full recovery could not be achieved at this interval.

**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
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- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**GZA**

**BORING NO./TEST NO.**  
MW-52 T10

**FILE NO.**  
41.0017869.01

**New York, New York 10001**
## PACKER TEST LOG

### Client
- Entergy
- Indian Point Energy Centre
- Buchanan, NY

### BORING COORDINATES
- N 463253.9453
- E 604733.0454

### GROUND SURFACE EL.(FT)
- 16.77

### Datum
- NGVD 29

### BORING DEPTH (FT)
- 193.0

### Date Start/End
- 6/5/06

### DIAMETER OF DRILLED BOREHOLE
- 3.83 INCH

### DIAMETER OF DRILLING RODS
- 2 INCH

### I.D. OF INFLATABLE PACKERS
- TP
- BP

### Water Flow Direction
- H1
- H2

### Nitrogen Supply Line
- P

### Flow Rate
- Q

### Table: Flow Rate

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**NOTE:** Due to time constraints and low yield, full recovery could not be achieved at this interval.

### Legend:
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **L:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
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- **P:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

### Client
- Entergy
- Indian Point Energy Centre
- Buchanan, NY

### BORING NO./TEST NO.
- MW-52 T11

### SHEET
- 1 of 1

### FILE NO.
- 41.0017869.01

### PROJECT LOCATION
- Indian Point
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CONTROLLER**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Ed Borner

**GZA ENG.**
Sara Covelli

**PROJECT LOCATION**
Indian Point

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**BORING COORDINATES**

- **N**: 463253.9453
- **E**: 604733.0454

**GROUND SURFACE EL. (FT)**: 16.77
**DATE START/END**: 6/5/06
**FINAL BORING DEPTH (FT)**: 193.0
**GROUND WATER DEPTH (FT)**: 14.26

**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH
**GROUND SURFACE EL.(FT)**: 16.77
**DATUM**: NGVD 29
**DIAMETER OF DRILLING RODS**: 2 INCH

### TESTED INTERVAL (FROM TO, FT)

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**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Centre
Buchanan, NY

**PREPARED BY**
Sara Covelli

**DATE**
6/5/06

**FILE NO.**
41.0017869.01

**PROJECT LOCATION**
Indian Point
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy

**Indian Point Energy Center**

**Buchanan, NY**

**PROJECT LOCATION:** Indian Point

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Ed Borner

**GZA ENG.:** Sara Covelli

**BORING NO./TEST NO.:** MW-52 T13

**FILE NO.:** 41.0017869.01

**FILE NO.:** 41.0017869.01

**DATE START/END:** 6/5/06

**GROUND WATER DEPTH:** 14.82 ft (from ground)

**GROUND WATER DEPTH:** 0.43 ft ground to casing

**DIAMETER OF DRILLED BOREHOLE:** 3.83 inch

**I.D. OF DRILLING RODS:** 2 inch

### TESTED INTERVAL FROM / TO (FT)

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<th>ELAPSED TIME (HR:MIN)</th>
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**NOTE:** Due to time constraints and low yield, full recovery could not be achieved at this interval.

### LEGEND:

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**NITROGEN SUPPLY LINE:**

- **FLOW RATE:**
- **GROUND SURFACE ELEVATION:**
- **WATER FLOW DIRECTION:**
- **INFLATABLE PACKERS:**
- **PERFORATED PIPE:**
- **GROUND WATER TABLE:**
- **A:**
- **BP:**
- **TP:**

**NOTE:**
**PACKER TEST LOG**

GZA GEODENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client
Entergy
Indian Point Energy Centre
Buchanan, NY

BORING NO./TEST NO. MW-52 T14

CONTRACTOR Aquifer Drilling & Testing, Inc.

FOREMAN Ed Borner

GZA ENG. Sara Covelli

PROJECT LOCATION Indian Point

FILE NO. 41.0017869.01

N 463253.9453 E 604733.0454

440 NINTH AVENUE, 18th FLOOR SHEET 1 of 1

NEW YORK,  NEW YORK 10001

GROWTH NO. / TEST NO. MW-52 T14

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<th>TESTED INTERVAL</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (Δ MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
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NOTE: Due to time constraints and low yield, full recovery could not be achieved at this interval.

LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**Flow Rate**

**NITROGEN SUPPLY LINE**

FLOW RATE

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**BP**

**TP**

**A**

**D**

**H1**

**H2**

**GWT**

**P**

**Q**

**Legend:**

- **10** = 9.7 FT
- **11** = 16.74 FT
- **12** = 4.13 FT
- **13** = 28.2 FT
- **14** = 150 PSI
- **15** = 39.5 FT
- **16** = 11.10 FT
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy Indian Point Energy Centre
Buchanan, NY

**Contractor**

Aquifer Drilling & Testing, Inc.

**Foreman**

Ed Borner

**GZA Eng.**

Sara Covelli

**Project Location**

Indian Point

**Boring No./Test No.**

MW-52 T15

**Sheet**

1 of 1

**File No.**

41.0017869.01

**Project Location**

Indian Point

**Boring Coordinates**

N 463253.9453 E 604733.0454

**Date Start/End**

6/6/06

**Ground Surface Elev. (ft)**

16.77

**Datum**

NGVD 29

**Final Boring Depth (ft)**

193.0

**Diameter of Drilled Borehole**

3.83 inch

**Ground Water Depth (ft)**

14.00

**I.D. of Drilling Rods**

2 inch

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**Table: Test Interval**

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**Note:** Due to time constraints and low yield, full recovery could not be achieved at this interval.

---

**Legend:**

- **A:** Total Length of Test Section (ft)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

---

**Diagram:**

- **NITROGEN SUPPLY LINE**
- **FLOW RATE**
- **PACKER INFLATION PRESSURE**
- **GROUND SURFACE ELEVATION**
- **WATER FLOW DIRECTION**
- **INFLATABLE PACKERS**
- **PERFORATED PIPE**
- **BP**
- **TP**
- **A**
- **H1**
- **H2**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy Indian Point Energy Centre
Buchanan, NY

**Contractor**

Aquifer Drilling & Testing, Inc.

**Foreman**

Ed Borner

**GZA Eng.**

Sara Covelli

**Project Location**

Indian Point

**Boring No./Test No.**

MW-52 T15

**Sheet**

1 of 1

**File No.**

41.0017869.01
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client: Entergy
Indian Point Energy Centre
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Ed Borner
GZA ENG.: Sara Covelli

PROJECT LOCATION: Indian Point

BORING NO./TEST NO.: MW-52 T16

NOTE: Due to time constraints and low yield, full recovery could not be achieved at this interval.

LEGEND:
- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE

PACKER INFLATION PRESSURE
NITROGEN SUPPLY LINE
FLOW RATE
GROUND SURFACE ELEVATION
WATER FLOW DIRECTION
INFLATABLE PACKERS
PERFORATED PIPE

NOTE: Due to time constraints and low yield, full recovery could not be achieved at this interval.
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy

**Location:** Indian Point Energy Center

**Project:** Indian Point

---

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Paul Gaddis

**GZA ENG.:** Sara Covelli

**BOREDING NO./TEST NO.** MW-54 T1

**FILE NO.:** 41.0017869.01

**DATE:** 9/26/06

---

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 9.34 (below grade)

---

**I.D. OF DRILLING RODS:** 2 INCH

---

**TIME**

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---

**LEGEND:**

- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **HP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY

**NOTE:** Only the bottom packer was inflated for this test. The interval tested here may be considered from bottom of casing to 24.0 b/g.
## PACKER TEST LOG

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<tr>
<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (Δ T MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
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**Legend:**
- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

Client: Entergy Indian Point Energy Centre
Project Location: Indian Point

**Client:** Entergy Indian Point Energy Centre
**Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Paul Gaddis
**GZA Eng.:** Sara Covelli
**PACKER TEST LOG**

<table>
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<tr>
<th>Test Interval (FT)</th>
<th>Time (Hr:Min)</th>
<th>Elapsed Time (Δ Time)</th>
<th>Depth Under Water (FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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**LEGEND:**
- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packers and Assembly
- **BP**: Total Length of Bottom Packers and Assembly
- **D**: Distance between Ground Surface and Top of the Test Zone
- **PIP**: Packers inflation pressure (D PSI + 50 PSI)
- **H1**: Distance between Water Pressure Gauge and Ground Surface
- **H2**: Distance between Ground Surface and Ground Water Table

---

**Client**
- Entergy
- Indian Point Energy Centre
- Buchanan, NY

**GZA**
- GZGA Scientists and Engineers of New York
- GZA Engineering, Inc.

**Contractor**
- Aquifer Drilling & Testing, Inc.

**Foreman**
- Paul Gaddis

**GZA Engineering**
- Sara Covelli

**Project Location**
- Indian Point

**Coordinates**
- Boring Coordinates: N46°29'35.7461" E6°04'55.9223"

**Boring Depth**
- Final Boring Depth (FT): 206

**Ground Surface**
- Ground Surface EL (FT): 14.99

**Ground Water Depth**
- (Static Water Level Depth): 9.39 ft below grade

**Inflatable Packers**
- Diameter of Drilled Borehole: 3.83 inch

**Pipe**
- I.D. of Drilling Rods: 2 inch
# Packard Test Log

**Client:** Entergy Indian Point Energy Centre  
**Location:** Buchanan, NY

### Test Details

- **Boring No./Test No.:** MW-54 T4
- **Sheet:** 1 of 1
- **File No.:** 41.0017869.01
- **Project Location:** Indian Point

### Boring Coordinates

- **N Latitude:** 462935.7461
- **E Longitude:** 604551.9223
- **Ground Surface El. (FT):** 14.99
- **Datum:** NGVD 29

### Boring Details

- **Final Boring Depth (FT):** 206
- **Date Start/End:** 9/27/06

### Diameter of Drilled Borehole

- **Diameter:** 3.83 INCH

### I.D. of Drilling Rods

- **I.D.:** 2 INCH

### Ground Water Depth

- **Ground Water Depth:** 9.10 (below grade)
- **0.75 FT ground to casing**

### Perforated Pipe

- **Static Water Level Depth:**
  - **I.D. of Drilling Rods:** 2 INCH
  - **Packers Inflation Pressure:**
    - **(P):** 180 PSI
  - **Flow Rate:**
    - **(Q):** 0.95844

### Flow Rate

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<tr>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (ΔM)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
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### Legend:

- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

- **A:** 9.7 FT
- **TP:** 15.7 FT
- **BP:** 4.65 FT
- **D:** 44.8 FT
- **PP:** 180 PSI
- **H1:** 50.48 FT
- **H2:** 9.1 FT

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 Ninth Avenue, 18th Floor**
**New York, New York 10001**

**Scientists and Engineers**

**Entergy Indian Point Energy Centre**

**Buchanan, NY**

**LEGEND:**

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## PACKER TEST LOG

### Client
- Entergy
- Indian Point Energy Centre

### Project Location
- Buchanan, NY

### Contractor
- Aquifer Drilling & Testing, Inc.

### Foreman
- Paul Gaddis

### GZA Eng.
- Sara Covelli

### Diameter of Drilled Borehole
- 3.83 inch

### I.D. of Drilling Rods
- 2 inch

### Boring Coordinates
- N 462935.7461
- E 604551.9223

### Ground Surface EL.(FT)
- 14.99

### Datum
- NGVD 29

### Final Boring Depth (FT)
- 206

### Date Start/End
- 9/27/06

### Ground Water Depth
- 8.79 (below grade)
- 0.75 FT ground to casing

### Static Water Level Depth
- I.D. of Drilling Rods
- 2 inch

### Packers
- TP
- BP

### Perforated Pipe

### Flow Rate

### Nitrogen Supply Line

### Legend:
- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
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### Table

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<th>Tested Interval (from/to, ft)</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (Δ Min)</th>
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### Diagram

- NITROGEN SUPPLY LINE
- FLOW RATE
- WATER FLOW DIRECTION
- GROUND SURFACE ELEVATION
- WATER PRESSURE GAUGE
- GROUND WATER TABLE
- INFLATABLE PACKERS
- PERFORATED PIPE
## PACKER TEST LOG

### GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

### Client
Entergy Indian Point Energy Centre Buchanan, NY

### BORING COORDINATES
N 462935.7461 E 604551.9223

### DATE START/END
9/28/06 9/28/06

### PROJECT LOCATION
Indian Point

### CONTRACTOR
Aquifer Drilling & Testing, Inc.

### FOREMAN
Paul Gaddis

### GZA ENG.
Sara Covelli

### DIAMETER OF DRILLED BOREHOLE
3.83 INCH

### GROUND WATER DEPTH
9.12 (below grade) 0.75 FT ground to casing

### LEGEND:
- A - TOTAL LENGTH OF TEST SECTION (FT)
- BORING NO./TEST NO. MW-54 T6
- TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)

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<th>DEPTH TO WATER (FT)</th>
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### TIME WATER RECOVERY RATE (MIN) (GAL/FT)

### INFLATABLE PACKERS

### PERFORATED PIPE

### PACKER TEST LOG

### CLIENT
Entergy Indian Point Energy Centre Buchanan, NY

### PROJECT LOCATION
Indian Point
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client:**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Contractor:**  
Aquifer Drilling & Testing, Inc.

**Foreman:**  
Paul Gaddis  
GZA Eng. Sara Covelli

**GZA Eng.**

**Project Location:** Indian Point

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**Boring Coordinates:**  
N 462935.7461  
E 604551.9223

**Ground Surface EL. (FT):**  
14.99  
Datum: NGVD 29

**Final Boring Depth (FT):**  
206  
Date Start/End: 9/28/06

**Ground Water Depth:**  
9.34 (below grade)  
0.75 FT ground to casing

**Diameter of Drilled Borehole:**  
3.83 INCH

**I.D. of Drilling Rods:**  
2 INCH

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**Legend:**  
A - Total Length of Test Section (FT)  
B - Total Length of Bottom Packers and Assembly  
D - Distance between Ground Surface and Top of the Test Zone  
P - Packers Inflation Pressure (D PSI + 50 PSI)  
H1 - Distance between Water Pressure Gauge and Ground Surface  
H2 - Distance between Ground Surface and Ground Water Table

**NITROGEN SUPPLY LINE**

**FLOW RATE**

**WATER FLOW DIRECTION**

**GROUND SURFACE ELEVATION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**TOTAL LENGTH OF TEST SECTION (FT):**  
9.7 FT

**TOTAL LENGTH OF TOP PACKER AND ASSEMBLY:**  
15.7 FT

**TOTAL LENGTH OF BOTTOM PACKERS AND ASSEMBLY:**  
73.9 FT

**PACKER INFLATION PRESSURE:**  
180 PSI

**DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE:**  
79.33 FT

**DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE:**  
9.34 FT
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Centre  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Paul Gaddis

**GZA ENG.**  
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**I.D. OF DRILLING RODS**  
2 INCH

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<th>TIME (HR MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
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**LEGEND:**  
- **A:** TOTAL LENGTH OF TEST SECTION (FT)  
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  

**GZA**  
BORING NO./TEST NO. MW-54 T8
**Client**

Entergy
Indian Point Energy Center
Buchanan, NY

**Contractor**
Aquifer Drilling & Testing, Inc.

**Foreman**
Paul Gaddis

**GZA Eng.**
Sara Covelli

**Project Location**
Indian Point

**Boring No./Test No.**
MW-54 T9

**Sheet**
1 of 1

**File No.**
41.0017869.01

---

**Boring Coordinates**
N 462935.7461
E 604551.9223

**Ground Surface EL (FT)**
14.99

**Datum**
NGVD 29

**Final Boring Depth (FT)**
206

**Date Start/End**
9/28/06

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**Ground Water Depth**
8.89 (below grade) 0.75 FT ground to casing

**I.D. of Drilling Rods**
2 INCH

---

### PACKER TEST LOG

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<th>Interval</th>
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**Legend:**

- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
### PACKER TEST LOG

**Client:** Entergy Indian Point Energy Centre

**Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Paul Gaddis

**GZA Eng:** Sara Covelli

**Drilled Borehole Diameter:** 3.83 inch

**I.D. of Drilling Rods:** 2 inch

**Final Boring Depth:** 206 feet

**Date Start/End:** 9/29/06

**Ground Water Depth:** 9.04 feet (below grade) 0.75 feet ground to casing

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**Legend:**

- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PWP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

---

**Diagram:**

- **NP:** Nitrogen Supply Line
- **TP:** Top Packers
- **BP:** Bottom Packers
- **P:** Perforated Pipe
- **Q:** Flow Rate
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

---

**GZA GeoEnvironmental of New York**

**440 Ninth Avenue, 18th Floor New York, New York 10001**

**Scientists and Engineers**

**Entergy Indian Point Energy Centre Buchanan, NY**
## Packard Test Log

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Contractor
Aquifer Drilling & Testing, Inc.

### GZA Eng.
maya Covelli

### Boring No./Test No.
MW-54 T11

### Project Location
Indian Point

### Boring Coordinates
N 462935.7461 E 604551.9223

### Ground Surface El. (FT)
14.99

### Datum NGVD 29
9/29/06

### Ground Water Depth
9.19 (below grade)

### Diameter of Drilled Borehole
3.83 INCH

### Ground Water Depth (static water level depth)
0.75 FT ground to casing

### I.D. of Drilling Rods
2 INCH

### Packard Test Log

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<th>Depth Interval</th>
<th>Time</th>
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### Notes:
A constant head test was also run at this interval.

### Diagram
- **Legend:**
  - **A**: Total length of test section (FT)
  - **TP**: Total length of top packer and assembly
  - **BP**: Total length of bottom packer and assembly
  - **D**: Distance between ground surface and top of the test zone
  - **PIP**: Packager inflation pressure (D PSI + 50 PSI)
  - **H1**: Distance between water pressure gauge and ground surface
  - **H2**: Distance between ground surface and ground water table

### Mathematica
- **P**: Packager
- **Q**: NITROGEN SUPPLY LINE
- **GWT**: Ground water table
- **D**: Dist. between ground surface and top of test zone
- **TP**: Dist. between ground surface and top of test zone
## Packard Test Log

---

### General Information
- **Client:** Entergy
  - Indian Point Energy Center
  - Buchanan, NY
- **Contractor:** Aquifer Drilling & Testing, Inc.
- **GZA Engineer:** Sara Covelli
- **Boring No./Test No.:** MW-54 T11
- **File No.:** 41.0017869.01
- **Project Location:** Indian Point
- **Ground Surface EL (FT):** 14.99
- **Datum NGVD 29:**
- **GZ Coordinates:** N 462935.7461, E 604551.9223
- **Foreman:** Paul Gaddis
- **Final Boring Depth (FT):** 206
- **Date Start/End:** 9/29/06
- **I.D. of Drilling Rods:** 2 inch
- **Diameter of Drilled Borehole:** 3.83 inch
- **STATIC WATER LEVEL DEPTH:**
  - 0.75 FT manhole to casing
- **H2:**
- **H1:**
- **Packer Inflation Pressure:**
  - (D PSI + 50 PSI)
  - 180 PSI
- **Flow Rate:**
  - (gal/min)
  - Q/s
- **Specific Capacity:** (gpm) (Q/s)
- **Nitrogen Supply Line:**
- **Flow Rate:**
- **Ground Surface Elevation:**
- **Water Flow Direction:**
- **Inflatable Packers:**
- **Perforated Pipe:**
- **Total Length of Test Section (FT):**
  - L = 9.7 ft
- **Total Length of Top Packer and Assembly:**
  - TP = 15.7 ft
- **Total Length of Bottom Backer and Assembly:**
  - BP = 4.65 ft
- **Distance Between Ground Surface and Top of the Test Zone:**
  - D = 120.4 ft
- **Piper:**
  - (D PSI)
  - 125.8 ft
  - 9.19 ft

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### Notes
- A recovery test was also run at this interval.

---

**Legend:**
- A - Total Length of Test Section (FT)
- TP - Total Length of Top Packer and Assembly
- BP - Total Length of Bottom Backer and Assembly
- D - Distance Between Ground Surface and Top of the Test Zone
- PIP - Packer Inflation Pressure (D PSI + 50 PSI)
- H1 - Distance Between Water Pressure Gauge and Ground Surface
- H2 - Distance Between Ground Surface and Ground Water Table

---

**Note:**
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Project Location**  
Indian Point

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Paul Gaddis

**GZA Eng.**  
Sara Covelli

**Boring No./Test No.**  
MW-54 T12

**Date Start/End**  
9/29/06

**Ground Surface EL. (FT)**  
14.99  
(Datum NGVD 29)

**Final Boring Depth (FT)**  
206

**Ground Water Depth**  
9.25 (below grade)  
0.75 FT ground to casing

**I.D. of Drilling Rods**  
2 INCH

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<th>Elapsed Time (Δ MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
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**Legend:**
- A - Total Length of Test Section (FT)
- TP - Total Length of Top Packers and Assembly
- BP - Total Length of Bottom Packers and Assembly
- D - Distance Between Ground Surface and Top of the Test Zone
- PIP - Packerm Inflation Pressure (D PSI + 50 PSI)
- H1 - Distance Between Water Pressure Gauge and Ground Surface
- H2 - Distance Between Ground Surface and Ground Water Table

**note:**
A constant head test was also run at this interval.
### PACKER TEST LOG

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Paul Gaddis  
**GZA Eng.:** Sara Covelli  
**Project Location:** Indian Point

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<th>Pumping Rate (gpm)</th>
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**Legend:**  
- **A:** Total length of test section (ft)  
- **TP:** Total length of top packer and assembly  
- **BP:** Total length of bottom backer and assembly  
- **D:** Distance between ground surface and top of the test zone  
- **P:** Packers inflation pressure (psi)  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table

**Note:** A recovery test was also run at this interval.
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client**: Entergy
**Location**: Indian Point Energy Center
**Project Location**: Buchanan, NY

**Contractor**: Aquifer Drilling & Testing, Inc.
**Foreman**: Paul Gaddis
**GZA Eng.**: Sara Covelli

**Boring No./Test No.**: MW-54 T13

**Sheet**: 1 of 1
**File No.**: 41.0017869.01

**Ground Water Depth**: 9.14 ft (below grade)
**Ground Surface Elev.**: 14.99 ft
**Date Start/End**: 9/29/06

**Legend**:
- A: Total Length of Test Section (ft)
- TP: Total Length of Top Pack & Assembly
- BP: Total Length of Bottom Pack & Assembly
- D: Distance between Ground Surface and Top of the Test Zone
- PIP: Pack-Inflation Pressure (D PSI + 50 PSI)
- H1: Distance between Water Pressure Gauge and Ground Surface
- H2: Distance between Ground Surface and Ground Water Table

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<th>Elapsed Time (MIN)</th>
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**NOTE**: A constant head test was also run at this interval.
### PACKER TEST LOG

**Client:** Entergy  
**Project Location:** Indian Point  
**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Paul Gaddis  
**GZA Eng.:** Sara Covelli  
**Diameter of Drilled Borehole:** 3.83 inch  
**I.D. of Drilling Rods:** 2 inch

<table>
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<tr>
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<th>TIME (HR:MIN:SEC)</th>
<th>ELAPSED TIME (MIN)</th>
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</table>

**Legend:**

- **A:** Total length of test section (ft)  
- **TP:** Total length of top packer and assembly  
- **BP:** Total length of bottom backer and assembly  
- **D:** Distance between ground surface and top of the test zone  
- **PIP:** Packer inflation pressure (psi + 50 psi)  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table

**Note:** A recovery test was also run at this interval.

---

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 Ninth Avenue, 18th Floor  
New York, New York 10001  
Scientists and Engineers

---

**Project Location:** Indian Point  
**File No.:** 41.0017869.01  
**Sheet:** 1 of 1  
**Client:** Entergy  
**Date:** 9/29/06  
**Ground Surface Elev:** 14.99 ft  
**Ground Water Depth (from manhole):** 9.14 ft  
**Ground Water Depth (Static Water Level Depth):** 0.75 ft manhole to casing

---

**Diagram:**

- **P:** Pump
- **Q:** Flow rate
- **H2:** Ground surface elevation
- **GWT:** Ground water table
- **H1:** Water flow direction
- **TP:** Inflatable packers
- **BP:** Perforated pipe
- **D:** Distance between ground surface and ground water table
- **A:** Total length of test section (ft)
- **L:** Total length of top packer and assembly
- **BP:** Total length of bottom backer and assembly
- **D:** Distance between ground surface and top of the test zone
- **PIP:** Packer inflation pressure (psi + 50 psi)
- **H1:** Distance between water pressure gauge and ground surface
- **H2:** Distance between ground surface and ground water table

---

**Note:** A recovery test was also run at this interval.
### PACKER TEST LOG

**Client:** Entergy
**Location:** Indian Point Energy Centre, Buchanan, NY

**Client Information:**

- **Client:** Entergy
- **Location:** Indian Point Energy Centre, Buchanan, NY

**Test Information:**

- **Boring No./Test No.:** MW-54 T14
- **Sheet:** 1 of 1
- **File No.:** 41.0017869.01
- **Project Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Paul Gaddis

**GZA Eng.:** Sara Covelli

**Drilling Details:**

- **Diameter of Drilled Borehole:** 3.83 INCH
- **I.D. of Drilling Rods:** 2 INCH
- **Boring Coordinates:** N 462935.7461 E 604551.9223

**Ground Details:**

- **Ground Surface EL (FT):** 14.99
- **Datum:** NGVD 29
- **Final Boring Depth (FT):** 206
- **Date Start/End:** 10/2/06

**Water Details:**

- **Ground Water Depth:** 9.04 (below grade)
- **(Static Water Level Depth):** 0.75 FT ground to casing
- **Packer Inflation Pressure:** 190 PSI

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<th>Elapsed Time (MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
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**Legend:**

- **A:** Total Length of Test Section (FT)
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packer Inflation Pressure (50 PSI + D PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

**Values:**

- **A:** 15.7 FT
- **BP:** 4.65 FT
- **D:** 157.4 FT
- **PIP:** 190 PSI
- **H1:** 162.74 FT
- **H2:** 9.14 FT
## PACKER TEST LOG

### GZA GEOENVIRONMENTAL OF NEW YORK

440 Ninth Avenue, 18th Floor  
New York, New York 10001  
Scientists and Engineers

| Client | Entergy  
|--------|--------|
|        | Indian Point Energy Center  
|         | Buchanan, NY |

### CONTRACTOR

Aquifer Drilling & Testing, Inc.

### FOREMAN

Paul Gaddis

### GZA ENG.

Sara Covelli

### DIAMETER OF DRILLED BOREHOLE

3.83 inch

### BORING COORDINATES

N 462935.7461  E 604551.9223

### GROUND SURFACE EL. (FT)

14.99

### FINAL BORING DEPTH (FT)

206

### DATE START/END

10/2/06

### GROUND WATER DEPTH

9.17 (below grade) 0.75 FT ground to casing

### I.D. OF DRILLING RODS

2 inch

### TIME ELAPSED DEPTH TO CUMULATIVE RECOVERY

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<th>DEPTH TO WATER (FT)</th>
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### LEGEND:

- **A**: Total length of test section (FT)
- **TP**: Total length of top packer and assembly
- **BP**: Total length of bottom packer and assembly
- **D**: Distance between ground surface and top of the test zone
- **P**: Packer inflation pressure (D psi + 50 psi)
- **H1**: Distance between water pressure gauge and ground surface
- **H2**: Distance between ground surface and ground water table

### NOTE:

A constant head test was also run at this interval.

---

GZA

BORING NO./TEST NO. MW-54 T15
## PACKER TEST LOG

**Client:** Entergy  
**Location:** Indian Point Energy Center, Buchanan, NY  
**Contractor:** Aquifer Drilling & Testing, Inc.  
**Engineer:** Sara Covelli  
**Foreman:** Paul Gaddis  
**Date Start/End:** 10/2/06  
**File No.:** 41.0017869.01

### Boring Coordinates
- **N:** 462935.7461
- **E:** 604551.9223
- **Datum:** NGVD 29

### Ground Water Depth
- **From Manhole:** 9.17 ft
- **Manhole to Casing:** 0.75 ft

### Static Water Level Depth
- **Time Elapsed:** 0 156.362 21.24 12.068 2.500 0.207
- **Time Water Drawdown Rate:** 1 154.474 23.13 13.956 2.500 0.179
- **Time Elapsed:** 2 154.041 23.56 14.389 2.250 0.156
- **Time Elapsed:** 3 153.825 23.78 14.605 2.250 0.154
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- **Time Elapsed:** 8 153.595 24.01 14.835 2.250 0.152
- **Time Elapsed:** 9 153.522 24.08 14.908 2.250 0.151
- **Time Elapsed:** 10 153.479 24.12 14.951 2.250 0.150
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- **Time Elapsed:** 27 153.220 24.38 15.21 2.250 0.148
- **Time Elapsed:** 28 153.220 24.38 15.21 2.250 0.148

### Legend:
- **A:** To The Surface
- **BP:** Total Length of Bottom Backer and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
- **L:** 9.7 ft
- **P:** Nitrogen Supply Line
- **Q:** Flow Rate
- **T:** Total Length of Top Packers and Assembly
- **TP:** Total Length of Top Backer and Assembly

**Note:** A recovery test was also run at this interval.
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy Indian Point Energy Center  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Paul Gaddis

**GZA ENG.**  
Sara Covelli

**DIAMETER OF DRILLED BOREHOLE** 3.83 INCH

**I.D. OF DRILLING RODS** 2 INCH

<table>
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<tr>
<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
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**NOTE:** Only the top packer was inflated for this test. The interval tested here may be considered from 182.0 ft b/g to the bottom of the well (206 ft b/g).

A constant head test was also run at this interval.

**LEGEND:**
- **A** - Total length of test section (ft)
- **TP** - Total length of top packer and assembly
- **BP** - Total length of bottom packer and assembly
- **D** - Distance between ground surface and top of the test zone
- **PI** - Pack Drift
- **G** - Drift (δ PSI)
- **H1** - Distance between water pressure gauge and ground surface
- **H2** - Distance between ground surface and ground water table

**INFLATABLE PACKERS**

---

**TEMPERATURE:**

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**GROUND WATER TABLE**

---

**GZA ENG.**

**BORING NO./TEST NO.** MW-54 T16

---

**FILE NO.** 41.0017869.01

---

**PROJECT LOCATION** Indian Point
### PACKER TEST LOG

**Client:** Enery

**Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Paul Gaddis

**Engineer:** Sara Covelli

**Boring No./Test No.:** MW-54 T16

**Date:** 10/2/06

**Ground Surface EL.(FT):** 14.99

**Ground Water Depth:**
- From manhole: 9.55 FT
- Manhole to casing: 0.75 FT

**Boring Coordinates:**
- Latitude: N 46° 29' 57.2"
- Longitude: E 80° 45' 51.2"

**Final Boring Depth (FT):** 206

**Diameter of Drilled Borehole:** 3.83 IN

**I.D. of Drilling Rods:** 2 IN

<table>
<thead>
<tr>
<th>Interval</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (HR:MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Drawdown (FT)</th>
<th>Pumping Rate (gpm)</th>
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</table>

**Legend:**
- **A:** Total length of test section (FT)
- **BP:** Total length of bottom backer and assembly
- **BP:** Total length of top packer and assembly
- **D:** Distance between ground surface and top of the test zone
- **BP:** Packers inflation pressure (psi + 50 psi)
- **H1:** Distance between water pressure gauge and ground surface
- **H2:** Distance between ground surface and ground water table

**Note:** A recovery test was also run at this interval.

**GZA GEOENVIRONMENTAL OF NEW YORK**

科学咨询和工程师
# PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client**
Entergy Indian Point Energy Center
Buchanan, NY

**Project Location**
Indian Point

**Contractor**
Aquifer Drilling & Testing, Inc.

**Foreman**
Paul Gaddis

**GZA Eng.**
Sara Covelli

**Boring No./Test No.**
MW-54 T17

**File No.**
410017869.01

**Sheet**
1 of 1

---

## Client Information

- **440 Ninth Avenue, 18th Floor**
- **New York, New York 10001**

---

## Boring Coordinates

- **N** 462935.7461
- **E** 604551.9223

## Ground Surface El. (FT)

- **14.99**

## GND Water Depth

- **9.22** (below grade)
- **0.75** FT ground to casing

## Diameter of Drilled Borehole

- **3.83** Inch

## I.D. of Drilling Rods

- **2** Inch

---

## Test Interval Log

<table>
<thead>
<tr>
<th>Time</th>
<th>Depth Under Water (FT)</th>
<th>Cumulative Recovery Rate (ΔH/Δt)</th>
<th>Recovery Rate (ΔH/Δt)</th>
<th>Flow Rate (Q)</th>
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</table>

---

## Legend

- **A**: Total Length of Test Section (FT)
- **TP**: Total Length of Top Packer and Assembly
- **BP**: Total Length of Bottom Packer and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Packer Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table

---

**Note:**
- Only the top packer was inflated for this test. The interval tested here may be considered from 187.0 ft b/g to the bottom of the well (206 ft b/g).
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CONTRACTOR** Aquifer Drilling & Testing, Inc.
**FOREMAN** Dave Carter
**GZA ENG.** Sara Covelli

**PROJECT LOCATION** Indian Point

**DIAMETER OF DRILLED BOREHOLE** 3.83 INCH

<table>
<thead>
<tr>
<th>TESTED INTERVAL</th>
<th>TIME</th>
<th>ELAPSED TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/ΔT)</th>
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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**NOTE:** Only the top packer was inflated for this test. The interval tested here may be considered from 188.2’ b/g to bottom of well.

**GZA**

BORING NO./TEST NO. MW-60 T1
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**BORING NO./TEST NO.**
MW-60 T2

**PROJECT LOCATION**
Indian Point

---

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Sara Covelli

---

**BOARING COORDINATES**

N 463382.5093
E 604586.4889

**GROUND SURFACE EL.(FT)**
14.31

**FINAL BORING DEPTH (FT)**
202

**DATE START/END**
12/7/06

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**GROUND WATER DEPTH**
11.95 (below grade)

**I.D. OF DRILLING RODS**
2 INCH

---

**TIME**

<table>
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<tr>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (D Min)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (AH FT)</th>
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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT) = 9.7 FT
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY = 15.7 FT
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = 4.65 FT
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 172.3 FT
- **PIP** - PACKER INFLATION PRESSURE (D PSI +50 PSI) = 180 PSI
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE = 177.6 FT
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 11.95 FT

**NOTE:** Upon packer inflation, Below Zone transducer pressure increased to 241+ ft/water. High connectivity between Below Zone and In Zone was observed during pumping and recovery. Integrity of bottom packer was verified by deflating top packer and discontinuing air pressure on bottom packer. Pressure within bottom packer maintained 180psi. Drill rig winch line holding packer assembly was also slackened to verify integrity of bottom packer.

---

**GZA**
BORING NO./TEST NO. MW-60 T2
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client
Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR
Aquifer Drilling & Testing, Inc.

FOREMAN
Dave Carter

GZA ENG.
Sara Covelli

PROJECT LOCATION
Indian Point

DIAMETER OF DRILLED BOREHOLE
3.83 INCH

GROUND WATER DEPTH
13.90 (below grade) 1.83 FT ground to casing

I.D. OF DRILLING RODS
2 INCH

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**: Aquifer Drilling & Testing, Inc.
**FOREMAN**: Dave Carter
**GZA ENG.**: Sara Covelli

**PROJECT LOCATION**: Indian Point

**BORING NO./TEST NO.**: MW-60 T4
**FILE NO.**: 41.0017869.01
**SHEET**: 1 of 1

**BORING COORDINATES**
N 463382.5093 E 604586.4889
**DATE START/END**: 12/11/06

**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH
**GROUND WATER DEPTH**: 13.48 (below grade) 1.83 FT ground to casing
**I.D. OF DRILLING RODS**: 2 INCH

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**LEGEND**

- A: TOTAL LENGTH OF TEST SECTION (FT)
- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

- 9.7 FT
- 15.7 FT
- 4.65 FT
- 151.3 FT
- 190 PSI
- 156.7 FT
- 13.48 FT
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**

**Client**

Entergy
Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Sara Covelli

**PROJECT LOCATION**

Indian Point

**BORING NO./TEST NO.**

MW-60 T5

**FILE NO.**

41.0017869.01

**DATE START/END**

12/11/06

**GROUND WATER DEPTH**

12.80 (below grade)

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

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<tr>
<th>TESTED INTERVAL</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
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**LEGEND:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (PSI)
- H1 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**FLOW RATE**

**NITROGEN SUPPLY LINE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**GZA GEOSCIENCE OF NEW YORK**

Buchanan, NY

**Indian Point Energy Centre**

**ENTEGRO**
## PACKER TEST LOG

### GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### CONTRACTOR
Aquifer Drilling & Testing, Inc.

### FOREMAN
Dave Carter

### GZA ENG.
Sara Covelli

### DIAMETER OF DRILLED BOREHOLE
3.83 INCH

### I.D. OF DRILLING RODS
2 INCH

### PROJECT LOCATION
Indian Point

### BORING NO./TEST NO.
MW-60 T6

### SHEET
1 of 1

### FILE NO.
41.0017869.01

### PROJECT LOCATION
Indian Point

### BORING COORDINATES
N 463382.5093 E 604566.4889

### DATE START/END
12/12/06

### GROUND WATER DEPTH
13.20 (below grade) 1.83 FT ground to casing

### TIME ELAPSED DEPTH TO CUMULATIVE REcovery

<table>
<thead>
<tr>
<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME</th>
<th>ELAPSED TIME (HR MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (Q)</th>
<th>RECOVERY RATE (Q/A)</th>
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### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT) = 9.7 FT
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY = 4.65 FT
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE = 115.3 FT
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE = 120.8 FT
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE = 13.20 FT

### WATER FLOW DIRECTION

---

GZA GEOENVIRONMENTAL OF NEW YORK

Buckinghan, NY

Indian Point

Indian Point Energy Center

Boring No./Test No. MW-60 T6
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Borong No./Test No.**  
MW-60 T7

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Dave Carter

**Gza Eng.**  
Sara Covelli

**Project Location**  
Indian Point

**Boring Coordinates**  
N 463382.5093  
E 604586.4889

**Final Boring Depth (ft)**  
202

**Ground Surface El. (FT)**  
14.31

**Date Start/End**  
12/12/06

**Ground Water Depth**  
13.65 (below grade)  
1.83 FT ground to casing

**Diameter of Drilled Borehole**  
3.83 INCH

**I.D. of Drilling Rods**  
2 INCH

**Tested Interval**  
99.3'-109.0'

<table>
<thead>
<tr>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (DI MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>Cumulative Recovery (qFt)</th>
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</table>

**Legend:**  
- **A** - Total Length of Test Section (FT)  
- **BP** - Total Length of Bottom Packers and Assembly  
- **D** - Distance Between Ground Surface and Top of the Test Zone  
- **H1** - Distance Between Water Pressure Gauge and Ground Surface  
- **H2** - Distance Between Ground Surface and Ground Water Table  
- **TP** - Total Length of Top Packers and Assembly  
- **P** - Packers  
- **Q** - Sarin  
- **L** - Nitrogen Supply Line  
- **W** - Water Flow Direction  
- **G** - Ground Surface Elevation  
- **V** - Packers  
- **X** - Perforated Pipe  
- **Y** - Inflatable Packers  

---

**Packers**  
- TP  
- BP  

**Tested Interval**  
99.3'-109.0'

**Flow Rate**  
From / To (FT)

**Interval**  
Tested Depth Underwater (FT)

**Cumulative Recovery**  
(Dq F)  
Recovery Rate (Dq/d)
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Dave Carter

**GZA ENG.**  
Sara Covelli

**PROJECT LOCATION**  
Indian Point

#### BORING COORDINATES

- **N** 463382.5093  
- **E** 604586.4889  
- **DATE** NOVD 29  
- **NO.** 202  
- **DATE START/END** 12/12/06

#### DIAMETER OF DRILLED BOREHOLE

- **3.83 INCH**

#### GROUND WATER DEPTH

- **14.00 (below grade)**
- **1.83 FT ground to casing**

#### I.D. OF DRILLING RODS

- **2 INCH**

#### PACKER TEST LOG

<table>
<thead>
<tr>
<th>Tested Interval</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (ΔT MIN)</th>
<th>Depth Under Water (FT)</th>
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- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**LEGEND:**

- **9.7 FT**
- **15.7 FT**
- **4.65 FT**
- **88.3 FT**
- **180 PSI**
- **93.855 FT**
- **14.00 FT**
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client:** Entergy  
**Project Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

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<th>Client</th>
<th>Entergy</th>
<th>Indian Point Energy Center</th>
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**Foreman:** Dave Carter  
**Ground Surface EL (FT):** 14.31  
**Date Start/End:** 12/13/06

**Boring Coordinates (N):** 463382.5093  
**Datum:** NGVD 29

**Final Boring Depth (FT):** 202

**Boring No./Test No.:** MW-60 T9

**Sheet:** 1 of 1  
**File No.:** 41.0017869.01

**Diameter of Drilled Borehole:** 3.83 INCH  
**Ground Water Depth:** 12.25 (below grade), 1.83 FT ground to casing

**I.D. of Drilling Rods:** 2 INCH

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**Legend:**  
- **A:** Total Length of Test Section (FT)  
- **TP:** Total Length of Top Packers and Assembly  
- **BP:** Total Length of Bottom Packers and Assembly  
- **D:** Distance Between Ground Surface and Top of the Test Zone  
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)  
- **H1:** Distance Between Water Pressure Gauge and Ground Surface  
- **H2:** Distance Between Ground Surface and Ground Water Table

**NITROGEN SUPPLY LINE**  
**FLOW RATE**  
**GROUND SURFACE ELEVATION**  
**GROUND WATER DEPTH**  
**WATER FLOW DIRECTION**  
**INFLATABLE PACKERS**  
**PERFORATED PIPE**

---

**Boring No./Test No.:** MW-60 T9  
**File No.:** 41.0017869.01

---

**LEGEND:**  
- **A:** Total Length of Test Section (FT)  
- **TP:** Total Length of Top Packers and Assembly  
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- **D:** Distance Between Ground Surface and Top of the Test Zone  
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)  
- **H1:** Distance Between Water Pressure Gauge and Ground Surface  
- **H2:** Distance Between Ground Surface and Ground Water Table
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter
GZA ENG.: Sara Covelli

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
I.D. OF DRILLING RODS: 2 INCH
GROUND WATER DEPTH: 13.13 FT (below grade)

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LEGEND:
- A: TOTAL LENGTH OF TEST SECTION (FT)
- TP: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- L: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
## PACKER TEST LOG

**Client:** Entergy Indian Point Energy Center  
**Location:** Buchanan, NY

### CONTRACTOR
Aquifer Drilling & Testing, Inc.

### FOREMAN
Dave Carter

### GZA ENG.
Sara Covelli

### BORING NO./TEST NO.
MW-60 T11

### SHEET
1 of 1

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Indian Point

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### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)  
  - **B** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
  - **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
  - **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
  - **IP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
  - **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
  - **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  

### GZA GEOENVIRONMENTAL OF NEW YORK
440 Ninth Avenue, 18th Floor  
New York, New York 10001  
Scientists and Engineers
PACKER TEST LOG

GZA GEOMEMBRANEAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Entergy
Indian Point Energy Center
Buchanan, NY

BORING NO./TEST NO. MW-60 T12
 Client

BOARING COORDINATES
N 46382.5093 E 60456.4889

CONTRACTOR Aquifer Drilling & Testing, Inc.
FOREMAN Dave Carter
GZA ENG. Sara Covelli

GROUND SURFACE EL.(FT) 14.31
DATUM NGVD 29

PROJECT LOCATION Indian Point

DIAMETER OF DRILLED BOREHOLE 3.83 INCH
I.D. OF DRILLING RODS 2 INCH

FINAL BORING DEPTH (FT) 202
DATE START/END 12/13/06

GROUND WATER DEPTH 13.57 (below grade) 1.83 FT ground to casing

NOTES:
The tested interval begins at the bottom of the well casing (10.2 ft b/g) and ends at 29.0 ft b/g.
Above zone transducer for this test was not installed until 14:35, after packers were inflated. During drawdown and recovery for this test, top packer was used only as a secondary source of data for In Zone transducer. Water level was drawn below AZ transducer.
At time of packer inflation, both packers were inflated. At 14:41, pump was run at 1.25 gpm to test connectivity between the intervals 19.3'-29.0' b/g and 10.2'-19.3' b/g. No connectivity was observed. Pump was turned off at 14:42 and top packer was deflated at 14:45.
After 3/4 hour, less than 0.3' recovery was observed at this test interval. "Recovery" sample was not taken for this test interval.

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
P - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

10.2-29.0'
14:50:00 0.0 3.158 22.14 0.00 -
14:51:00 1.0 3.158 22.14 0.00 0.00000
14:52:00 2.0 3.172 22.13 0.01 0.00700
14:53:00 3.0 3.244 22.06 0.09 0.02867
14:54:00 4.0 3.273 22.03 0.11 0.02875
14:55:00 5.0 3.287 22.01 0.13 0.02580
15:00:00 10.0 3.258 22.04 0.10 0.01000
15:05:00 15.0 3.244 22.06 0.09 0.00573
15:10:00 20.0 3.258 22.04 0.10 0.00500
15:15:00 25.0 3.287 22.01 0.13 0.00516
15:20:00 30.0 3.330 21.97 0.17 0.00573

17.8 FT
15.7 FT
4.65 FT
1.2 FT
180 PSI
25.3 FT
13.57 FT
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

---

**Client**  
Entergy Indian Point Energy Center  
Buchanan, NY

---

**Boring No./Test No.**  
MW-62 T1

---

**Sheet**  
1 of 1

---

**File No.**  
41.0017869.01

---

**Project Location**  
Indian Point

---

**Contractor**  
Aquifer Drilling & Testing, Inc.

---

**Boring Coordinates**  
N 463087.4034  
E 604349.9123

---

**Ground Surface EL (FT)**  
14.69 DATUM NGVD29

---

**Final Boring Depth (FT)**  
202

---

**Date Start/End**  
12/19/06

---

**Diameter of Drilled Borehole**  
3.83 INCH

---

**Ground Water Depth**  
11.48 (below grade)  
1.87 FT ground to casing

---

**I.D. of Drilling Rods**  
2 INCH

---

**Packers Test Level**

<table>
<thead>
<tr>
<th>Test Interval</th>
<th>Time</th>
<th>Elapsed Time</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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**Legend:**

- A: Total Length of Test Section (FT)  
  = 13.9 FT
- TP: Total Length of Top Packers and Assembly  
  = 15.7 FT
- BP: Total Length of Bottom Packers and Assembly  
  = 4.65 FT
- D: Distance Between Ground Surface and Top of the Test Zone  
  = 186.6 FT
- PIP: Packers Inflation Pressure (D PSI+50 PSI)  
  = 180 PSI
- H1: Distance Between Water Pressure Gauge and Ground Surface  
  = 188.1 FT
- H2: Distance Between Ground Surface and Ground Water Table  
  = 11.48 FT

**Note:** Only the top packer was inflated for this test. The interval tested here may be considered from 186.6’ b/g to bottom of well.

---

**GZA**
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CLIENT**
Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Sara Covelli

**DIA. OF DRILLED BOREHOLE**
3.83 INCH

**GROUND WATER DEPTH (STATIC WATER LEVEL DEPTH)**
12.35 (below grade)

**I.D. OF DRILLING RODS**
2 INCH

**TESTED INTERVAL FROM TO (FT)**

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<tr>
<th>TIME</th>
<th>ELAPSED TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (QH FT)</th>
<th>RECOVERY RATE (QH/QT)</th>
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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIF** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**GZA**

BORING NO./TEST NO. MW-62 T2
## PACKER TEST LOG

**Client**  
Entergy Indian Point Energy Cente  
Buchanan, NY

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Dave Carter

**GZA Eng.**  
Sara Covelli

**PROJECT LOCATION**  
Indian Point

**BORING NO./TEST NO.**  
MW-62 T3

**DETAILED DRILLING LOG**

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<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY ((\Delta H) FT)</th>
<th>RECOVERY RATE ((\Delta H / \Delta t))</th>
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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)  = 9.7 FT
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  = 15.7 FT
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  = 4.65 FT
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  = 167.7 FT
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
  - **H1** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  = 170.4 FT
  - **H2** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  = 12.20 FT

**NITROGEN SUPPLY LINE**

**FLOW RATE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**GZA**

---

**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **H2** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

---

**FILE NO.**  
41.0017669.01

**DATE**  
12/19/06

---

**GROUND WATER DEPTH**

- **12.20 FT** (below grade)
- **1.87 FT** ground to casing
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Enery  
Indian Point Energy Centre  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Dave Carter

**GZA ENG.**  
Sara Covelli

**PROJECT LOCATION**  
Indian Point

**BOARING NO./TEST NO.**  
MW-62 T5

**FILE NO.**  
41.0017869.01

**DATE START/END**  
12/19/06

---

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**GROUND WATER DEPTH**  
12.50 FT (below grade)  
1.87 FT ground to casing

**I.D. OF DRILLING RODS**  
2 INCH

---

**TESTED INTERVAL**  
FROM / TO (FT)

**TIME**  
(HR:MIN)

**ELAPSED TIME**  
(ΔT MIN)

**DEPTH UNDER WATER (FT)**  

**DEPTH TO WATER (FT)**  

**CUMULATIVE RECOVERY (ΔH FT)**  

**RECOVERY RATE (ΔH/ΔT)**  

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<tr>
<th>Time (HR:MIN)</th>
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<th>Depth To Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
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---

**LEGEND:**  
A - TOTAL LENGTH OF TEST SECTION (FT)  
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
INFLATABLE PACKERS  
PERFORATED PIPE  
GWT - GROUND WATER TABLE  
H1 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  
H2 - DISTANCE BETWEEN GROUND PRESSURE GAUGE AND GROUND SURFACE  
P - NITROGEN SUPPLY LINE  
Q - FLOW RATE  
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  

---

9.7 FT  
15.7 FT  
4.65 FT  
146.9 FT  
180 PSI  
149.6 FT  
12.50 FT  

---

**GZA GEOENVIRONMENTAL OF NEW YORK**
### PACKER TEST LOG

#### Client Information
- **Client:** Entergy
- **Location:** Indian Point Energy Center, Buchanan, NY
- **Site Address:** 440 Ninth Avenue, 18th Floor, New York, NY 10001
- **File No.:** 41.0017869.01

#### Geotechnical Information
- **Project Location:** Indian Point
- **Contractor:** Aquifer Drilling & Testing, Inc.
- **Boring No./Test No.:** MW-62 T6
- **Boring Coordinates:** N 46°30'47.4034" E 6°04'34.9123"
- **Ground Surface Elevation (HFT):** 14.69 ft
- **Datum:** NGVD 29
- **Final Boring Depth (HFT):** 202 ft
- **Date Start/End:** 12/21/06

#### Drilling Specifications
- **Boring No./Test No.:** MW-62 T6
- **File No.:** 41.0017869.01
- **Location:** Indian Point

#### Boring Details
- **Coordinates (N, E):** N 46°30'47.4034" E 6°04'34.9123"
- **Final Boring Depth:** 202 ft
- **Ground Surface Elevation:** 14.69 ft
- **Ground Water Depth:** 13.20 ft
- **Drilled Borehole Diameter:** 3.83" (inches)
- **Drill Rod Diameter:** 2" (inches)

#### Test Data

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<th>Depth Interval (HFT)</th>
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#### Diagram Legend
- **A:** Total Length of Test Section (FT)
- **BP:** Total Length of Bottom Packers and Assemblies (FT)
- **D:** Distance Between Ground Surface and Top of the Test Zone (FT)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface (FT)
- **H2:** Distance Between Ground Surface and Ground Water Table (FT)
- **GWT:** Ground Water Table (FT)
- **GSP:** Ground Surface Elevation (FT)
- **IF:** Inflatable Packers
- **TP:** Total Length of Top Packers and Assemblies (FT)

#### Additional Notes
1. Nitrogen Supply Line
2. Flow Rate
3. Packers Inflation Pressure
4. Water Flow Direction

---

GZA GEOENVIRONMENTAL OF NEW YORK

440 Ninth Avenue, 18th Floor
New York, New York 10001

Scientists and Engineers

Entergy Indian Point Energy Center
Buchanan, NY
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter

GZA ENG.: Sara Covelli

PROJECT LOCATION: Indian Point

CONTRACTOR BORING NO./TEST NO. MW-62 T7

SHEET: 1 of 1
FILE NO.: 41.0017869.01
PROJECT LOCATION: Indian Point

BORING COORDINATES
N 463087.4034
E 604 349.9123

DATE START/END: 12/21/06

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH

GZA GEOENVIRONMENTAL OF NEW YORK

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Dave Carter

**GZA ENG.**  
Sara Covelli

**PROJECT LOCATION**  
Indian Point

**BORING NO./TEST NO.**  
MW-62 T8

**FILE NO.**  
41.0017869.01

**SHEET**  
1 of 1

**CLIENT BORING NO./TEST NO.**  
MW-62 T8

**GROUND SURFACE EL.(FT)**  
14.69

**DATE START/END**  
12/21/06

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**GROUND WATER DEPTH**  
13.26 (below grade) 1.87 FT ground to casing

**I.D. OF DRILLING RODS**  
2 INCH

---

### PACKER TEST LOG

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**LEGEND:**  
- **A:** TOTAL LENGTH OF TEST SECTION (FT)  
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter

GROUND SURFACE EL (FT): N 463087.4034
E 604345.9123

FINAL BORING DEPTH (FT): 202

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 13.04 (below grade) 1.87 FT ground to casing

I.D. OF DRILLING RODS: 2 INCH

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LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

GZA
BORING NO./TEST NO. MW-62 T9

FILE NO. 41.0017869.01
PROJECT LOCATION Indian Point
## PACKER TEST LOG

### Client Information
- **Client:** Entergy Indian Point Energy Center
- **Address:** Buchanan, NY
- **Project Location:** Indian Point

### Contractor Information
- **Contractor:** Aquifer Drilling & Testing, Inc.
- **Foreman:** Dave Carter

### Boring Details
- **Boring No./Test No.:** MW-62 T10
- **File No.:** 41.0017869.01
- **Site Address:** 440 Ninth Avenue, 18th Floor, New York, NY 10001

### Boring Coordinates
- **Coordinates:**
  - N: 463087.4034 m
  - E: 604349.9123 m
- **Datum:** NGVD 29

### Ground Surface Depth
- **Ground Surface Elevation (ft):** 14.69
- **Ground Water Depth (below grade):** 13.10 ft
- **Ground Water Depth (Static Water Level Depth):** 1.87 ft

### Drilling Details
- **Diameter of Drilled Borehole:** 3.83 inch
- **I.D. of Drilling Rods:** 2 inch
- **Static Water Level Depth:**
  - **Interval:** 80.3-90.0'
  - **Flow Rate:** 0.40 ft³/min

### Water Flow Direction
- **Water Flow Direction:**
  - **Ground Surface Elevation:**
    - **Interval:** 80.3-90.0'
    - **Flow Rate:** 0.40 ft³/min
  - **Ground Water Depth:**
    - **Interval:** 80.3-90.0'
    - **Flow Rate:** 0.40 ft³/min

### Table of Test Results

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<th>Elapsed Time (MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
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### Legend
- **A:** Total Length of Test Section (FT)
- **B:** Total Length of Bottom Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **GWT:** Ground Water Table
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
- **L:** Total Length of Test Section (FT)
- **N:** Nitrogen Supply Line
- **P:** Perforated Pipe
- **Q:** Inflatable Packers
- **TP:** Total Length of Top Packers and Assembly

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 Ninth Avenue, 18th Floor
New York, New York 10001

**Scientists and Engineers**

Entergy Indian Point Energy Center Buchanan, NY

**Project Location:** Indian Point

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**BORING NO./TEST NO.:** MW-62 T10
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter
GZA ENG. Sara Covelli

PROJECT LOCATION: Indian Point

BORING NO./TEST NO.: MW-62 T11
FILE NO.: 41.0017869.01
PROJECT LOCATION: Indian Point

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 13.72 FT (below grade)

I.D. OF DRILLING RODS: 2 INCH

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
B - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
H1 - DISTANCE BETWEEN WATER PRESSUREGAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
L= 9.7 ft
TP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)

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PACKER INFLATION PRESSURE:

NITROGEN SUPPLY LINE:

FLOW RATE:

GROUND SURFACE ELEVATION:

WATER FLOW DIRECTION:

INFLATABLE PACKERS:

PERFORATED PIPE:

BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
L= 9.7 ft
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA SCIENTISTS AND ENGINEERS

Indian Point Energy Center
Buchanan, NY

Entergy
Indian Point Energy Centre
Buchanan, NY
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy

**Location:** Indian Point Energy Centre, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Dave Carter

**GZA ENG.:** Sara Covelli

**Boring No./Test No.:** MW-62 T12

**Sheet:** 1 of 1

**File No.:** 41.0017869.01

**Project Location:** Indian Point

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**Legend:**

- **A** - Total Length of Test Section (FT)
- **TP** - Total Length of Top Packers and Assembly
- **BP** - Total Length of Bottom Packers and Assembly
- **D** - Distance Between Ground Surface and Top of Test Zone
- **PIP** - PACKER INFLATION PRESSURE (D PSI+50 PSI)
- **H1** - Distance Between Water Pressure Gauge and Ground Surface
- **H2** - Distance Between Ground Surface and Ground Water Table
- **9.7 FT**
- **15.7 FT**
- **4.65 FT**
- **51.3 FT**
- **180 PSI**
- **54.5 FT**
- **15.08 FT**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

SCIENTISTS AND ENGINEERS

Entergy

Indian Point Energy Centre

Buchanan, NY

**Boring No./Test No.:** MW-62 T12

**File No.:** 41.0017869.01

**Project Location:** Indian Point

---

**LEGEND:**

- **A** - Total Length of Test Section (FT)
- **TP** - Total Length of Top Packers and Assembly
- **BP** - Total Length of Bottom Packers and Assembly
- **D** - Distance Between Ground Surface and Top of the Test Zone
- **PIP** - Packers Inflation Pressure (D PSI + 50 PSI)
- **H1** - Distance Between Water Pressure Gauge and Ground Surface
- **H2** - Distance Between Ground Surface and Ground Water Table
### Packert Test Log

**Client:** Enerygy
**Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Dave Carter
**Eng.:** Sara Covelli

**Boring No.:** MW-62
**Test No.:** T13

**Date:** 12/22/06

**Boring Coordinates:**
- N 463087.4034
- E 604349.9123

**Ground Surface El (ft):** 14.69
**Datum:** NGVD 29

**Final Boring Depth (ft):** 202

**Ground Water Depth:** 13.49 ft (below grade)
**Ground Water Depth (static water level depth):** 1.87 ft

**Drilled Borehole Diameter:** 3.83 inch
**ID of Drilling Rods:** 2 inch

**Notes:**
- The tested interval begins at the bottom of the well casing (40.5 ft b/g) and ends at 49.0 ft b/g. Only the bottom packer was inflated for this interval.
- After 1/2 hour, no recovery was observed at this test interval. "Recovery" sample was not taken for this test interval.

<table>
<thead>
<tr>
<th>Tested Interval</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (ΔT MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/ΔT)</th>
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</table>

**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packer and Assembly
- **BP:** Total Length of Bottom Packer and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **P:** Packer Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

**Flow Rate:**

**Flow Rate:**
### PACKER TEST LOG

**Client:** Entergy  
**Location:** Indian Point Energy Center, Buchanan, NY  
**Date:** 10/11/06

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter

**Boring No./Test No.:** MW-63 T1  
**Coordinates:** N 462970.4209 E 604251.2759

**Final Boring Depth (FT):** 201  
**Ground Water Depth:** 12.46 FT (below grade), 1.83 FT ground to casing

**GZA Engagement:** Sara Covelli

**I.D. of Drilled Borehole:** 3.83 INCH  
**Diameter of Drilling Rods:** 2 INCH

<table>
<thead>
<tr>
<th>TIME FROM / TO (FT)</th>
<th>ELAPSED TIME (HR:MIN:SEC)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (ΔH FT)</th>
<th>PUMPING RATE (gal/min)</th>
<th>SPECIFIC CAPACITY (gpm/ft)</th>
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**LEGEND:**  
A - Total Length of Test Section (FT) = 14.5 FT  
TP - Total Length of Top Packers and Assembly = 15.7 FT  
BP - Total Length of Bottom Packers and Assembly = 4.65 FT  
D - Distance Between Ground Surface and Top of the Test Zone = 36.0 FT  
TP - Packers Inflation Pressure (D psi + 50 psi) = 185 PSI  
H1 - Distance Between Water Pressure Gauge and Ground Surface = 46.7 FT  
H2 - Distance Between Ground Surface and Ground Water Table = 12.46 FT

**NOTE:** Only the bottom packer was inflated for this test. The interval tested here may be considered from bottom of casing at 36.0' to 50.5' b/g.
### GZA GEOENVIRONMENTAL OF NEW YORK

**Client:** Entergy  
**Project Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Ed Borner
**Geologist:** Sara Covelli

**Boring No./Test No.:** MW-63 T2  
**Sheet:** 1 of 1  
**File No.:** 41.0017869.01  
**Project Location:** Indian Point

**Ground Surface EL (FT):** 14.178  
**Datum:** NGVD 29

**Ground Water Depth:** 12.20 ft (below grade)  
**Static Water Level Depth:** 1.83 ft  
**Ground Surface EL (FT) to Casing:** 50.5 ft

<table>
<thead>
<tr>
<th>TIME INTERVAL FROM TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/ΔT)</th>
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---

**Legend:**

- **A:** Total Length of Test Section (FT)  
- **TP:** Total Length of Top Packer and Assembly  
- **BP:** Total Length of Bottom Packer and Assembly  
- **D:** Distance Between Ground Surface and Top of the Test Zone  
- **PPI:** Packer Inflation Pressure (D PSI + 50 PSI)  
- **H1:** Distance Between Ground Surface and Ground Water Table  
- **H2:** Distance Between Water Pressure Gauge and Ground Surface

**Packers and Piping Diagram:**

- **Inflatable Packers**  
- **Perforated Pipe**

---

GZA  
**Boring No./Test No.:** MW-63 T2
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**Contractor**
Aquifer Drilling & Testing, Inc.

**Foreman**
Ed Borner

**GZA Eng.**
Sara Covelli

**Boring No./Test No.**
MW-63 T3

**File No.**
41.0017869.01

**Project Location**
Indian Point

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**Boring Coordinates**
N 462780.4209 E 604251.2759

**Datum**
NGVD 29

**Final Boring Depth (FT)**
201

**Date Start/End**
11/14/06

**Ground Surface EL.(FT)**
14.178

**Ground Water Depth**
11.68 (below grade)

**Diameter of Drilled Borehole**
3.83 inch

**I.D. of Drilling Rods**
2 inch

<table>
<thead>
<tr>
<th>Tested Interval (HR:MIN)</th>
<th>Time Elapsed (HR:MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Cumulative Recovery (H5 FT)</th>
<th>Recovery Rate (H5/H5)</th>
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**Legend:**
- **A** - Total Length of Test Section (FT)
- **TP** - Total Length of Top Packers and Assembly
- **BP** - Total Length of Bottom Packers and Assembly
- **D** - Distance Between Ground Surface and Top of the Test Zone
- **PIP** - Packers Inflation Pressure (D Psi + 50 Psi)
- **H1** - Distance Between Water Pressure Gauge and Ground Surface
- **H2** - Distance Between Ground Surface and Ground Water Table

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**GZA**

BORING NO./TEST NO. MW-63 T3
## PACKER TEST LOG

### Client Information
- **Client:** Entergy
- **Location:** Indian Point Energy Center
- **Address:** Buchanan, NY

### Boring Information
- **Boring No./Test No.:** MW-63 T4
- **Sheet:** 1 of 1
- **File No.:** 41.0017869.01
- **Project Location:** Indian Point

### Contractor
- **Name:** Aquifer Drilling & Testing, Inc.
- **Foreman:** Ed Borner
- **GZA Eng.:** Sara Covelli

### Coordinates
- **Boring Coordinates N:** 462970.4209
- **E:** 604251.2759

### Depths
- **Final Boring Depth (FT):** 201
- **Ground Water Depth:** 12.30 ft (below grade)
- **Static Water Level Depth:** 1.83 ft

### Diameter
- **Drilled Borehole Diameter:** 3.83 INCH
- **I.D. of Drilling Rods:** 2 INCH

### Water Recovery

<table>
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<tr>
<th>TIME Elapsed (Hr:Min)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY RATE (G/H FT)</th>
<th>RECOVERY RATE (G/H DI)</th>
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### Water Flow
- **Flow Rate:** FROM / TO (FT)
- **Test Interval:** 71.0-80.7'

### Pressure
- **Packers:**
  - **Inflatable:**
  - **Perforated:**

### Legend
- **A**: Total length of test section (FT)
- **BP**: Total length of bottom packer and assembly
- **D**: Distance between ground surface and top of the test zone
- **G**: Packers
- **H1**: Distance between water pressure gauge and ground surface
- **H2**: Distance between ground surface and ground water table
- **TP**: Packers inflation pressure (D PSI + 50 PSI)

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**GZA GEOENVIROMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**ENTREPRENEURS AND ENGINEERS**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Buchanan, NY**
## PACKER TEST LOG

### Client
Entergy Indian Point Energy Center

### Project Location
Indian Point, NY

### Boring No./Test No.
MW-63 T5

### Contractor
Aquifer Drilling & Testing, Inc.

### Foreman
Ed Borner

### GZA Eng.
Sara Covelli

### Boring Coordinates
N 462970.4209 E 604251.2759

### Final Boring Depth (FT)
201

### Datum
NGVD 29

### Date Start/End
11/13/06

### Diameter of Drilled Borehole
3.83 INCH

### Ground Water Depth
12.73 (below grade)

### Static Water Level Depth
1.83 FT ground to casing

### I.D. of Drilling Rods
2 INCH

<table>
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<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (ΔT MIN)</th>
<th>Depth Under Water (FT)</th>
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<th>Cumulative Recovery (Q FT)</th>
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</table>

### Legend:
- **A**: Total Length of Test Section (FT)
- **BP**: Total Length of Bottom Packers and Assembly
- **TP**: Total Length of Top Packers and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Packers Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table
- **Q**: Nitrogen Supply Line
- **FLOW RATE**: Flow Rate From / To (FT)
- **INTERVAL**: Interval Tested Depth Under Water (FT)
- **TESTED DEPTH UNDER WATER (FT)**: Depth Under Water (FT)
- **DEPT TO WATER**: Depth To Water (FT)
- **DEPT UNDER WATER**: Depth Under Water (FT)
- **CUMULATIVE RECOVERY**: Cumulative Recovery (Q FT)
- **RECOVERY RATE**: Recovery Rate (Q/ΔT)
- **GZ A BORING NO./TEST NO. MW-63 T5**
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Ed Borner
GZA ENG.: Sara Covelli

BORING NO./TEST NO.: MW-63 T6
FILE NO.: 41.0017869.01
PROJECT LOCATION: Indian Point

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 12.79 FT (below grade)

GROUND WATER DEPTH (STATIC WATER LEVEL DEPTH): 1.83 FT ground to casing

I.D. OF DRILLING RODS: 2 INCH

<table>
<thead>
<tr>
<th>TESTED INTERVAL FROM TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
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<th>RECOVERY RATE (GPH)</th>
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LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
B - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
C - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
P - PACKER INFLATION PRESSURE (LBS/PSI)
H1 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
H2 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

INFLATABLE PACKERS

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

BORING NO./TEST NO.: MW-63 T6
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18TH FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy Indian Point Energy Center

**Project Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Boring No./Test No.:** MW-63 T7

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<td>Indian Point</td>
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<tr>
<th>Foreman</th>
<th>GZA Eng.</th>
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<tr>
<td>Ed Borner</td>
<td>Sara Covelli</td>
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**Boring No./Test No.:** MW-63 T7

**File No.:** 41.0017869.01

**Sheet:** 1 of 1

**Ground Water Depth:** 12.22 ft (below grade) 1.83 ft ground to casing

**Diaper of Drilled Borehole:** 3.83 inch

**I.D. of Drilling Rods:** 2 inch

### Log Data

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<th>Time</th>
<th>Elapsed Time</th>
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<th>Depth to Water (ft)</th>
<th>Cumulative Recovery (ft)</th>
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**Legend:**
- A: Total Length of Test Section (ft)
- TP: Total Length of Top Packer and Assembly
- BP: Total Length of Bottom Packer and Assembly
- D: Distance between Ground Surface and Top of the Test Zone
- PIP: Packer Inflation Pressure (D PSI + 50 PSI)
- H1: Distance between Water Pressure Gauge and Ground Surface
- H2: Distance between Ground Surface and Ground Water Table

---

**GZA**
## PACKER TEST LOG

**Client**
Entergy Indian Point Energy Center

**Boring No./Test No.**
MW-63 T8

**Contractor**
Aquifer Drilling & Testing, Inc.

**Foreman**
Ed Borner

**GZA Eng.**
Sara Covelli

**Location**
Indian Point

**Project Location**
Indian Point

**Sheet**
1 of 1

**File No.**
41.0017869.01

### Test Log

**Interval**

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<th>Cumulative Recovery (ft)</th>
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**Legend:**

- **A** - Total length of test section (ft)
- **L** - Depth of test (ft)
- **TP** - Total length of top packer and assembly
- **BP** - Total length of bottom packer and assembly
- **D** - Distance between ground surface and top of the test zone
- **P** - Diameter of drilled borehole
- **I.D.** - Diameter of drilling rods
- **Packer Inflation Pressure**
- **Flow Rate**
- **Cumulative Recovery**
- **Recovery Rate**
- **Nitrogen Supply Line**
- **Ground Surface Elevation**
- **Flow Direction**
- **Ground Water Table**
- **Perforated Pipe**
- **Inflatable Packers**

---

**Notes:**

- **N** - North
- **E** - East
- **NGVD 29**

**Date Start/End:**
11/10/06

**Ground Water Depth:**
11.24 ft (below grade)

**Flow Rate:**

- **L= 9.7 ft**
  - 14:41:00: 0.0 ft
  - 14:41:30: 0.5 ft
  - 14:42:00: 1.0 ft
  - 14:42:30: 1.5 ft
  - 14:43:00: 2.0 ft
  - 14:43:30: 2.5 ft
  - 14:44:00: 3.0 ft
  - 14:44:30: 3.5 ft
  - 14:45:00: 4.0 ft
  - 14:45:30: 4.5 ft
  - 14:46:00: 5.0 ft
  - 14:46:30: 5.5 ft
  - 14:47:00: 6.0 ft
  - 14:47:30: 6.5 ft
  - 14:48:00: 7.0 ft
  - 14:48:30: 7.5 ft
  - 14:49:00: 8.0 ft
  - 14:49:30: 8.5 ft
  - 14:50:00: 9.0 ft
  - 14:50:30: 9.5 ft
  - 14:51:00: 10.0 ft
  - 14:51:30: 10.5 ft
  - 14:52:00: 11.0 ft

**Recovery Rate:**

- **5.69600**
- **4.82333**
- **4.51700**
- **4.23480**
- **3.73600**
- **3.51000**
- **3.29911**
- **3.09880**
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- **1.81270**
- **1.73324**
- **1.65973**

**Diagram Notes:**

- **P** - Top Packer
- **Q** - Bottom Packer
- **G** - Ground Surface
- **H1** - Distance between Water Pressure Gauge and Ground Surface
- **H2** - Distance between Ground Surface and Ground Water Table
- **D** - Distance between Ground Surface and Top of the Test Zone
- **TP** - Total Length of Top Packer and Assembly
- **BP** - Total Length of Bottom Packer and Assembly
- **A** - Total Length of Test Section

---

**GZA**

**Boring No./Test No.**
MW-63 T8
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<th>TIME (HR:MIN)</th>
<th>Elapsed Time (Δt Min)</th>
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<th>Depth To Water (FT)</th>
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LEGEND:  
A - TOTAL LENGTH OF TEST SECTION (FT)  
B - TOTAL LENGTH OF BORING  
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE  
P - PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
Q - NITROGEN SUPPLY LINE  
R - FLOW RATE  
S - GROUND SURFACE ELEVATION  
T - WATER FLOW DIRECTION  
U - INFLATABLE PACKERS  
V - PERFORATED PIPE  
W - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
X - 9.7 FT  
Y - 15.7 FT  
Z - 4.65 FT  
AA - 123.5 FT  
AB - 180 PSI  
AC - 129.9 FT  
AD - 12.15 FT  
AE - 123.5 FT  
AF - 180 PSI  
AG - 129.9 FT  
AH - 12.15 FT  
AI - 123.5 FT  
AJ - 180 PSI  
AK - 129.9 FT  
AL - 12.15 FT  
AM - 123.5 FT  
AN - 180 PSI  
AO - 129.9 FT  
AP - 12.15 FT  
AQ - 123.5 FT  
AR - 180 PSI  
AS - 129.9 FT  
AT - 12.15 FT
## PACKER TEST LOG

### Client Information
- **Entergy Indian Point Energy Center**
- **Buchanan, NY**

### Contractor Information
- **Aquifer Drilling & Testing, Inc.**
- **Foreman:** Ed Borner
- **GZA Eng.:** Sara Covelli

### Project Details
- **Location:** Indian Point
- **Boring Number:** MW-63 T10
- **Sheet:** 1 of 1
- **File No.:** 41.0017869.01
- **Date:** 11/10/06

### Boring Coordinates
- **North:** 462970.4209
- **East:** 604251.2759
- **Datum:** NGVD 29

### Boring Details
- **Final Boring Depth:** 201 ft
- **Ground Surface El. (ft):** 14.178
- **Ground Water Depth:** 13.60 ft (below grade)
- **Casing Depth:** 1.83 ft ground to casing
- **Drilled Borehole Diameter:** 3.83 inch
- **Drilling Rods Diameter:** 2 inch

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### Legends
- **A:** Total Length of Test Section (ft)
- **L:** Total Length of Test Section (ft)
- **B:** Total Length of Bottom Packers and Assemblies
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **P:** Packers
- **TP:** Total Length of Top Packers and Assemblies
- **BP:** Total Length of Bottom Packers and Assemblies
- **GWT:** Ground Water Table
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
- **E:** Nitrogen Supply Line
- **G:** Flow Rate
- **P:** Packers
- **Q:** Inflatable Packers
- **BP:** Total Length of Bottom Packers and Assemblies
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**: Entergy  
**Location**: Indian Point Energy Center, Buchanan, NY  
**File No.**: 41.0017869.01

### BORING COORDINATES
- **N**: 462970.4209  
- **E**: 604251.2759  
- **Datum**: NGVD 29

### Final Boring Depth
- **Depth** (ft): 201  
- **Date Start/End**: 11/10/06

### Boring No./Test No.
- **MW-63**  
- **T11**

### Diameter of Drilled Borehole
- **Inch**: 3.83  
- **Ground Water Depth**: 13.2 (below grade)  
- **Ground to Casing**: 1.83 ft (static water level depth)

### I.D. of Drilling Rods
- **Inch**: 2

### legend:
- **A**: Total length of Test Section (ft)
- **B**: Total Length of Top Packers and Assembly
- **BP**: Total Length of Bottom Packers and Assembly
- **D**: Distance between Ground Surface and Top of the Test Zone
- **PQP**: Perforated pipes
- **G**: Ground surface elevation
- **H1**: Distance between water pressure gauge and ground surface
- **H2**: Distance between ground surface and ground water table
- **P**: Inflatable packers

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### Table: Test Log

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**Note:**  
- **Flow Rate**: From / To (ft)
- **Interval**: Tested Depth Under Water (ft)
- **L= 9.7 ft**
- **δH/δt**: Nitrogen Supply Line
- **GWT**: Water Flow Direction
- **D**: Distance between ground surface and top of the test zone
- **H1**: Distance between water pressure gauge and ground surface
- **H2**: Distance between ground surface and ground water table

---

**GZA** BORING NO./TEST NO. MW-63 T11
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Boring No./Test No.**  
MW-63 T12

**Site Location**  
Indian Point

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**Legend:**  
A - Total Length of Test Section (FT)  
TP - Total Length of Top Packers and Assembly  
BP - Total Length of Bottom Packers and Assembly  
D - Distance Between Ground Surface and Top of the Test Zone  
PIP - Packer Inflation Pressure (D PSI + 50 PSI)  
H1 - Distance Between Water Pressure Gauge and Ground Surface  
H2 - Distance Between Ground Surface and Ground Water Table

---

**Packers:**  
- Nitrogen Supply Line
- Flow Rate
- Ground Surface Elevation
- Water Flow Direction
- Inflatable Packers
- Perforated Pipe
- BP - Total Length of Bottom Packers and Assembly

---

**Location:**  
Indian Point Energy Center

---

**Data:**  
- Diameter of Drilled Borehole: 3.83 inches
- Ground Water Depth: 13.12 feet (below grade)
- Total Length of Top Packers and Assembly: 15.7 feet
- Total Length of Bottom Packers and Assembly: 4.65 feet
- Distance Between Ground Surface and Top of the Test Zone: 165.0 feet
- Packer Inflation Pressure: 180 PSI
- Ground Water Depth: 1.83 feet

---

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client**

Entergy Indian Point Energy Centre
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Ed Borner

**GZA ENG.**

Sara Covelli

**PROJECT LOCATION**

Indian Point

**BORING NO./TEST NO.**

MW-63 T13

**FILE NO.**

41.0017869.01

**DATE START/END**

11/9/06

**DIAmeter OF DRILLED BOREHOLE**

3.83 INCH

**GROUND WATER DEPTH**

10.28 (below grade) 1.83 FT ground to casing

**I.D. OF DRILLING RODS**

2 INCH

---

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<th>DEPTH TO WATER (FT)</th>
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**LEGEND:**

- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PPIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**NOTE:** Only the top packer was inflated for this test. The interval tested here may be considered from 175.0' b/g to bottom of well.
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

---

**Client:** Entergy  
**Indian Point Energy Center**  
**Buchanan, NY**

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.  
**FOREMAN:** Dave Carter  
**GZA ENG.:** Sara Covelli

**PROJECT LOCATION:** Indian Point

**BORING NO./TEST NO.:** MW-66 T1  
**FILE NO.:** 41.0017869.01  
**DATE START/END:** 1/4/07

---

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 11.86 (below grade)  
**1.87 FT ground to casing**

---

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**LEGEND:**  
A - TOTAL LENGTH OF TEST SECTION (FT)  
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY  
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY  
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE  
P - PACKER INFLATION PRESSURE (D PSI + 50 PSI)  
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE  
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**NOTE:** Only the top packer was inflated for this test. The interval tested here may be considered from 182.0’ b/g to bottom of well.

---

**GZA**  
**BORING NO./TEST NO.:** MW-66 T1
## PACKER TEST LOG

**Client**: Entergy  
**Location**: Indian Point Energy Center, Buchanan, NY  
**Contractor**: Aquifer Drilling & Testing, Inc.  
**Foreman**: Dave Carter  
**GZA Eng.**: Sara Covelli  
**File No.**: 41.0017869.01  
**Project Location**: Indian Point

### Test Details
- **Boring No./Test No.**: MW-66 T2  
- **Date**: 1/4/07  
- **Diameter of Drilled Borehole**: 3.83 inch  
- **I.D. of Drilling Rods**: 2 inch

### Test Log

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<th>Elapsed Time (ΔT MIN)</th>
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<th>Depth to Water (FT)</th>
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**Legend:**  
- **A**: Total Length of Test Zone (FT)  
- **BP**: Total Length of Bottom Packers and Assembly  
- **D**: Distance Between Ground Surface and Top of the Test Zone  
- **GWT**: Ground Water Table  
- **H1**: Distance Between Water Pressure Gauge and Ground Surface  
- **H2**: Distance Between Ground Surface and Ground Water Table  
- **INFLATABLE PACKERS**  
- **PACKER INFLATION PRESSURE**: (D PSI + 50 PSI)  
- **PIP**: Perforated Pip  
- **QP**: Total Length of Top Packers and Assembly  
- **Q**: Nitrogen Supply Line  
- **TIME WATER RECOVERY RATE**
  - **(HR:MIN)**
  - **(50/min)**  
  - **(FT)**

**Notes:**  
- **Water Flow Direction**  
- **Ground Surface Elevation**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**  
**440 Ninth Avenue, 18th Floor**  
**New York, New York 10001**  
**Scientists and Engineers**  
**Entergy Indian Point Energy Center**
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Centre

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter

GROUND SURFACE EL (FT) 14.021
DATE START/END 1/4/07

DIAMETER OF DRILLED BOREHOLE 3.83 INCH

I.D. OF DRILLING RODS 2 INCH

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

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<th>DEPTH TO WATER (FT)</th>
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## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**Client:** Entergy Indian Point Energy Centre

**Project Location:** Indian Point, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Dave Carter

**GZA ENG:** Sara Covelli

**Boring Coordinates:** N 46°3147.3648 E 604409.1969

**Datum:** NGVD 29

**Final Boring Depth (FT):** 200

**Date Start/End:** 1/5/07

**Diameter of Drilled Borehole:** 3.83 inch

**I.D. of Drilling Rods:** 2 inch

### Test Results

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<th>Cumulative Recovery (HD FT)</th>
<th>Recovery Rate (HD/Min)</th>
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**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

---

**Figure:**
- **Ground Surface Elevation**
- **Water Flow Direction**
- **Inflatable Packers**
- **Perforated Pipe**
- **NITROGEN SUPPLY LINE**
- **FLOW RATE**

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 Ninth Avenue, 18th Floor**

**New York, New York 10001**

**Buchanan, NY**

**Boring No./Test No.:** MW-66 T4

**File No.:** 41.0017869.01

---

**GZA**

**Scientists and Engineers**

**Indian Point Energy Centre**

**Buchanan, NY**

---

**BORING NO./TEST NO.: MW-66 T4**
### Packager Test Log

**GZA GEOSTRATGICAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
**SCIENTISTS AND ENGINEERS**  

**Client:** Entergy  
**Location:** Indian Point Energy Center, Buchanan, NY

**Boring No./Test No.:** MW-66 T5  
**File No.:** 41.0017869.01

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter  
**GZA Eng:** Sara Covelli

**Boring Coordinates:**  
**N:** 463147.3648  
**E:** 604409.1969  
**Datum:** NVD 29  
**Depth:** 14 ft  
**Date:** 1/5/07

**Drilled Borehole:**  
**Diameter:** 3.83 inches  
**ID of Drilling Rods:** 2 inches

**Ground Water Depth:** 12.40 feet (below grade)  
**Ground Surface El.:** 14.021 feet

**Ground Water Level Depth:** 1.87 feet

**Flow Rate:**  
**Flow Direction:**

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<tr>
<th>Depth Under Water (ft)</th>
<th>Cumulative Recovery (ft)</th>
<th>Recovery Rate (ft/h)</th>
<th>Time Elapsed</th>
<th>NITROGEN SUPPLY LINE</th>
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**Legend:**  
A - Total Length of Test Section (ft)  
TP - Total Length of Top Packers and Assembly  
BP - Total Length of Bottom Packers and Assembly  
D - Distance Between Ground Surface and Top of the Test Zone  
H1 - Distance Between Water Pressure Gauge and Ground Surface  
H2 - Distance Between Ground Surface and Ground Water Table

**Lengths:**  
- 9.7 ft  
- 15.7 ft  
- 4.65 ft  
- 142.3 ft  
- 180 psi  
- 147.4 ft  
- 12.40 ft
# PACKER TEST LOG

## Client Information
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

## Project Information
**Project Location:** Indian Point
**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Dave Carter
**GZA Eng.:** Sara Covelli

## Boring Details
- **Boring No./Test No.:** MW-66 T6
- **File No.:** 410017869.01
- **Sheet:** 1 of 1
- **Client:** Entergy Indian Point Energy Center
- **Location:** Buchanan, NY

## Boring Coordinates
- **Ground Surface El. (FT):** 14.021 DATUM NGVD 29
- **Final Boring Depth (FT):** 200
- **Date Start/End:** 1/5/07

## Drilled Borehole Details
- **Diameter of Drilled Borehole:** 3.83 inch
- **I.D. of Drilling Rods:** 2 inch
- **Ground Water Depth (below grade):** 12.10 FT ground to casing

## Ground Water Depth
- **Static Water Level Depth:**

## Water Flow Direction
- **Flow Rate:**

## Flow Rate Table
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<th>Time (HR:MIN:SEC)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Drawdown (Δ FT)</th>
<th>Pumping Rate (gpm/min)</th>
<th>Specific Capacity (gpm/ft)</th>
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## Definitions
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance between Ground Surface and Top of the Test Zone
- **PBP:** Packers Inflation Pressure (psi + 50 psi)
- **H1:** Distance between Water Pressure Gauge and Ground Surface
- **H2:** Distance between Ground Surface and Ground Water Table

---

## Diagram
- Diagram of ground water level, inflatable packers, and perforated pipe. The diagram illustrates the depth measurement points and water flow direction.

---

**Legend:**
- A: Total Length of Test Section (FT)
- TP: Total Length of Top Packers and Assembly
- BP: Total Length of Bottom Packers and Assembly
- D: Distance between Ground Surface and Top of the Test Zone
- PBP: Packers Inflation Pressure ( PSI + 50 PSI)
- H1: Distance between Water Pressure Gauge and Ground Surface
- H2: Distance between Ground Surface and Ground Water Table
### Packers Test Log

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 Ninth Avenue, 18th Floor
New York, New York 10001

**Client:** Entergy

**Project Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Dave Carter

**GZA Eng.:** Sara Covelli

**Boring No./Test No.:** MW-66 T7

**Boring Coordinates:**

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<th>E</th>
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<td>6°04'40.1969&quot;</td>
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**Final Boring Depth (FT):** 200

**Date Start/End:** 1/5/07

**Ground Water Depth:** 11.35 ft (below grade) 1.87 ft ground to casing

**Diameter of Drilled Borehole:** 3.83 inch

**I.D. of Drilling Rods:** 2 inch

<table>
<thead>
<tr>
<th>Time</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (FT)</th>
<th>Recovery Rate (Hg/ft)</th>
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</tr>
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</table>

**Legend:**

- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance between Ground Surface and Top of the Test Zone
- **PL:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance between Water Pressure Gauge and Ground Surface
- **H2:** Distance between Ground Surface and Ground Water Table

---

**Diagram:**

- **P:** Boring Point
- **Q:** Casing Point
- **GWT:** Ground Water Table
- **H1:** Distance between Water Pressure Gauge and Ground Surface
- **H2:** Distance between Ground Surface and Ground Water Table
- **BP:** Total Length of Bottom Packers and Assembly
- **TP:** Total Length of Top Packers and Assembly
- **D:** Distance between Ground Surface and Top of the Test Zone
- **PL:** Packers Inflation Pressure (D PSI + 50 PSI)
- **L:** Length
- **T:** Time
- **Q:** Flow Rate
- **P:** Ground Surface Elevation
- **S:** Static Water Level Depth
- **D:** Distance
- **A:** Inflatable Packers
- **Q:** Perforated Pipe

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

Sciences and Engineers

GZA

Entergy

Indian Point Energy Center

Buchanan, NY

**File No.:** 41.0017869.01

**Project Location:** Indian Point

**Number of Sheets:** 1 of 1
### PACKER TEST LOG

**Client:** Entergy Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Dave Carter

**Ground Surface EL (FT):** 14.021

**Final Boring Depth (FT):** 200

**Date Start/End:** 1/5/07

**Boring Coordinates:**
- N: 463147.3648
- E: 604409.1969

**Datum:** NGVD 29

**Ground Water Depth:** 11.62 ft (below grade) 1.87 ft (static water level depth)

**Diameter of Drilled Borehole:** 3.83 inch

**I.D. of Drilling Rods:** 2 inch

---

**LEGEND:**
- **A** - Total Length of Test Section (FT)
- **BP** - Total Length of Bottom Packers and Assembly
- **D** - Distance Between Ground Surface and Top of the Test Zone
- **IP** - Packers Inflation Pressure (D PSI + 50 PSI)
- **H1** - Distance Between Water Pressure Gauge and Ground Surface
- **H2** - Distance Between Ground Surface and Ground Water Table

---

#### Test Results

<table>
<thead>
<tr>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (ΔT MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy Indian Point Energy Centre

**BORING NO./TEST NO.:** MW-66 T9

**PROJECT LOCATION:** Indian Point

### GZA ENG.

- **Dave Carter**

- **Sara Covelli**

**DATE START/END:** 1/8/07

**GROUND WATER DEPTH:** 12.70 (below grade) 1.87 FT ground to casing

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**I.D. OF DRILLING RODS:** 2 INCH

### TESTED INTERVAL

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<tr>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/ΔT)</th>
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### LEGEND:

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**NITROGEN SUPPLY LINE**: 1.87 FT ground to casing

**GROUND SURFACE ELEVATION**: 84.0 FT

**WATER FLOW DIRECTION**:

**INFLATABLE PACKERS**:

**PERFORATED PIPE**:
### PACKER TEST LOG

**Client**: Entergy Indian Point Energy Center  
**Boring No./Test No.**: MW-66, T10  
**File No.**: 41.0017869.01  
**Project Location**: Indian Point, NY

**Contractor**: Aquifer Drilling & Testing, Inc.  
**Foreman**: Sara Covelli  
**GZA Eng.**: Dave Carter  
**Boring Coordinates**

- **N**: 463147.3648
- **E**: 604409.1969
- **Datum**: NGVD 29
- **Final Boring Depth (FT)**: 200
- **Date Start/End**: 1/9/07

**Boring No./Test No.**

- MW-66, T10

**Client Information**

- **Client**: Entergy Indian Point Energy Center
- **Address**: 440 Ninth Avenue, 18th Floor, New York, NY 10001

**Project Location**: Indian Point

**Diameter of Drilled Borehole**: 3.83 inch

**I.D. of Drilling Rods**: 2 inch

**Ground Water Depth**

- **Below Grade**: 12.60 ft
- **(Static Water Level Depth)**: 1.87 ft

**Water Flow Direction**

- **Flow Rate**: 1.87 ft ground to casing

**Legend**

- **A**: Total Length of Test Section (FT)
- **BP**: Total Length of Bottom Packers and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **GWT**: Ground Water Table
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Water Pressure Gauge and Ground Water Table
- **L**: Total Length of Test Section (FT)
- **P**: Nitrogen Supply Line
- **Q**: Flow Rate

### Test Data

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<th>Depth Under Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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**Client Information**

- **Client**: Entergy Indian Point Energy Center
- **Address**: 440 Ninth Avenue, 18th Floor, New York, NY 10001
**GZA GEOENVIRONMENTAL OF NEW YORK**

Client: Indian Point Energy Center

Boring/Project Location: Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.

**Foreman:** Dave Carter

**Ground Surface El. (FT):** 14.021

**Date Start/End:** 1/9/07

**Final Boring Depth (FT):** 200

**Ground Water Depth:** (below grade) 12.15 (below grade) 1.87 ft ground to casing

**I.D. of Drilling Rods:** 2 inch

**DIAMETER OF DRILLED BOREHOLE:** 3.83 inch

**GZA Eng.:** Sara Covelli

**File No.:** 41.0017869.01

**440 NINTH AVENUE, 18TH FLOOR**

**FILE NO.:** 41.0017869.01

**PROJECT LOCATION:** Indian Point

**49X672**

**49X650**

**DIAMETER OF DRILLED BOREHOLE:** 3.83 inch

**GROUND WATER DEPTH:** (static water level depth)

**I.D. OF DRILLING RODS:** 2 inch

**LEGEND:**

- **A:** Total Length of Test Section (ft)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packered Inflation Pressure (D psi + 50 psi)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

**TESTED INTERVAL FROM / TO (FT):**

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<tr>
<th>Time</th>
<th>Elapsed Time</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (DH FT)</th>
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## PACKER TEST LOG

**Client:** Entergy  
**Project Location:** Indian Point

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter  
**GZA ENG.:** Sara Covelli

**Client:**-boring No. / Test No.: MW-66 T12  
**Site Location:** Indian Point

### Boring Coordinates
- North: 463147.3648  
- East: 604409.1969

### Ground Surface EL. (ft)
- 14.021  
- Datum: NGVD 29

### Final Boring Depth (ft)
- 200  
- Date Start/End: 1/8/07

### Diameter of Drilled Borehole
- 3.63 inch

### Ground Water Depth
- 11.25 (below grade)
- 1.87 ft ground to casing

### I.D. of Drilling Rods
- 2 inch

### Packers
- Total Length of Top Packer and Assembly (ft): 15.7
- Total Length of Bottom Packer and Assembly (ft): 4.65
- Distance between Ground Surface and Top of the Test Zone (ft): 38.0
- Distance between Water Pressure Gauge and Ground Surface (ft): 47.8
- Distance between Ground Surface and Ground Water Table (ft): 11.25

### Nitrogen Supply Line
- Pressure: 175 PSI
- Length: 24.0 ft

### Notes:
The tested interval begins at the bottom of the well casing (38.0’ b/g) and ends at 52.0’ b/g. Only the bottom packer was inflated for this interval.

### Table: Flow Rate

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**Legend:**
- A: Total Length of Test Section (ft)
- TP: Total Length of Top Packer and Assembly (ft)
- BP: Total Length of Bottom Packer and Assembly (ft)
- D: Distance between Ground Surface and Top of the Test Zone (ft)
- PIP: Packer Inflation Pressure (175±50 PSI)
- H1: Distance between Water Pressure Gauge and Ground Surface (ft)
- H2: Distance between Ground Surface and Ground Water Table (ft)

**Notes:**
- Calculations are based on the tested interval where the well casing is 38.0’ b/g and ends at 52.0’ b/g.
GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter
GZA ENG.: Sara Covelli

PROJECT LOCATION: Indian Point
CONTRACTOR COORDINATES: N 463127.0611 E 604426.6654
DATE START/END: 8/7/07

DIAIMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 13.17 (below grade)

NOTE: Only the top packer was inflated for this test. The interval tested here may be considered from 331.1' b/g to bottom of well.
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS  

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Dave Carter

**GZA Eng.**  
Sara Covelli

**Client BORING NO./TEST NO.**  
MW-67 T1CH

**Site**  
Indian Point

**Boring Coordinates**  
GROUND SURFACE EL.(FT)  14.356  
DATE START/END  8/7/07

**Final Boring Depth (FT)**  
15.17 (below grade)

**Casing is 0.15 ft above ground.**

**Ground Water Depth**  
13.17 (below grade)

**Ground Surface EL. (FT)**  
14.356  
DATUM NGVD 29

**Diameter of Drilled Borehole**  
3.83 INCH

**I.D. of drilling rods**  
2 INCH

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**Legend:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **H2** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

**Flow Diagram:**
- **GWT** - Ground Water Table
- **H1** - Distance between water pressure gauge and ground surface
- **H2** - Distance between ground surface and ground water table
- **GZA** - GZA BORING NO./TEST NO. MW-67 T1CH
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**CONTRACTOR**: Aquifer Drilling & Testing, Inc.
**FOREMAN**: Dave Carter

**GZA ENG.**: Sara Covelli

**PROJECT LOCATION**: Indian Point

**DATE START/END**: 8/7/07

**GRID SURFACE EL.(FT)**: 14.356

**GROUND WATER DEPTH**: 13.75 (below grade)

**DIAMETER OF DRILLED BOREHOLE**: 3.83 INCH

**Casing is 0.15 ft above ground.**

**DIA. OF DRILLING RODS**: 2 INCH

---

**TESTED INTERVAL FROM/TO (FT)**

<table>
<thead>
<tr>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY RATE (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/ΔT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>324.1 - 338.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:09:30</td>
<td>0.0</td>
<td>268.198</td>
<td>22.50</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>14:10:00</td>
<td>0.5</td>
<td>272.328</td>
<td>18.37</td>
<td>4.13</td>
<td>8.26000</td>
</tr>
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<td>16.61</td>
<td>5.89</td>
<td>5.89000</td>
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<tr>
<td>14:11:00</td>
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<td>15.71</td>
<td>6.79</td>
<td>4.52533</td>
</tr>
<tr>
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<td>2.0</td>
<td>275.632</td>
<td>15.07</td>
<td>7.43</td>
<td>3.71700</td>
</tr>
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<td>2.71767</td>
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<td>1.08888</td>
</tr>
</tbody>
</table>

**NOTES**: Excessive interconnectivity observed between test zone and below the test zone. Test was stopped after drawdown and recovery.

---

**LEGEND**:
- **A**: TOTAL LENGTH OF TEST SECTION (FT)
- **TP**: TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP**: TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D**: DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP**: PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1**: DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2**: DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**FLOW RATE**

**PACKER INFLATION PRESSURE**

**NITROGEN SUPPLY LINE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**SCIENTISTS AND ENGINEERS**

<table>
<thead>
<tr>
<th>Client</th>
<th>Entergy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Indian Point Energy Center</td>
</tr>
<tr>
<td></td>
<td>Buchanan, NY</td>
</tr>
</tbody>
</table>

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

**CRAINING**

Casing is 0.15 ft above ground.

---

**TESTED INTERVAL FROM TO (FT)**

<table>
<thead>
<tr>
<th>TIME</th>
<th>ELAPSED TIME (HR.MIN.SEC)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (FT)</th>
<th>PUMPING RATE (gpm)</th>
<th>SPECIFIC CAPACITY (gpm/FT)</th>
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<tbody>
<tr>
<td>319.6 - 334.4</td>
<td>13:38</td>
<td>0</td>
<td>259.149</td>
<td>27.04</td>
<td>13.581</td>
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</tr>
<tr>
<td>L= 14.8 Ft</td>
<td>13:39</td>
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<td>259.114</td>
<td>27.08</td>
<td>13.616</td>
<td>1.300</td>
</tr>
<tr>
<td>13:40</td>
<td>2</td>
<td>259.149</td>
<td>27.04</td>
<td>13.581</td>
<td>1.300</td>
<td>0.096</td>
</tr>
<tr>
<td>13:41</td>
<td>3</td>
<td>259.149</td>
<td>27.04</td>
<td>13.581</td>
<td>1.300</td>
<td>0.096</td>
</tr>
<tr>
<td>13:42</td>
<td>4</td>
<td>259.149</td>
<td>27.08</td>
<td>13.616</td>
<td>1.300</td>
<td>0.095</td>
</tr>
<tr>
<td>13:43</td>
<td>5</td>
<td>259.149</td>
<td>27.08</td>
<td>13.616</td>
<td>1.300</td>
<td>0.095</td>
</tr>
<tr>
<td>13:44</td>
<td>6</td>
<td>259.078</td>
<td>27.11</td>
<td>13.652</td>
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<td>0.095</td>
</tr>
<tr>
<td>13:45</td>
<td>7</td>
<td>259.006</td>
<td>27.18</td>
<td>13.724</td>
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<td>259.042</td>
<td>27.15</td>
<td>13.688</td>
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<td>259.006</td>
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<td>13.724</td>
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<td>27.27</td>
<td>13.76</td>
<td>1.300</td>
<td>0.094</td>
</tr>
<tr>
<td>14:00</td>
<td>22</td>
<td>258.826</td>
<td>27.36</td>
<td>13.904</td>
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<td>0.093</td>
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<tr>
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<td>258.862</td>
<td>27.33</td>
<td>13.868</td>
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<td>0.094</td>
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<tr>
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<td>32</td>
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<td>27.36</td>
<td>13.904</td>
<td>1.300</td>
<td>0.093</td>
</tr>
<tr>
<td>14:15</td>
<td>37</td>
<td>258.790</td>
<td>27.40</td>
<td>13.94</td>
<td>1.300</td>
<td>0.093</td>
</tr>
<tr>
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<td>42</td>
<td>258.790</td>
<td>27.40</td>
<td>13.94</td>
<td>1.300</td>
<td>0.093</td>
</tr>
</tbody>
</table>

**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**SCIENTISTS AND ENGINEERS**

GZA BORING NO./TEST NO. MW-67 T2A CH

<table>
<thead>
<tr>
<th>N.</th>
<th>E.</th>
<th>Datum</th>
<th>Start/End</th>
</tr>
</thead>
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<tr>
<td>463127.0611</td>
<td>604426.6654</td>
<td>NOV/29</td>
<td>8/8/07</td>
</tr>
</tbody>
</table>

---

**PROJECT LOCATION**

Indian Point

---

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Sara Covelli

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

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**CRAINING**

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**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

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**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

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**CRAINING**

Casing is 0.15 ft above ground.

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**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

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**CRAINING**

Casing is 0.15 ft above ground.

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**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

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**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.

---

**GROUND SURFACE EL. (FT)**

14.356

**DATE START/END**

8/8/07

---

**CRAINING**

Casing is 0.15 ft above ground.
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**Location**
Indian Point

**Contractor**
Aquifer Drilling & Testing, Inc.

**Boring Information**
- Boring No./Test No.: MW-67 T2B
- Site Address: 440 NINTH AVENUE, 18th FLOOR
- File No.: 41.0017869.01

**Coordinates**
- Boring Coordinates: N 463127.0611, E 604426.6654
- Datum: NGVD 29
- Date Start/End: 8/8/07

**Drilling Details**
- Diameter of Drilled Borehole: 3.83 inch
- Ground Surface EL (FT): 14.356
- Ground Water Depth: 13.26 feet (below grade)
- Casing is 0.15 ft above ground.

**Drilling Logs**

<table>
<thead>
<tr>
<th>TIME Elapsed (HR:MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY RATE (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/Δt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:35:30 0.0</td>
<td>266.905</td>
<td>19.32</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
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<td>0.00</td>
</tr>
<tr>
<td>9:36:30 1.0</td>
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</tr>
<tr>
<td>9:36:30 1.5</td>
<td>271.538</td>
<td>14.68</td>
<td>4.63</td>
<td>0.50</td>
</tr>
<tr>
<td>9:36:30 2.0</td>
<td>272.292</td>
<td>13.93</td>
<td>5.39</td>
<td>1.00</td>
</tr>
<tr>
<td>9:36:30 3.0</td>
<td>273.082</td>
<td>13.14</td>
<td>6.18</td>
<td>1.50</td>
</tr>
<tr>
<td>9:36:30 4.0</td>
<td>273.334</td>
<td>12.89</td>
<td>6.43</td>
<td>2.00</td>
</tr>
<tr>
<td>9:36:30 5.0</td>
<td>273.513</td>
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<td>6.61</td>
<td>2.50</td>
</tr>
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<td>9:36:30 6.0</td>
<td>273.621</td>
<td>12.40</td>
<td>6.72</td>
<td>3.00</td>
</tr>
</tbody>
</table>

**Diagram**

- Nitrogen Supply Line
- Flow Rate
- Inflatable Packers
- Perforated Pipe
- Ground Surface Elevation
- Water Flow Direction

**Legend:**
- **A** - Total Length of Test Section (FT) = 30.15 FT
- **TP** - Total Length of Top Packers and Assembly = 19.9 FT
- **BP** - Total Length of Bottom Packers and Assembly = 3.85 FT
- **D** - Distance Between Ground Surface and Top of the Test Zone = 319.6 FT
- **P** - Packers Inflation Pressure (D PSI + 50 PSI) = 220 PSI
- **H1** - Distance Between Water Pressure Gauge and Ground Surface = 286.2 FT
- **H2** - Distance Between Ground Surface and Ground Water Table = 13.26 FT

**Note:** Only the top packer was inflated for this test. The interval tested here may be considered from 319.6' b/g to bottom of well.
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

**Contractor**  
Aquifer Drilling & Testing, Inc.

**Foreman**  
Dave Carter

**GZA Eng.**  
Sara Covelli

**Client Boring No./Test No.**  
MW-67 T2B CH

**Boring Coordinates**  
N 463127.0611  E 604426.6654

**Ground Surface El. (ft)**  
14.356  
**Datum NGVD 29**

**Final Boring Depth (ft)**  
347.9  
**Date Start/End**  
8/9/07

**Diameter of Drilled Borehole**  
3.83 INCH

**I.D. of Drilling Rods**  
2 INCH

**Ground Water Depth**  
13.26 (below grade)  
Casing is 0.15 ft above ground.

**Static Water Level Depth**

**Packers Inflation Pressure**

**Time Elapsed**  
**Depth to Water [ft]**  
**Drawdown [ft]**  
**Pumping Capacity [gal/min]**  
**Specific Capacity [gpm/ft]**

<table>
<thead>
<tr>
<th>Interval</th>
<th>Time Elapsed</th>
<th>Depth to Water</th>
<th>Drawdown</th>
<th>Pumping Capacity</th>
<th>Specific Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>319.6 - 349.75</td>
<td>0</td>
<td>266.115</td>
<td>20.11</td>
<td>6.845</td>
<td>1.300</td>
</tr>
<tr>
<td>L = 30.15 ft</td>
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<td>266.115</td>
<td>20.11</td>
<td>6.845</td>
<td>1.300</td>
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<td>20.11</td>
<td>6.845</td>
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<td>6.845</td>
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<td>6.414</td>
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<td>10:14</td>
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<td>19.76</td>
<td>6.521</td>
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<td>32</td>
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<td>6.629</td>
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<tr>
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<td>47</td>
<td>266.259</td>
<td>19.96</td>
<td>6.701</td>
<td>1.300</td>
</tr>
</tbody>
</table>

**Legend:**  
A - Total length of test section (ft)  
L = 30.15 ft

**TP** - Total length of top packer and assembly  
= 19.9 ft

**BP** - Total length of bottom packer and assembly  
= 3.85 ft

**D** - Distance between ground surface and top of the test zone  
= 319.6 ft

**P** - Packers inflation pressure (psi + 50 psi)  
= 220 psi

**H1** - Distance between water pressure gauge and ground surface  
= 286.2 ft

**H2** - Distance between ground surface and ground water table  
= 13.26 ft

**Note:** Only the top packer was inflated for this test. The interval tested here may be considered from 319.6' b/g to bottom of well.

---

**Packers Inflation Pressure:**

**Flow Rate:**

**Ground Surface Elevation:**

**Water Flow Direction:**

**Inflatables:**

**Perforated Pipe:**

**BP, TP, and A:**

---

**Legend:**

- A - Total length of test section (ft)
- TP - Total length of top packer and assembly
- BP - Total length of bottom packer and assembly
- D - Distance between ground surface and top of the test zone
- P - Packers inflation pressure (psi + 50 psi)
- H1 - Distance between water pressure gauge and ground surface
- H2 - Distance between ground surface and ground water table

**Note:** Only the top packer was inflated for this test. The interval tested here may be considered from 319.6' b/g to bottom of well.

---

**GZA**  
BORING NO./TEST NO. MW-67 T2B CH
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy
**Address:** Indian Point Energy Center
**City:** Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Dave Carter
**GZA Eng.:** Sara Covelli

**Boring Coordinates:** N 463127.0611 E 604426.6654
**Date:** 8/9/07
**Datum:** NGVD 29

**Final Boring Depth (FT):** 14.356

**Ground Surface Elev. (FT):** 14.356

**Ground Water Depth:** 13.12

**Diameter of Drilled Borehole:** 3.83 Inch

**I.D. of Drilling Rods:** 2 Inch

**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packer and Assembly
- **BP:** Total Length of Bottom Packer and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packer Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table

<table>
<thead>
<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (Δt MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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**Flow Rate**

**Flow Rate From / To** (FT)

**Interval**

**Total Recovery**

**GWT**

**Packer Inflation Pressure**

**Ground Surface Elevation**

**Water Flow Direction**

**Diagram:**
- **P:** Packer
- **Q:** Inflatable Packers
- **A:** Total Length of Test Section
- **TP:** Total Length of Top Packer
- **BP:** Total Length of Bottom Packer
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **P:** Packer Inflation Pressure
- **H1:** Distance Between Ground Surface and Test Zone
- **H2:** Distance Between Ground Surface and Ground Water Table

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client:** Entergy
**Address:** Indian Point Energy Center
**City:** Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Dave Carter
**GZA Eng.:** Sara Covelli

**Boring Coordinates:** N 463127.0611 E 604426.6654
**Date:** 8/9/07
**Datum:** NGVD 29

**Final Boring Depth (FT):** 14.356

**Ground Surface Elev. (FT):** 14.356

**Ground Water Depth:** 13.12

**Diameter of Drilled Borehole:** 3.83 Inch

**I.D. of Drilling Rods:** 2 Inch

**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packer and Assembly
- **BP:** Total Length of Bottom Packer and Assembly
- **D:** Distance Between Ground Surface and Top of the Test Zone
- **PIP:** Packer Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance Between Water Pressure Gauge and Ground Surface
- **H2:** Distance Between Ground Surface and Ground Water Table
**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**
**SCIENTISTS AND ENGINEERS**

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Sara Covelli

**BORING NO./TEST NO.**
MW-67 T3 CH

**PROJECT LOCATION**
Indian Point

**GROUND SURFACE EL. (FT)**
14.356

**DATE START/END**
8/9/07

**DIAMETER OF DRILLED BOREHOLE**
3.83 INCH

**GROUND WATER DEPTH**
13.12 (below grade)

**Casing is 0.15 ft above ground.**

---

**PACKER TEST LOG**

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<tr>
<th>TIME (HR:MIN:SEC)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (ΔH FT)</th>
<th>PUMPING RATE (gpm/ft)</th>
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</table>

**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **P** - PACKER INFLATION PRESSURE (psi + 50 psi)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**FLOW RATE**

**NITROGEN SUPPLY LINE**

**GROUND SURFACE ELEVATION**

**WATER FLOW DIRECTION**

**INFLATABLE PACKERS**

**PERFORATED PIPE**

**GZA**

**BORING NO./TEST NO.**
MW-67 T3 CH
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Dave Carter

**GZA ENG.:** Rick Ponti

**PROJECT LOCATION:** Indian Point

**FILE NO.:** 41.0017869.01

**DATE START/END:** 8/10/07

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 12.80 (below grade)

**I.D. OF DRILLING RODS:** 2 INCH

**FINAL BORING DEPTH:** 347.9 FT

**STANDARD BORING DEPTH:** 206.62 FT

**NITROGEN SUPPLY LINE:**

<table>
<thead>
<tr>
<th>TIME (HR:MIN)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (DF/FT)</th>
<th>RECOVERY RATE (DF/DT)</th>
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**NOTE:** Test zone was purged for 45 minutes before pump was turned off for recovery.
**Full Test Results**

- **Project Location**: Indian Point
- **Contractor**: Aquifer Drilling & Testing, Inc.
- **Foreman**: Dave Carter
- **Ground Surface EL (FT)**: 14.356
- **Datum**: NGVD 29
- **Final Boring Depth (FT)**: 347.9
- **Date Start/End**: 8/10/07
- **Ground Water Depth**: 12.80 (below grade)
- **Casing is 0.15 ft above ground.**
- **Diameter of Drilled Borehole**: 3.83 INCH
- **I.D. of Drilling Rods**: 2 INCH

### Pack Test Log

<table>
<thead>
<tr>
<th></th>
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**Note**: This test may not be valid due to short duration of drawdown stabilization.
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Rick Ponti

**PROJECT LOCATION**

Indian Point

**BORING COORDINATES**

N 46°31'.27" W 6°44'.00"

**DATE START/END**

8/14/07

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**I.D. OF DRILLING RODS**

2 INCH

---

<table>
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<tr>
<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (QH FT)</th>
<th>RECOVERY RATE (QH/DT)</th>
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<tr>
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<tr>
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**GZA**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**FILE NO.**

41.0017869.01

---

**LEGEND:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA**

BORING NO./TEST NO. MW-67 T4A
### PACKER TEST LOG

**Client:** Entergy  
**Project Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter

**GZA ENG.:** Rick Ponti

**Location:** 440 Ninth Avenue, 18th Floor  
**File No.:** 41.0017869.01  
**Date Start/End:** 8/14/07

**Drilled Borehole Diameter:** 3.83 inch  
**I.D. of Drilling Rods:** 2 inch

<table>
<thead>
<tr>
<th>Time (HR:MIN:SEC)</th>
<th>Depth under Water (FT)</th>
<th>Drawdown (Δ FT)</th>
<th>Pumping Rate (gpm/ft)</th>
<th>Specific Capacity (gpm)</th>
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</thead>
<tbody>
<tr>
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<td>48.662</td>
<td>1.100</td>
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<td>61.87</td>
<td>48.826</td>
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<tr>
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</tr>
</tbody>
</table>

**NITROGEN SUPPLY LINE**  
**FLOW RATE**

**GWT =** Distance between ground water table and ground surface  
**G2 =** Distance between static water level depth and ground surface  
**H1 =** Distance between ground surface and top of the test zone  
**H2 =** Distance between ground surface and ground water table  

**Legend:**  
- **A:** Total length of test section (FT)  
- **BP:** Total length of bottom packer and assembly  
- **TP:** Total length of top packer and assembly  
- **D:** Distance between ground surface and top of the test zone  
- **PIP:** Packers inflation pressure (D PSI + 50 PSI)  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table

---

**LEGEND:**  
- **A:** Total length of test section (FT)  
- **BP:** Total length of bottom packer and assembly  
- **TP:** Total length of top packer and assembly  
- **D:** Distance between ground surface and top of the test zone  
- **PIP:** Packers inflation pressure (D PSI + 50 PSI)  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table
### PACKER TEST LOG

**Client:** Energy
**Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.
**Foreman:** Dave Carter
**Engineer:** Rick Ponti

**Boring No./Test No.:** MW-67 T5A
**File No.:** 41.0017869.01

**Boring Coordinates:**
- North: 463127.0611
- East: 604426.6654
- Datum: NGVD 29
- Date: 8/13/07

**Final Boring Depth:** 347.9 ft

**Drilled Borehole Diameter:** 3.83 inches
**I.D. of Drilling Rods:** 2 inches

<table>
<thead>
<tr>
<th>TESTED INTERVAL FROM TO (FT)</th>
<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (Δt MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/Δt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>296.6-311.4</td>
<td>14:49:00</td>
<td>0.0</td>
<td>238.51</td>
<td>25.30</td>
<td>0.0</td>
<td>-</td>
</tr>
<tr>
<td>L= 14.8 ft</td>
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<td>0.5</td>
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<td>22.00</td>
<td>3.30</td>
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<td>16.79</td>
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<td>249.995</td>
<td>13.82</td>
<td>11.49</td>
<td>2.29700</td>
</tr>
</tbody>
</table>

**Legend:**
- **A:** Total length of test section (ft)
- **TP:** Total length of top packer and assembly
- **BP:** Total length of bottom packer and assembly
- **D:** Distance between ground surface and top of the test zone
- **P:** Packers
- **PWP:** Packers Inflation Pressure (PSI)

**Other Measurements:**
- **L2:** Distance between water pressure gauge and ground surface
- **L1:** Distance between ground surface and ground water table

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 Ninth Avenue, 18th Floor
New York, New York 10001

**Site Scientists and Engineers:**
- GZA Environmental of New York
- Entergy Indian Point Energy Center
- Buchanan, NY

**Supplied Water:**
- Static water level depth
- **H2:** Distance between ground surface and ground water table
- **H1:** Distance between water pressure gauge and ground surface

**Legend:**
- **A:** Total length of test section (ft)
- **TP:** Total length of top packer and assembly
- **BP:** Total length of bottom packer and assembly
- **D:** Distance between ground surface and top of the test zone
- **P:** Packers
- **PWP:** Packers Inflation Pressure (PSI)

**Notes:**
- Casing is 15 ft above ground.
- Time Water Recovery Rate
- Nitrogen Supply Line
- Flow Rate
- Water Flow Direction
- Ground Surface Elevation
- Inflatable Packers
- Perforated Pipe
### Packard Test Log

**Client:** Entergy  
**Location:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter  
**GZA Eng.:** Rick Ponti

**Project Location:** Indian Point

**Test Boring No./Test No.:** MW-67 T5A CH

**Coordinates:** N 463127.0611  
**E 604426.6654**

**Final Boring Depth (ft):** 347.9  
**Date Start/End:** 8/13/07  
**Ground Surface El. (ft):** 14.356  
**Datum:** NGVD 29

**Diameter of Drilled Borehole:** 3.83 inch  
**Ground Water Depth:** 12.78 ft (below grade)  
**Casing:** 0.15 ft above ground.

**I.D. of Drilling Rods:** 2 inch

### Test Log Data

<table>
<thead>
<tr>
<th>Time (HR:MIN)</th>
<th>Elapsed Time</th>
<th>Depth Under Water (ft)</th>
<th>Depth to Water (ft)</th>
<th>Drawdown (f507H ft)</th>
<th>Pumping Rate (gpm/ft)</th>
<th>Specific Capacity (gpm/ft)</th>
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</thead>
<tbody>
<tr>
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<td>11.982</td>
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<td>0.108</td>
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<td>239.048</td>
<td>24.76</td>
<td>11.982</td>
<td>1.300</td>
<td>0.108</td>
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<td>238.725</td>
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<td>12.305</td>
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<td>0.105</td>
</tr>
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</table>

**Notes:** Due to short duration of stabilized drawdown, test may not be valid.

---

**Legend:**
- **A:** Total length of test section (ft)  
- **TP:** Total length of top packer and assembly  
- **BP:** Total length of bottom packer and assembly  
- **D:** Distance between ground surface and the test zone  
- **PIP:** Pack ARR INFLATION PRESSURE (D PSI + 50 PSI)  
- **H1:** Distance between water pressure gauge and ground surface  
- **H2:** Distance between ground surface and ground water table

---

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 Ninth Avenue, 18th Floor  
New York, New York 10001  
Scientists and Engineers
<table>
<thead>
<tr>
<th>TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (QH FT)</th>
<th>RECOVERY RATE (QH/Δt)</th>
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<tbody>
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<td>30.98</td>
<td>3.51</td>
<td>7.03000</td>
</tr>
<tr>
<td>14:40:30</td>
<td>222.652</td>
<td>28.69</td>
<td>5.81</td>
<td>5.81100</td>
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<tr>
<td>14:41:00</td>
<td>224.374</td>
<td>26.97</td>
<td>7.53</td>
<td>5.02200</td>
</tr>
<tr>
<td>14:41:30</td>
<td>225.952</td>
<td>25.39</td>
<td>9.11</td>
<td>4.55550</td>
</tr>
<tr>
<td>14:42:30</td>
<td>228.643</td>
<td>22.70</td>
<td>11.80</td>
<td>3.93400</td>
</tr>
<tr>
<td>14:43:30</td>
<td>228.212</td>
<td>23.13</td>
<td>11.37</td>
<td>2.84275</td>
</tr>
<tr>
<td>14:44:30</td>
<td>230.867</td>
<td>20.47</td>
<td>14.03</td>
<td>2.60520</td>
</tr>
<tr>
<td>14:45:30</td>
<td>233.773</td>
<td>17.57</td>
<td>16.93</td>
<td>2.82200</td>
</tr>
<tr>
<td>14:46:30</td>
<td>234.922</td>
<td>16.42</td>
<td>18.08</td>
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<tr>
<td>14:47:30</td>
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<td>15.45</td>
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<td>14:48:30</td>
<td>236.536</td>
<td>14.80</td>
<td>19.70</td>
<td>2.18833</td>
</tr>
</tbody>
</table>

**Legend:**
- **A:** Total length of test section (FT)
- **TP:** Total length of top packer and assembly
- **BP:** Total length of bottom packer and assembly
- **D:** Distance between ground surface and top of the test zone
- **PIP:** Pack Int Pressure (D PSI + 50 PSI)
- **H1:** Distance between water pressure gauge and ground surface
- **H2:** Distance between ground surface and ground water table

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 Ninth Avenue, 18th Floor
New York, New York 10001

**Scientists and Engineers**

Entergy Indian Point Energy Center
Buchanan, NY

**Packers Test Log**

<table>
<thead>
<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
<th>Cumulative Recovery (QH FT)</th>
<th>Recovery Rate (QH/Δt)</th>
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<tbody>
<tr>
<td>284.6-299.4</td>
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<td>34.50</td>
<td>0.00</td>
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<tr>
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<td>3.51</td>
<td>7.03000</td>
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<tr>
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<tr>
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<tr>
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<td>14.03</td>
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<td>14.80</td>
<td>19.70</td>
<td>2.18833</td>
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</tr>
</tbody>
</table>
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client

Entergy
Indian Point Energy Center
Buchanan, NY

BORING NO./TEST NO.
MW-67 T6 CH

CONTRACTOR
Aquifer Drilling & Testing, Inc.

FOREMAN
Dave Carter

GZA ENG.
Rick Ponti

DIAMETER OF DRILLED BOREHOLE
3.83 inch

I.D. OF DRILLING RODS
2 inch

GROUND SURFACE EL. (FT)
14.356

FINAL BORING DEPTH (FT)
347.9

DATE START/END
8/14/07

DIAMETER OF PERFORATED PIPE
3.83 inch

GROUND WATER DEPTH
12.04 (below grade)

DATE OF REPORT
8/28/07

DIAMETER OF INFATURABLE PACKERS
0.15 ft above ground

LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

TIME
ElAPSED TIME
DEPTH UNDER WATER
DEPTH TO WATER
DRAWDOWN
PUMPING RATE
SPECIFIC CAPACITY
(Ft/min)
(gpm/ft)

284.6-299.4
15:00 0 211.963 39.38 27.337 1.000 0.037
15:01 1 211.856 39.48 27.444 1.000 0.036
15:02 2 211.82 39.52 27.48 1.000 0.036
15:03 3 211.82 39.52 27.48 1.000 0.036
15:04 4 211.82 39.52 27.48 1.000 0.036
15:05 5 211.748 39.59 27.552 1.000 0.036
15:06 6 211.712 39.63 27.588 1.000 0.036
15:07 7 211.748 39.59 27.552 1.000 0.036
15:08 8 211.712 39.63 27.588 1.000 0.036
15:09 9 211.712 39.63 27.588 1.000 0.036
15:10 10 211.712 39.63 27.588 1.000 0.036
15:11 11 211.712 39.63 27.588 1.000 0.036
15:12 12 211.712 39.63 27.588 1.000 0.036
15:13 13 211.748 39.59 27.552 1.000 0.036
15:14 14 211.748 39.59 27.552 1.000 0.036
15:15 15 211.676 39.66 27.624 1.000 0.036
15:16 16 211.605 39.74 27.695 1.000 0.036
15:17 17 211.569 39.77 27.731 1.000 0.036
15:18 18 211.605 39.74 27.695 1.000 0.036
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**

**NEW YORK, NEW YORK 10001**

**CLIENT:** Entergy

**PROJECT LOCATION:** Indian Point

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Dave Carter

**GZA ENG.:** Rick Ponti

**DIAmETER OF DRILLED BOREHOLE:** 3.83 INCH

**GROUND WATER DEPTH:** 13.22 (below grade)

**Casing is 0.15 ft above ground.**

---

**I.D. OF DRILLING RODS:** 2 INCH

**TIME ELAPSED DEPTH TO PUMPING SPECIFIC NITROGEN SUPPLY LINE**

<table>
<thead>
<tr>
<th>TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (24H FT)</th>
<th>PUMPING RATE (gpm/ft)</th>
<th>SPECIFIC CAPACITY (gpm/ft)</th>
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<tbody>
<tr>
<td>11:12</td>
<td>25.701</td>
<td>14.56</td>
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**LEGEND:**

- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **TP:** TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (0 PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**Note:** Due to inconclusive behavior observed in groundwater levels following this test, results were not analyzed.

---

**GZA**

**BORING NO./TEST NO.: MW-67 T7 CH**

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.

**FOREMAN:** Dave Carter

**GZA ENG.:** Rick Ponti

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH

---

**GROUND WATER DEPTH:** 13.22 (below grade)

**Casing is 0.15 ft above ground.**

---

**I.D. OF DRILLING RODS:** 2 INCH

**TIME ELAPSED DEPTH TO PUMPING SPECIFIC NITROGEN SUPPLY LINE**

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<td>1.59</td>
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</tbody>
</table>

---

**NOTE:** Due to inconclusive behavior observed in groundwater levels following this test, results were not analyzed.
## PACKER TEST LOG

### Client
Entergy Indian Point Energy Center

### Project Location
Buchanan, NY

### Contractor
Aquifer Drilling & Testing, Inc.

### Client Information

- **BORING NO. / TEST NO.**: MW-67 T8 CH
- **Sheet**: 1 of 1
- **File No.**: 4100176601
- **Project Location**: Indian Point

### Boring Coordinates
- **N**: 463127.0611
- **E**: 604426.6654
- **Datum**: NGVD 29

### Foreman
Dave Carter

### GZA Eng.
Rick Ponti

### Drilling Details
- **Diameter of Drilled Borehole**: 3.83 INCH
- **Ground Water Depth**: 11.65 (below grade)
- **Casing is 0.15 ft above ground**
- **Ground Surface EL. (FT)**: 14.356

### Table: Flow Rate

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<tr>
<th>Tested Interval From / To (FT)</th>
<th>Time (HR:MIN:SEC)</th>
<th>Elapsed Time (Δ Min)</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
<th>Drawdown (Δ FT)</th>
<th>Pumping Rate (gpm/ft)</th>
<th>Specific Capacity (gpm/ft)</th>
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### Diagram Legends
- **A**: Total Length of Test Section (FT)
- **BP**: Total Length of Bottom Pack and Assembly
- **TP**: Total Length of Top Pack and Assembly
- **D**: Distance Between Ground Surface and Top of the Test Zone
- **PIP**: Pack Inflation Pressure (D PSI + 50 PSI)
- **H1**: Distance Between Water Pressure Gauge and Ground Surface
- **H2**: Distance Between Ground Surface and Ground Water Table

### Notes
- Casing is 0.15 ft above ground.
## PACKER TEST LOG

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Boring/Test No.
MW-67 T9 CH

### Coordinates
N 463,127.0611
E 604,426.6654

### Final Boring Depth (ft)
347.9

### Date
8/16/07

### Ground Water Depth (below grade)
13.62 ft

### Casing
0.15 ft above ground

### Diameter of Drilled Borehole
3.83 inch

### I.D. of Drilling Rods
2 inch

### Test Section
A - Total Length of Test Section (ft) = 14.8 ft

### Top and Bottom Packers
TP - Total Length of Top Packer and Assembly = 19.9 ft
BP - Total Length of Bottom Packer and Assembly = 3.85 ft

### Distance
D - Distance Between Ground Surface and Top of the Test Zone = 249.6 ft
P - Packeter Inflation Pressure (psi + 50 psi) = 225 psi
H1 - Distance Between Water Pressure Gauge and Ground Surface = 216.7 ft
H2 - Distance Between Ground Surface and Ground Water Table = 13.62 ft

### Test Data

<table>
<thead>
<tr>
<th>Time</th>
<th>Elapsed Time (Min)</th>
<th>Depth Under Water (ft)</th>
<th>Depth to Water (ft)</th>
<th>Drawdown (ft)</th>
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### Diagram

- **LEGEND:**
  - A - Total Length of Test Section (FT)
  - TP - Total Length of Top Packer and Assembly
  - BP - Total Length of Bottom Packer and Assembly
  - D - Distance Between Ground Surface and Top of the Test Zone
  - PIP - Packeter Inflation Pressure (D PSI + 50 PSI)
  - H1 - Distance Between Water Pressure Gauge and Ground Surface
  - H2 - Distance Between Ground Surface and Ground Water Table

### GZA
GZA GeoEnvironmental of New York
440 Ninth Avenue, 18th Floor
New York, New York 10001

---

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## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**  
440 NINTH AVENUE, 18th FLOOR  
NEW YORK, NEW YORK 10001  
SCIENTISTS AND ENGINEERS

---

**Client**  
Entergy  
Indian Point Energy Center  
Buchanan, NY

---

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Dave Carter

**GZA ENG.**  
Rick Ponti

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

**GROUND WATER DEPTH (STATIC WATER LEVEL DEPTH)**  
12.41 (below grade)

---

**I.D. OF DRILLING RODS**  
2 INCH

---

**PROJECT LOCATION**  
Indian Point

---

**BOARING NO./TEST NO.**  
MW-67 T10

---

**FILE NO.**  
41.0017869.01

---

**CONTRACTOR**  
Aquifer Drilling & Testing, Inc.

**FOREMAN**  
Dave Carter

**GZA ENG.**  
Rick Ponti

**DIAMETER OF DRILLED BOREHOLE**  
3.83 INCH

---

**GROUND WATER DEPTH**  
12.41 (below grade)

---

**Casing is 0.15 ft above ground.**

---

### Table: Test Log

<table>
<thead>
<tr>
<th>Tested Interval From/To (FT)</th>
<th>Time (HR:MIN)</th>
<th>Elapsed Time (hr:Min)</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
<th>Cumulative Recovery (QH/FT)</th>
<th>Recovery Rate (QP/QH)</th>
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**Legend:**

- **A**: Total Length of Test Section (FT)  
- **TP**: Total Length of Top Packers and Assembly  
- **BP**: Total Length of Bottom Packers and Assembly  
- **D**: Distance Between Ground Surface and Top of the Test Zone  
- **PIP**: Packers Inflation Pressure (D PSI + 50 PSI)  
- **H1**: Distance Between Water Pressure Gauge and Ground Surface  
- **H2**: Distance Between Ground Surface and Ground Water Table

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**Ground Surface Elevation (H2):**

**Water Flow Direction:**

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**Perforated Pipe:**

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**Blocks:**

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**Notes:**

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**DIAGRAM:**

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**GZA GEOENVIRONMENTAL OF NEW YORK**

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**Boring No./Test No.**  
MW-67 T10

---

**File No.**  
41.0017869.01
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Rick Ponti

**PROJECT LOCATION**

Indian Point

**BORING NO./TEST NO.**

MW-67 T11

**DATE START/END**

8/17/07

**GROUND SURFACE EL. (FT)**

14.356

**FINAL BORING DEPTH (FT)**

347.9

**DATE START/END**

8/17/07

**GROUND WATER DEPTH**

13.30 (below grade)

**DIAMETER OF DRILLED BOREHOLE**

3.83 INCH

**GZ**

A BORING NO./TEST NO. MW-67 T11

#### TESTED INTERVAL FROM / TO (FT)

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<th>TIME</th>
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<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (Q/H FT)</th>
<th>RECOVERY RATE (Q/H(ΔH))</th>
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**LEGEND:**

- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **H2** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

**FLOW RATE**

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<th>WATER RECOVERY RATE</th>
<th>TIME WATER RECOVERY RATE</th>
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## PACKER TEST LOG

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<tr>
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<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/Δt)</th>
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**LEGEND:**
- **A** - Total length of test section (ft)
- **TP** - Total length of top packer and assembly
- **BP** - Total length of bottom packer and assembly
- **D** - Distance between ground surface and top of the test zone
- **PIP** - Packer inflation pressure (D PSI + 50 PSI)
- **H1** - Distance between water pressure gauge and ground surface
- **H2** - Distance between ground surface and ground water table

**Notes:**
- Static water level depth
- Diameter of drilled borehole: 3.83 inch
- Ground water depth (below grade): 12.99 ft
- Casing is 0.15 ft above ground.
- Ground surface elevation
- Water flow direction
- Nitrogen supply line
- Flow rate
- Packager inflation pressure
- Inflatable packers
- Perforated pipe
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**PROJECT LOCATION**
Indian Point

<table>
<thead>
<tr>
<th>BORING NO./TEST NO.</th>
<th>MW-67 T13</th>
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<td>LOCATION</td>
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**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Rick Ponti

**BORING NO./TEST NO.**
MW-67 T13

**BOARING COORDINATES**
N 463127.0611 E 564426.6654

**DATE**
8/20/07

**FINAL BORING DEPTH (FT)**
347.9

**GROUND WATER DEPTH**
13.59 (below grade)

**Diameter of Drilled Borehole**
3.83 INCH

**Ground Surface EL. (FT)**
14.356 DATUM NGVD 29

**Casing**
0.15 ft above ground.

**I.D. of Drilling Rods**
2 INCH

### TIME, ELAPSED TIME, DEPTH UNDERTER WATER, DEPTH TO WATER, CUMULATIVE RECOVERY, RECOVERY RATE

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<th>ELAPSED TIME (MIN)</th>
<th>DEPTH UNDERT WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
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</table>

### Diagram

- **Nitrogen Supply Line**
- **Flow Rate**
- **Ground Surface Elevation**
- **Water Flow Direction**
- **Inflatable Packers**
- **Perforated Pipe**
- **Legend:**
  - A: Total Length of Test Section (FT)
  - TP: Total Length of Top Packers and Assembly
  - BP: Total Length of Bottom Packers and Assembly
  - D: Distance Between Ground Surface and Top of the Test Zone
  - PIP: Packers Inflation Pressure (D PSI + 50 PSI)
  - H1: Distance Between Water Pressure Gauge and Ground Surface
  - H2: Distance Between Ground Surface and Ground Water Table

**Legend Values:**
- A: 14.8 FT
- TP: 19.9 FT
- BP: 3.85 FT
- D: 170.1 FT
- PIP: 225 PSI
- H1: 136.2 FT
- H2: 13.59 FT
### PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Rick Ponti

**GZA GEOENVIRONMENTAL OF NEW YORK**

**PROJECT LOCATION**
Indian Point

**BORING NO./TEST NO.**
MW-67 T13 CH

**Boring Coordinates**
N 463127.0611 E 604426.6654

**Ground Surface EL.(FT)**
14.356

**Date Start/End**
8/20/07

**Final Boring Depth (FT)**
347.9

**Ground Water Depth (below grade)**
13.59

**Casing is 0.15 ft above ground.**

**Diameter of Drilled Borehole**
3.83 INCH

**I.D. of Drilling Rods**
2 INCH

### PACKER TEST LOG

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<thead>
<tr>
<th>Time (HR:MIN)</th>
<th>Time Elapsed (MIN)</th>
<th>Tested Depth Under Water (FT)</th>
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</table>

**LEGEND:**
- A - Total Length of Test Section (FT)
- TP - Total Length of Top Packer and Assembly
- BP - Total Length of Bottom Packer and Assembly
- D - Distance between Ground Surface and Top of the Test Zone
- PIP - Packer Inflation Pressure (D PSI + 50 PSI)
- H1 - Distance between Water Pressure Gauge and Ground Surface
- H2 - Distance between Ground Surface and Ground Water Table

**Flow Rate**

**Ground Surface Elevation**

**Ground Water Table (GWT)**

**Inflatable Packers**

**Perforated Pipe**

**GZA**
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**

**PROJECT LOCATION** Indian Point

**CONTRACTOR** Aquifer Drilling & Testing, Inc.

**FOREMAN** Dave Carter

**GZA ENG.** Rick Ponti

**DIAMETER OF DRILLED BOREHOLE** 3.83 INCH

**GROUND WATER DEPTH** 12.13 (below grade)

**Casing is 0.15 ft above ground.**

**I.D. OF DRILLING RODS** 2 INCH

---

**TESTED INTERVAL FROM / TO (FT)**

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<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
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</table>

**LEGEND:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

---

**GZA**

**BORING NO./TEST NO.** MW-67 T14A

---

---
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Center
Buchanan, NY

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter
GZA ENG.: Rick Ponti

BORING NO./TEST NO.: MW-67 T15A
BORING COORDINATES: N 463127.0611, E 604426.6654
GROUND SURFACE EL.: 14.356 FT
FINAL BORING DEPTH (FT): 347.9 FT
DATE START/END: 8/21/07

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 12.73 FT (below grade)
Casing is 0.15 ft above ground.

I.D. OF DRILLING RODS: 2 INCH
PACKER INFLATION PRESSURE: 200 PSI
TIME ELAPSED DEPTH TO CUMULATIVE RECOVERY

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<th>TIME</th>
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LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT): 14.8 FT
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY: 3.85 FT
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE: 133 FT
P - PACKER INFLATION PRESSURE (D PSI + 50 PSI): 200 PSI
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE: 99.3 FT
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE: 12.73 FT

GZA GEOENVIRONMENTAL OF NEW YORK
SCIENTISTS AND ENGINEERS
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

**440 NINTH AVENUE, 18th FLOOR**
**NEW YORK, NEW YORK 10001**
**SCIENTISTS AND ENGINEERS**

**Client**

Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Rick Ponti

**DIAMETER OF DRILLED BOREHOLE** 3.83 INCH

**I.D. OF DRILLING RODS** 2 INCH

**PROJECT LOCATION**
Indian Point

**BORING NO./TEST NO.** MW-67 T15A CH

**GROUND SURFACE EL.(FT)** 14.356

**FINAL BORING DEPTH (FT)** 347.9

**DATE START/END** 8/21/07

**GROUT WATER DEPTH** 12.73 (below grade)

**Casing is 0.15 ft above ground.**

**STATIC WATER LEVEL DEPTH**

**INFLATABLE PACKERS**

**TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY

**BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY

**D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE

**H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE

**H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

**Q** - WATER FLOW RATE

**INTERVAL TESTED DEPTH UNDER WATER (FT)**

**FROM / TO (FT)**

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<th>TIME</th>
<th>ELAPSED TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>DRAWDOWN (DH FT)</th>
<th>PUMPING RATE (gal/min)</th>
<th>SPECIFIC CAPACITY (gpm/ft)</th>
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**PACKER TEST LOG**

GZA GEONVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

Client: Entergy
Indian Point Energy Cente
Buchanan, NY

**CONTRACTOR:** Aquifer Drilling & Testing, Inc.
**FOREMAN:** Dave Carter
**GZA ENG.:** Rick Ponti

**GZA GEOENVIRONMENTAL OF NEW YORK**
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**FILE NO.:** 41.0017869.01
**PROJECT LOCATION:** Indian Point

**DATE START/END:** 8/24/07

**BORING NO./TEST NO.:** MW-67 T16

**DIAMETER OF DRILLED BOREHOLE:** 3.83 INCH
**GZ/ENG.:** Rick Ponti

**FOREMAN:** Dave Carter

**GROUND SURFACE EL.(FT):** 14.356

**DATE:** NO/VD 29

**TOTAL LENGTH OF TEST SECTION (FT):** 14.8 ft

**TOTAL LENGTH OF TOP PACKER AND ASSEMBLY:** 19.9 ft

**TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY:** 3.85 ft

**DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE:** 129.6 ft

**PACKER INFLATION PRESSURE:** 200 PSI

**DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE:** 126.4 ft

**DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE:** 13.08 ft

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<tr>
<th>TIME (HR:MIN)</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (Q FT)</th>
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**LEGEND:**
- **A:** TOTAL LENGTH OF TEST SECTION (FT)
- **BP:** TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D:** DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP:** PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1:** DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **H2:** DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Client**

Entergy
Indian Point Energy Center
Buchanan, NY

**CONTRACTOR**

Aquifer Drilling & Testing, Inc.

**FOREMAN**

Dave Carter

**GZA ENG.**

Rick Ponti

**PROJECT LOCATION**

Indian Point

**BORING NO./TEST NO.**

MW-67 T17

**FILE NO.**

41.0017889.01

**DATE START/END**

8/24/07

**GROUND WATER DEPTH**

13.24 ft

**STATIC WATER LEVEL DEPTH**

Casing is 0.15 ft above ground.

**I.D. OF DRILLING RODS**

2 inch

### Table

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<tr>
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<th>TIME (HR:MIN)</th>
<th>ELAPSED TIME (ΔT MIN)</th>
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<th>DEPTH TO WATER (FT)</th>
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**LEGEND:**
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **PIP** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
## PACKER TEST LOG

### Client
Entergy Indian Point Energy Center
Buchanan, NY

### Project Information
- **Location:** Indian Point
- **File No.:** 41.0017869.01
- **Contractor:** Aquifer Drilling & Testing, Inc.
- **Foreman:** Dave Carter
- **GZA Eng.:** Rick Ponti
- **Date Start/End:** 8/21/07
- **Final Boring Depth:** 347.9 ft
- **Ground Water Depth:** 12.78 ft below grade

### Drilling Details
- **Diameter of Drilled Borehole:** 3.83 inch
- **I.D. of Drilling Rods:** 2 inch

### Test Log

<table>
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<tr>
<th>Time (HR:MIN)</th>
<th>Time Elapsed (ΔT Min)</th>
<th>Depth Under Water (FT)</th>
<th>Depth to Water (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
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**Legend:**
- **A:** Total Length of Test Section (FT)
- **TP:** Total Length of Top Packers and Assembly
- **BP:** Total Length of Bottom Packers and Assembly
- **D:** Distance between Ground Surface and Top of the Test Zone
- **PIP:** Packers Inflation Pressure (D PSI + 50 PSI)
- **H1:** Distance between Water Pressure Gauge and Ground Surface
- **H2:** Distance between Ground Surface and Ground Water Table

**Dimensions:**
- **L= 14.8 ft**
- **H1= 66.1 ft**
- **H2= 12.78 ft**
- **PIP= 180 PSI**
- **TP= 14.8 FT**
- **BP= 19.9 FT**
- **A= 3.85 FT**
- **D= 100.0 FT**

---

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

GZA SCIENTISTS AND ENGINEERS
Entergy
Indian Point Energy Center
Buchanan, NY
## PACKER TEST LOG

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

**Scientists and Engineers**

**Client**

Entergy

**Boring No./Test No.** MW-67 T18A CH

**Location**

Indian Point Energy Center

**Contractor**

Aquifer Drilling & Testing, Inc.

**Foreman**

Dave Carter

**GZA Eng.**

Rick Ponti

**File No.** 41.0017869.01

**Date Start/End** 8/21/07

**Ground Water Depth** 12.78 ft (below grade)

**Casing** is 0.15 ft above ground.

**Drilled Borehole Diameter** 3.83 in

**ID of Drilling Rods** 2 in

### PACKER TEST LOG

<table>
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<tr>
<th>TIME (HR:MIN:SEC)</th>
<th>TESTED INTERVAL FROM / TO (FT)</th>
<th>TIME ELAPSED (H:MIN:SEC) Δ MIN</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
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**Legend:**

- **A** - Total length of test section (ft)
- **TP** - Total length of top packer and assembly
- **BP** - Total length of bottom packer and assembly
- **D** - Distance between ground surface and top of the test zone
- **P** - Packers
- **H1** - Distance between water pressure gauge and ground surface
- **H2** - Distance between ground surface and ground water table

**Notes:**

- N 463127.0611 E 604426.6654
- Datum NGVD 29
- Casing is 0.15 ft above ground.

**Diagram:**

- Ground surface elevation
- Water flow direction
- Nitrogen supply line
- Packer inflation pressure
- Flow rate
- Inflatable packers
- Perforated pipe
- TP - Total length of top packer and assembly
- BP - Total length of bottom packer and assembly
- D - Distance between ground surface and top of the test zone
- PIP - Packer inflation pressure (D PSI + 50 PSI)
- H1 - Distance between water pressure gauge and ground surface
- H2 - Distance between ground surface and ground water table

**Client Boring No./Test No.** MW-67 T18A CH
### PACKER TEST LOG

**Client**: Indian Point Energy Centre  
**Location**: Buchanan, NY  
**Contractor**: Aquifer Drilling & Testing, Inc.  
**Foreman**: Dave Carter  
**Engineer**: Rick Ponti  
**Date Start/End**: 8/25/07

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<th>TIME</th>
<th>INTERVAL</th>
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<th>DEPTH TO WATER (FT)</th>
<th>Cumulative Recovery (ΔH FT)</th>
<th>Recovery Rate (ΔH/Δt)</th>
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**Legend**:
- A - Total length of test section (ft)
- TP - Total length of top packer and assembly
- BP - Total length of bottom packer and assembly
- D - Distance between ground surface and top of the test zone
- PIP - Packer inflation pressure (D PSI + 50 PSI)
- H1 - Distance between water pressure gauge and ground surface
- H2 - Distance between ground surface and ground water table
### PACKER TEST LOG

#### GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

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| CONTRACTOR | Aquifer Drilling & Testing, Inc. | BORING NO./TEST NO. | MW-67 T20A |
| FOREMAN | Dave Carter | BORING COORDINATES | N 46°31'27.0001 E 60°44'26.6654 |
| GZA ENG. | Rick Ponti | DATE START/END | 8/22/07 |
| DIAMETER OF DRILLED BOREHOLE | 3.83 INCH |
| GROUND WATER DEPTH | 12.75 FT (below grade) |
| Casing is | 0.15 ft above ground. |
| I.D. OF DRILLING RODS | 2 INCH |

#### TESTED INTERVAL FROM / TO (FT)

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<tr>
<th>TIME</th>
<th>ELAPSED TIME</th>
<th>DEPTH UNDER WATER (FT)</th>
<th>DEPTH TO WATER (FT)</th>
<th>CUMULATIVE RECOVERY (ΔH FT)</th>
<th>RECOVERY RATE (ΔH/Δt)</th>
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#### LEGEND:
- **A** - TOTAL LENGTH OF TEST SECTION (FT)
- **TP** - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- **BP** - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- **D** - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- **P** - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- **H1** - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
- **H2** - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- **Q** - FLOW RATE
- **P** - NITROGEN SUPPLY LINE
- **Q** - WATER FLOW DIRECTION

---

**Note:**
- **STATIC WATER LEVEL DEPTH**
- **GROUND SURFACE ELEVATION**
**PACKER TEST LOG**

**GZA GEOENVIRONMENTAL OF NEW YORK**

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

**Client**
Entergy
Indian Point Energy Center
Buchanan, NY

**BORING NO./TEST NO.**
MW-67 T21A

**CONTRACTOR**
Aquifer Drilling & Testing, Inc.

**FOREMAN**
Dave Carter

**GZA ENG.**
Rick Ponti

**PROJECT LOCATION**
Indian Point

**Client**
Entergy
Indian Point Energy Center

**I.D. OF DRILLED BOREHOLE**
3.83 INCH

**GROUND WATER DEPTH**
13.23 (below grade)  Casing is 0.15 ft above ground.

**INTERVAL**

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**LEGEND:**

- A - TOTAL LENGTH OF TEST SECTION (FT)
- TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
- BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
- D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
- PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
- H1 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE
- H2 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
PACKER TEST LOG

GZA GEOENVIRONMENTAL OF NEW YORK
440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001
SCIENTISTS AND ENGINEERS

Client: Entergy
Project Location: Indian Point
GZA ENG. Rick Ponti

CONTRACTOR: Aquifer Drilling & Testing, Inc.
FOREMAN: Dave Carter

DIAMETER OF DRILLED BOREHOLE: 3.83 INCH
GROUND WATER DEPTH: 13.36 (below grade)
Casing is 0.15 ft above ground.

I.D. OF DRILLING RODS: 2 INCH

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LEGEND:
A - TOTAL LENGTH OF TEST SECTION (FT)
TP - TOTAL LENGTH OF TOP PACKER AND ASSEMBLY
BP - TOTAL LENGTH OF BOTTOM PACKER AND ASSEMBLY
D - DISTANCE BETWEEN GROUND SURFACE AND TOP OF THE TEST ZONE
PIP - PACKER INFLATION PRESSURE (D PSI + 50 PSI)
H1 - DISTANCE BETWEEN WATER PRESSURE GAUGE AND GROUND SURFACE
H2 - DISTANCE BETWEEN GROUND SURFACE AND GROUND WATER TABLE

GZA GEOENVIRONMENTAL OF NEW YORK
### PACKER TEST LOG

**Client:** Entergy  
**Address:** Indian Point Energy Center, Buchanan, NY

**Contractor:** Aquifer Drilling & Testing, Inc.  
**Foreman:** Dave Carter  
**Eng.:** GZA ENG. Rick Ponti

**Boring Coordinates:**  
N 463127.0611, E 604426.6654, Datum NGVD 29

**Final Boring Depth (ft):** 347.9  
**Date Start/End:** 8/25/07

**Ground Water Depth:** 13.56 ft (below grade)  
Casing is 0.15 ft above ground.

**I.D. of Drilling Rods:** 2 inch

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<th>Elapsed Time (ΔT Min)</th>
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<th>Cumulative Recovery (ΔH ft)</th>
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**Legend:**  
- A - Total Length of Test Section (ft)  
- TP - Total Length of Top Packers and Assembly  
- BP - Total Length of Bottom Packers and Assembly  
- D - Distance Between Ground Surface and Top of the Test Zone  
- Pip - Packers Inflation Pressure (D PSI + 50 PSI)  
- H1 - Distance Between Water Pressure Gauge and Ground Surface  
- H2 - Distance Between Ground Surface and Ground Water Table

**Flow Rate:**

- Nitrogen Supply Line
- Ground Surface Elevation
- Water Flow Direction

**Diagram:**

- Inflatable Packers
- Perforated Pipe

**Engineers:** GZA GEOENVIRONMENTAL OF NEW YORK

**Scientists and Engineers:**

GZA

**File No.:** 41.0017869.01  
**Project Location:** Indian Point

**Client file No.:** 41.0017869.01  
**Sheet:** 1 of 1
## PACKER TEST LOG

### GZA GEOENVIRONMENTAL OF NEW YORK

440 NINTH AVENUE, 18th FLOOR
NEW YORK, NEW YORK 10001

### Client
Entergy
Indian Point Energy Center
Buchanan, NY

### Project Location
Indian Point

### Contractor
Aquifer Drilling & Testing, Inc.

### Foreman
Dave Carter

### GZA Eng.
Rick Ponti

### Boring No./Test No.
MW-67 T24

### Boring Coordinates
N 463127.0611  E 604426.6654

### Datum
NGVD 29

### Final Boring Depth (FT)
347.9

### Date Start/End
8/25/07

### Diameter of Drilled Borehole
3.83 INCH

### Ground Water Depth
13.61 (below grade)

### Casing
0.15 ft above ground

### Static Water Level Depth

### I.D. of Drilling Rods
2 INCH

### Diameter of Drill Rods
2 INCH

### Packers
INFLATABLE PACKERS

### Perforated Pipe

### Legend:
- A - Total Length of Test Section (FT)
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<th>Tested Interval From/To (FT)</th>
<th>Time</th>
<th>Elapsed Time (HR:MIN)</th>
<th>Depth Under Water (FT)</th>
<th>Depth To Water (FT)</th>
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### Ground Water Table

### Water Flow Direction

### Flow Rate

### Nitrogen Supply Line

### Ground Surface Elevation

### Water Pump

### Inflatable Packers

### Perforated Pipe

### Diagram Legends:
- A - Total Length of Test Section (FT)
- TP - Total Length of Top Packers and Assembly
- BP - Total Length of Bottom Packers and Assembly
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- H1 - Distance Between Water Pressure Gauge and Ground Surface
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