

STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES  
**BENEFICIAL USE FIELD REPORT**

**RECEIVED****JUL 30 2019**DEPARTMENT OF  
WATER RESOURCES

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

**A. GENERAL INFORMATION**Permit No. 65-22945

1. Owner The McCall Associates, LLC Phone No. 208-350-1252  
Current address P.O. Box 1017, Boise, ID 83707
2. Examiner's name Terry Scanlan, CWRE No. 129 EXAM DATE July 15, 2009
3. Accompanied by Warren Drake Email wdrake@drakediversified.com  
Address \_\_\_\_\_  
Relationship to permit holder contract water system operator Phone No. 208-573-6261
4. Source Ground Water tributary to \_\_\_\_\_

**B. OVERLAP REVIEW**

1. Other water rights with the same place of use 65-22960, 65-7576C, 65-7576D, 65-7653E
2. Other water rights with the same source and point of diversion 65-22960, Permit 65-23042

**C. DIVERSION AND DELIVERY SYSTEM**

## 1. Point(s) of Diversion:

| Ident. No. | Gov't Lot | ¼ | ¼  | ¼  | Sec | Twp | Rge | County | Method of Determination/Remarks |
|------------|-----------|---|----|----|-----|-----|-----|--------|---------------------------------|
|            | L1        |   | SE | SE | 25  | 18N | 2E  | Valley | 2015 Photo, Exam, GPS           |
|            | L1        |   | SE | SE | 25  | 18N | 2E  | Valley | 2015 Photo, Exam, GPS           |
|            |           |   |    |    |     |     |     |        |                                 |
|            |           |   |    |    |     |     |     |        |                                 |

2. Place(s) of Use: Method of determination 2015 Photo, Exam

| Twp | Rge | Sec | NE |    |    |    | NW |    |    |    | SW |     |     |    | SE |    |    |    | Totals |
|-----|-----|-----|----|----|----|----|----|----|----|----|----|-----|-----|----|----|----|----|----|--------|
|     |     |     | NE | NW | SW | SE | NE | NW | SW | SE | NE | NW  | SW  | SE | NE | NW | SW | SE |        |
| 18N | 2E  | 25  |    |    |    |    |    |    |    |    |    |     |     | D  | D  | D  | D  | D  |        |
|     |     |     |    |    |    |    |    |    |    |    |    |     |     |    |    |    |    | L1 |        |
|     |     | 36  | D  |    |    |    |    |    |    |    |    |     |     |    |    |    |    |    |        |
|     |     |     | L2 |    |    |    |    |    |    |    |    |     |     |    |    |    |    |    |        |
| 18N | 3E  | 30  |    |    |    |    |    |    |    |    |    | D   | D   |    |    |    |    |    |        |
|     |     |     |    |    |    |    |    |    |    |    |    | L11 | L11 |    |    |    |    |    |        |
|     |     |     |    |    |    |    |    |    |    |    |    |     |     |    |    |    |    |    |        |

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.

Scale: 1" = \_\_\_\_\_

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)  
☒ Aerial photo attached (required for irrigation of 10+ acres)  
☒ Photo of diversion and system attached

4.

| Well or Diversion Identification No.* | Motor Make        | Hp  | Motor Serial No. | Pump Make       | Pump Serial No. or Discharge Size |
|---------------------------------------|-------------------|-----|------------------|-----------------|-----------------------------------|
| Well #1                               | Franklin Electric | 40  | 236617           | Berkeley 7T-450 | 5"                                |
| Well #2                               | Franklin Electric | 15  | 236613           | Berkeley 6T-225 | 4"                                |
| Well #2                               | Franklin Electric | 100 | 239604           | Berkeley 8T-900 | 6"                                |

\*Code to correspond with no. on map and aerial photo

#### D. FLOW MEASUREMENTS

1.

| Measurement Equipment | Type | Make    | Model No. | Serial No. | Size | Calib. Date |
|-----------------------|------|---------|-----------|------------|------|-------------|
| flow meter            | mag  | McCrom. | Ultra Mag | UM20060180 | 4"   | 2006        |
|                       |      |         |           |            |      |             |

2. **Measurements:** \_\_\_\_\_

Stable flow (15 min) of 850 gpm at 42 psi discharge pressure with 40-hp and 15-hp pumps only (100-hp pump off).

Maximum flow (open discharge) with 40-hp and 15-hp pumps only (100-hp pump off) was 930 gpm at 15 psi. Both measurements made with one fire hydrant open.

**E. NARRATIVE/REMARKS/COMMENTS**

See attached narrative and the following attachments

Attachment A – Field exam maps

Attachment B - Water System Plans and Related Information

- Attachment B1 – Pump performance curves
- Attachment B2 – Pump system plans
- Attachment B3 – Water distribution system plans
- Attachment B4 – Well driller reports
- Attachment B5 – Well test data

Attachment C – Field exam photos

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements?    ☒ Yes    ☐ No    If no, what must be done to meet the permit requirements?

**F. FLOW CALCULATIONS**☒ Additional computation sheets attached

Measured Method:

Flow meter (Pumps 1 and 2 only) - 850 gpm, 1.89 cfs

See narrative for calculation of total system capacity (&gt;2000 gp, &gt;4.46 cfs) using pump curves and test pumping data

**G. VOLUME CALCULATIONS**

## 1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 9.2 \text{ acres} \times 3.0 \text{ af/ac} = 27.6 \text{ af}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 0.18 \text{ cfs} \times 200 \times 1.9835 = 71.4 \text{ af}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 27.6 \text{ af}$$

## 2. Volume Calculations for Other Uses:

$$132 \text{ domestic connections} \times 0.6 \text{ afa/connection} = 79.2 \text{ afa}$$

**H. RECOMMENDATIONS**

## 1. Recommended Amounts

| Beneficial Use  | Period of Use |       | Rate of Diversion<br>Q (cfs) | Annual Volume<br>V (afa) |
|-----------------|---------------|-------|------------------------------|--------------------------|
|                 | From          | To    |                              |                          |
| Fire Protection | 01/01         | 12/31 | 3.34 cfs                     |                          |
| Domestic        | 01/01         | 12/31 | 0.50 cfs                     | 79.2 afa                 |
| Irrigation      | 04/15         | 10/31 | 0.18 cfs                     | 27.6 afa                 |
|                 |               |       |                              |                          |
|                 |               |       |                              |                          |
| <b>Totals:</b>  |               |       | 4.02 cfs                     | 106.8 afa                |

## 2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☒ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**

Field Examiner's Signature



Date

7/30/2017

Reviewer

Date



STATE OF IDAHO  
DEPARTMENT OF WATER RESOURCES

Ident. No. 65-22945

**Point of Diversion/Place of Use Supplement**

Attachment to: ☐ Application for Permit to Appropriate Water ☐ Application for Transfer\*\* ☐ Adjudication Claim  
☐ Application for Amendment of Permit ☒ Beneficial Use Field Report ☐ Statutory Claim

**Location of points of diversion (POD):**

| New<br>POD?                  | Twp | Rge | Sec | Govt<br>Lot | ¼ | ¼ | ¼ | County | Source | Local name or<br>well/diversion tag # |
|------------------------------|-----|-----|-----|-------------|---|---|---|--------|--------|---------------------------------------|
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |
| <input type="checkbox"/> Yes |     |     |     |             |   |   |   |        |        |                                       |

**Description of place of use (POU):**

- a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.  
b. If water is used for other purposes, place a symbol of the use (example: D for Domestic) in the corresponding place of use below.

| TWP | RGE | SEC | NE  |    |    |    | NW |    |    |    | SW  |     |    |     | SE |     |     |     | TOTALS |
|-----|-----|-----|-----|----|----|----|----|----|----|----|-----|-----|----|-----|----|-----|-----|-----|--------|
|     |     |     | NE  | NW | SW | SE | NE | NW | SW | SE | NE  | NW  | SW | SE  | NE | NW  | SW  | SE  |        |
| 18N | 2E  | 25  |     |    |    |    |    |    |    |    |     |     |    | 1.0 |    | 2.6 | 0.6 | 2.9 | 7.1    |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     | L1  |     |        |
|     |     | 36  | 0.6 |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     | 0.6    |
|     |     |     | L2  |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
| 18N | 3E  | 30  |     |    |    |    |    |    |    |    | 0.2 | 1.3 |    |     |    |     |     |     | 1.5    |
|     |     |     |     |    |    |    |    |    |    |    | L11 | L11 |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |
|     |     |     |     |    |    |    |    |    |    |    |     |     |    |     |    |     |     |     |        |

Total acres: 9.2

\*\*If this supplemental sheet is for an Application for Transfer, insert this page into Part 1B of the application.

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## **E. NARRATIVE/REMARKS/COMMENTS**

**Background.** This permit was originally intended to include domestic and irrigation uses for all of the Blackhawk on the River subdivision, as well as parts of two other developments. The permit lapsed in 2015, but is being reinstated now.

**Overlapping Water Rights.** There are five overlapping water rights (permit 65-23042, license 65-22960, and decrees 65-7653E, 65-7576C, and 65-7576D).

The following permit and license are diverted from the same two wells as permit 65-22945.

- Permit 65-23042 authorizes the diversion of 5 cfs and 30 afa of groundwater for irrigation, domestic, fire protection, aesthetic storage, and diversion to storage uses within the Blackhawk South development. The uses authorized by this permit has not been developed.
- License 65-22960 authorizes the diversion of 0.17 cfs and 145.7 afa of groundwater for recreation storage, aesthetic storage, aesthetic from storage, and diversion to storage, and is associated with the two reservoirs within the Blackhawk on the River subdivision.

The following two decrees appear to overlap portions of approximately 5 residential lots located in the NENE and NWNE of Section 36, but are not used within those lots.

- Decree 65-7653E decree authorizes the diversion of 2.48 cfs and 381 afa from the North Fork of the Payette River for irrigation use at the southern end of Blackhawk on the River subdivision.
- Decree 65-7576C decree authorizes the diversion of 8.99 cfs and 1346.74 afa from springs for irrigation and stockwater uses on approximately the same lands as 65-7653E.

The following decree lists points of diversion within the permit 65-22945 place of use area, but the place of use for this permit is outside of the area.

- Decree 65-7576D decree authorizes the diversion of 0.78 cfs from springs for recreation use.

**Water System Description.** The water system includes two water supply wells that supplied domestic water to 131 connections (consisting of 130 residential lots, plus the recreation center lot) within Blackhawk on the River Subdivision as of 2015, when the permit lapsed. Only about 20 of those lots contained homes as of 2015, but some additional lots appeared to have been disturbed or cleared, and all the roads were in place, indicating that the entire subdivision had been stubbed in for domestic purposes at that point. The water system operator (Warren Drake of Drake Diversified LLC) confirmed that he has found stubs for every lot where he has needed find a stub (i.e., new construction). The community manager, Eddie, also indicated that all lots are stubbed. During the field exam, most (but not all) stubs (as indicated by water meter boxes) were visible. It is assumed that some of the meter boxes were covered over with soil.

The water system is supplied from two wells. Both wells are slightly artesian.

- Well #1 is completed to a depth of 495 feet, with a 12-inch casing to 275 feet; 10-inch casing from 275 to 295 feet; 10-inch casing and screen from 295 to 345 feet; 10-inch casing from 345 to 355 feet; 10-inch casing and screen from 355 to 365 feet; 10-inch casing from 365 to 405 feet; and 10-inch casing and screen from 405 to 455 feet. Well #1 is equipped with a variable-speed 40-hp, 450 gpm submersible well pump (Berkeley 7T-450, 6-inch drop pipe) and located in a building to protect the artesian well from freezing. The well is located in Lot W1, Block 3, Phase 2, Blackhawk on the River Subdivision. During initial test pumping in 2005, the well produced 1700 gpm from a pumping water level of 74 feet.
- Well #2 is completed to a depth of 495 feet, with a 20-inch casing to 285 feet; 10-inch casing from 288 to 321 feet; 10-inch casing and screen from 321 to 351 feet; 10-inch casing from 351 to 376 feet; and 10-inch casing and screen from 376 to 456 feet. Well #2 is equipped with a variable-speed 15-hp, 225 gpm submersible well pump (Berkeley 6T 225) and a constant-speed 100-hp, 1000 gpm submersible well pump (Berkeley 8T-900, 6-inch drop pipe) and is located in the pump house. The well and pump house are located Lot W2, Block 3, Phase 2, Blackhawk on the River Subdivision. During initial test pumping in 2005, the well produced 1990 gpm from a pumping water level of 92 feet.

The 15-hp pump is normally designated as the lead pump to accommodate low demand periods. The 40-hp pump serves as the lead pump during high demand periods, and the 100-hp pump serves as a standby pump and was designed to operate only during fire flow events and occasional hydrant testing.

The water distribution system consists of a mix of 8-inch and 12-inch water mains.

**Rate and Volume Determination.** Diversions rates and volume recommendations were developed as follows:

- Diversion rate and volume for irrigation has been determined based on irrigated area (9.2 acres at 0.02 cfs/ac and 3.0 afa/ac)
- Diversion rate for fire protection is based on the permitted amount (1500 gpm, 3.34 cfs) which is the typical hydrant fire flow capacity listed by international fire code
- Diversion rate for domestic use is based on the IDWR chart (Figure 1) and 132 connections (0.50 cfs). Volume for domestic use is based on 0.6 afa per connection ( $132 \times 0.6 \text{ afa} = 79.2 \text{ afa}$ ).

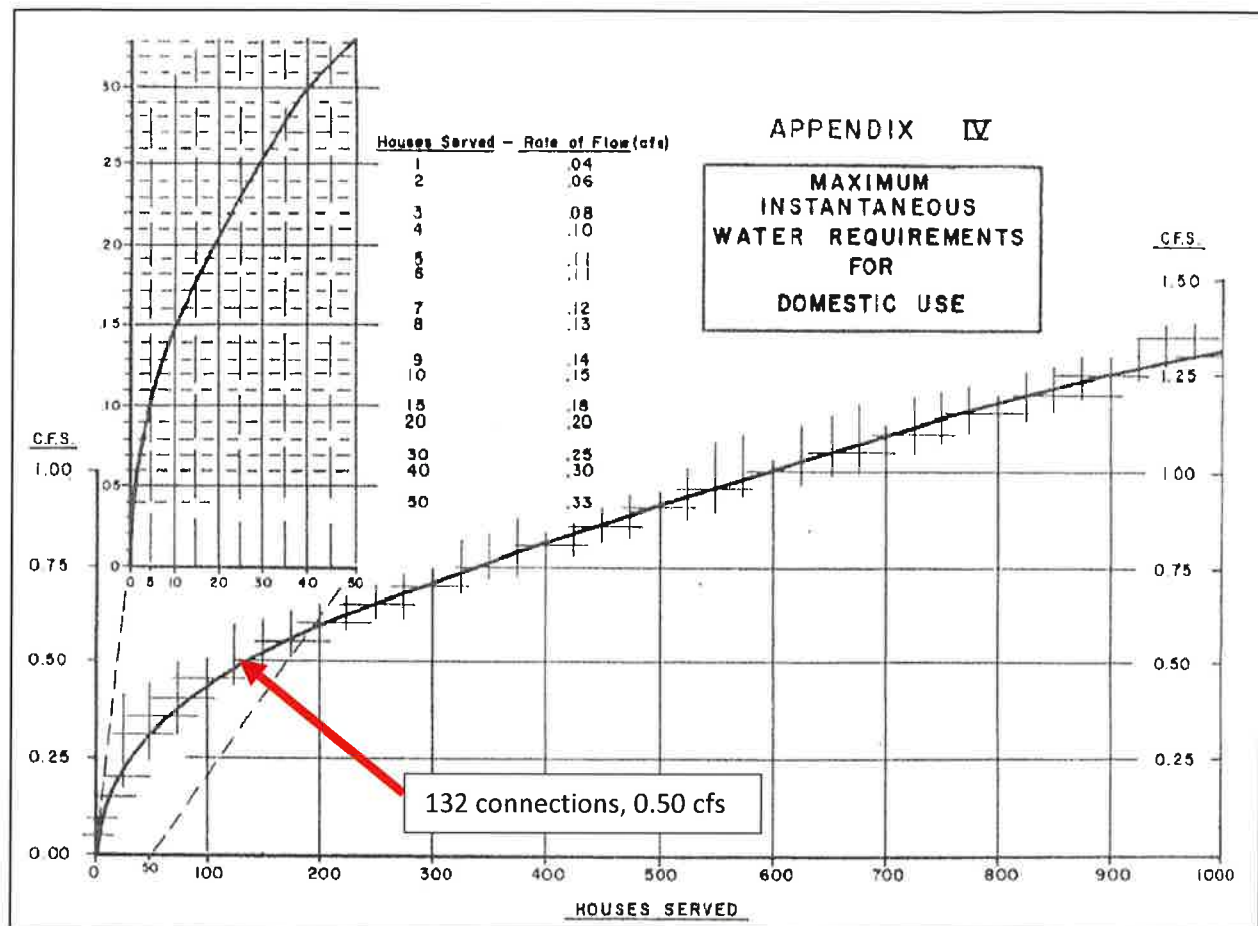


Figure 1. Domestic use chart

**Water System Capacity.** The 15-hp and 40-hp discharge through a McCrometer UltraMag flow meter. At low discharge pressure (42 psi) the two pumps in combination produced a stable measured flow of 850 gpm (1.89 cfs).

There is no flow meter on the discharge from the 100-hp pump. The water system operator noted that he needs to have two fire hydrants open to operate the 100-hp pump without cycling, and that the large fire flow rate causes localized flooding. Because there was no practical way to measure the flow rate from the 100-hp pump, a test was not conducted.

The combined capacity of the system can be calculated based on

- the 100-hp pump curve (1225 gpm from 200 feet TDH),
- the 40-hp pump curve (580 gpm from 170 feet TDH), and
- the 15-hp pump curve (250 gpm from 200 feet TDH).

The 40-hp and 15-hp pump capacities were confirmed based on the measured pumping rate from the 15-hp and 40-hp pumps (850 gpm at 42 psi). The 100-hp pump is used for fire protection only, and is in like-new condition.

The pumping test data for the two wells is included in Attachment A.

- For a pumping rate of 580 gpm (40 hp pump at 170 feet TDH), we expect a pumping water level of approximately 35 feet in Well 1 (static water level +10 feet, 30 feet drawdown, 15 feet interference from Well 2). Allowing for 10 feet of column loss and 10 feet of mechanical piping loss, the 40-hp pump in Well 1 should produce 580 gpm at a discharge pressure of approximately 50 psi.
- For a pumping rate of 1475 gpm (15 hp and 100 hp pumps at 200 feet TDH), we expect a pumping water level of approximately 58 feet in Well 2 (static water level +20 feet, 73 feet drawdown, 5 feet interference from Well 1). Allowing for 10 feet of column loss and 10 feet of mechanical piping loss, the two pumps in Well 2 should produce 1475 gpm at a discharge pressure of approximately 53 psi.

In combination, the two wells should produce 2,055 gpm (4.58 cfs) at approximately 50 psi. Therefore, the system can simultaneously produce in excess of the total 1882 gpm (4.19 cfs) demand consisting of 1500 gpm (3.34 cfs) fire flow, 225 gpm (0.50 cfs) domestic demand, 81 gpm (0.18 cfs) irrigation demand, and 76 gpm (0.17 cfs) demand for license 65-22960.

Attachment A  
Field Exam Maps

## Domestic Connections as of 2015

- Irrigation**  
**Common Areas**  
**Residential**



**SPF WATER  
ENGINEERING**

300 East Mallard Drive, Suite 350  
Boise, Idaho 83706  
Tel (208) 383-4140 Fax (208) 383-4156

PERMIT 65-22945  
BENEFICIAL USE FIELD EXAM

DOMESTIC &amp; IRRIGATION PODS &amp; POUSS

DATE: 7/19/2019

CREATOR: mpape

PROJECT: 1485.0010

Absolute Scale: 1:8,000



COORDINATE REFERENCE SYSTEM: NAD 1983 2011 StatePlane Idaho West FIPS 1103 FIPS

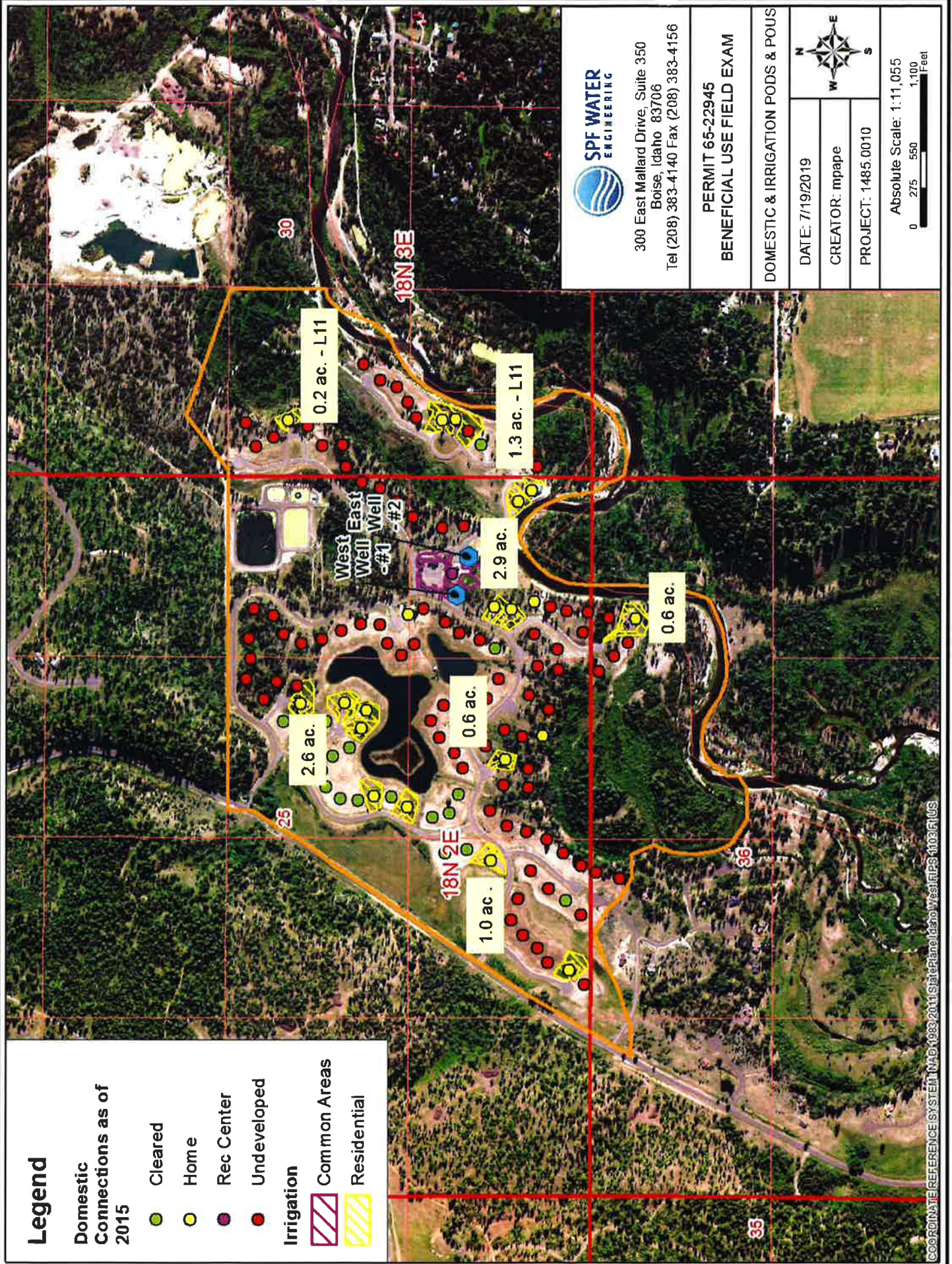
# Legend

Domestic  
Connections as of  
2015

- Cleared
- Home
- Rec Center
- Undeveloped

## Irrigation

- Common Areas
- Residential



300 East Mallard Drive, Suite 350  
Boise, Idaho 83706  
Tel (208) 383-4140 Fax (208) 383-4156

PERMIT 65-22945  
BENEFICIAL USE FIELD EXAM

DOMESTIC & IRRIGATION PODS & POU

DATE: 7/19/2019

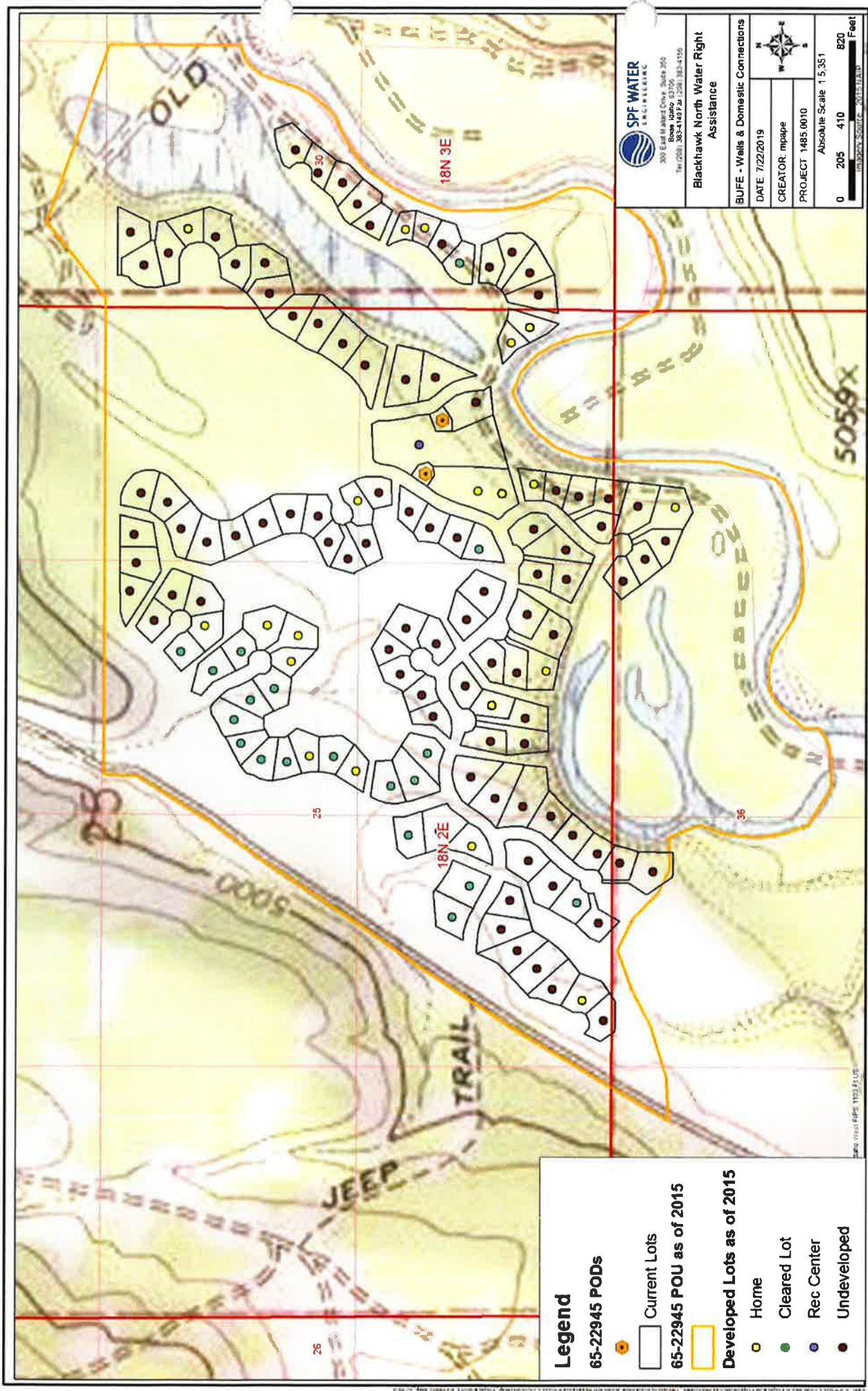
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PROJECT: 1485.0010



Absolute Scale: 1:11,055  
0 275 550 1,100 Feet

Path: S:\PROJECTS\TSM\Irru R Projects\McCall Associates\148500 TO Blackhawk North\WRAssistance\PROJECT\GIS\WRA\Map\Project\BURE POU Map.mxd



**Attachment B**

**Water System Plans And Related Information**

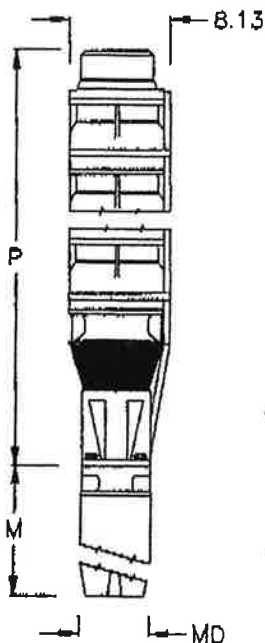
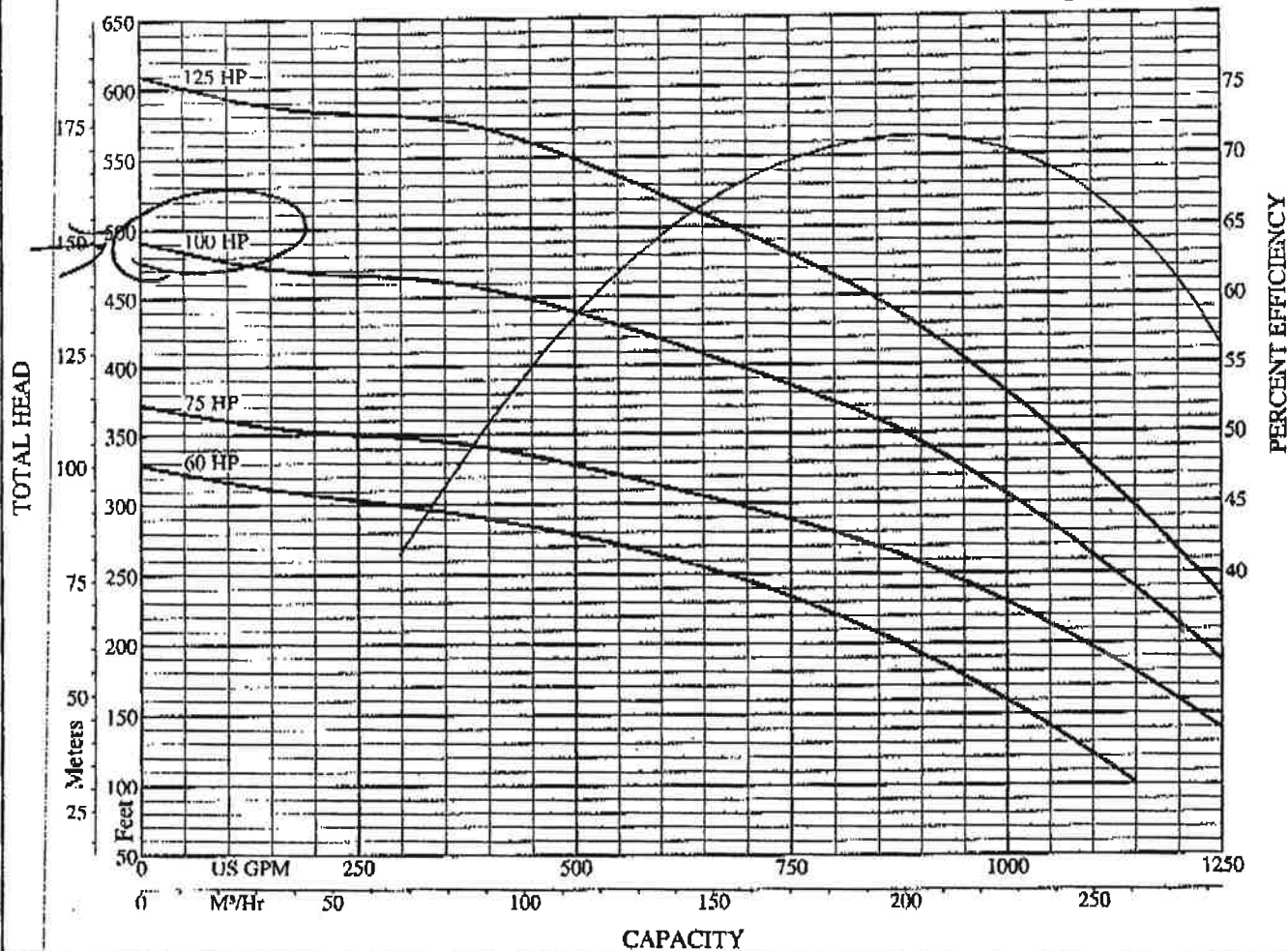
## **Attachment B1 – Pump Performance Curves**



# SUBMERSIBLE TURBINE

## 8T-900

Nominal RPM: 3450  
Based on Fresh Water @ 68° F.  
Maximum Working Pressure: 510 PSI



### OUTLINE DIMENSIONS / WEIGHTS

| HP  | stages | Motor size | P length | M* length | MD* dia. | Mtr. wt. | Pump wt. |
|-----|--------|------------|----------|-----------|----------|----------|----------|
| 60  | 3      | 6"         | 43.00    | 61.30     | 5.44     | 335      | 145      |
| 75  | 3      | 8"         | 43.75    | 54.90     | 7.50     | 433      | 148      |
| 100 | 4      | 8"         | 50.50    | 58.90     | 7.50     | 478      | 177      |
| 125 | 5      | 8"         | 57.25    | 68.80     | 7.70     | 709      | 206      |

Note: dimensions = inches; weight = U.S. lbs.

M\* Maximum length (Franklin Electric Motor)

MD\* Motor diameter (Franklin Electric Motor)

### SPECIFICATIONS

|                                                        |                |
|--------------------------------------------------------|----------------|
| Minimum Well I.D.                                      | 10.0 Inches    |
| Minimum Submergence @ BEP (above inlet)                | 15.0 Feet      |
| Capacity Range                                         | 227 - 1300 GPM |
| Discharge                                              | 6" F NPT       |
| See manufacturer's data for motor cooling requirements |                |

### SUPERSEDES

All Previous

Date 04/15/98

Section **ST**

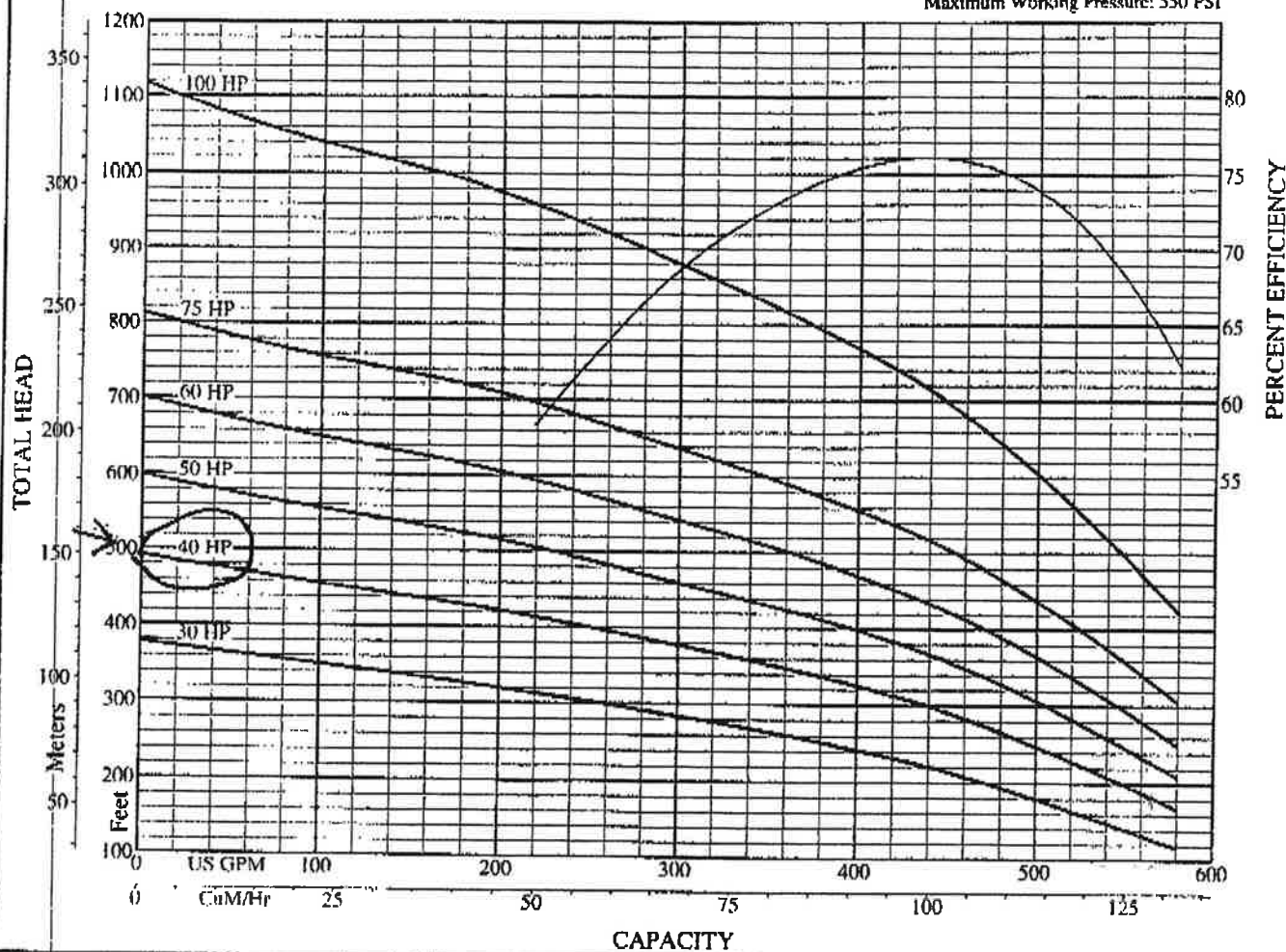
Page 27.05

**BERKELEY****SUBMERSIBLE  
TURBINE****7T-450**

Nominal RPM: 3450

Based on Fresh Water @ 68° F.

Maximum Working Pressure: 550 PSI

**OUTLINE DIMENSIONS / WEIGHTS**

| HP  | stages | Motor size | P length | M* length | MD* dia. | Mtr. wt. | Pump wt. |
|-----|--------|------------|----------|-----------|----------|----------|----------|
| 30  | 4      | 6"         | 39.44    | 35.69     | 5.38     | 162      | 136      |
| 40  | 5      | 6"         | 45.94    | 40.81     | 5.38     | 195      | 161      |
| 50  | 6      | 6"         | 52.44    | 57.83     | 5.38     | 310      | 187      |
| 60  | 7      | 6"         | 58.94    | 63.83     | 5.38     | 340      | 212      |
| 75  | 8      | 8"         | 66.94    | 46.79     | 7.58     | 450      | 290      |
| 100 | 11     | 8"         | 86.44    | 54.29     | 7.58     | 520      | 366      |

Note: dimensions = inches; weight = U.S. lbs.

M\* Maximum length (Franklin Electric Motor)

MD\* Motor diameter (Franklin Electric Motor)

**SPECIFICATIONS**

|                                                        |                 |
|--------------------------------------------------------|-----------------|
| Minimum Well I.D.                                      | 8.0 Inches      |
| Minimum Submergence @ BEP (above inlet)                | 10.0 Feet       |
| Capacity Range                                         | 100 - 580 GPM   |
| Discharge                                              | 5" F x 6" M NPT |
| See manufacturer's data for motor cooling requirements |                 |

**SUPERSEDES**

All Previous

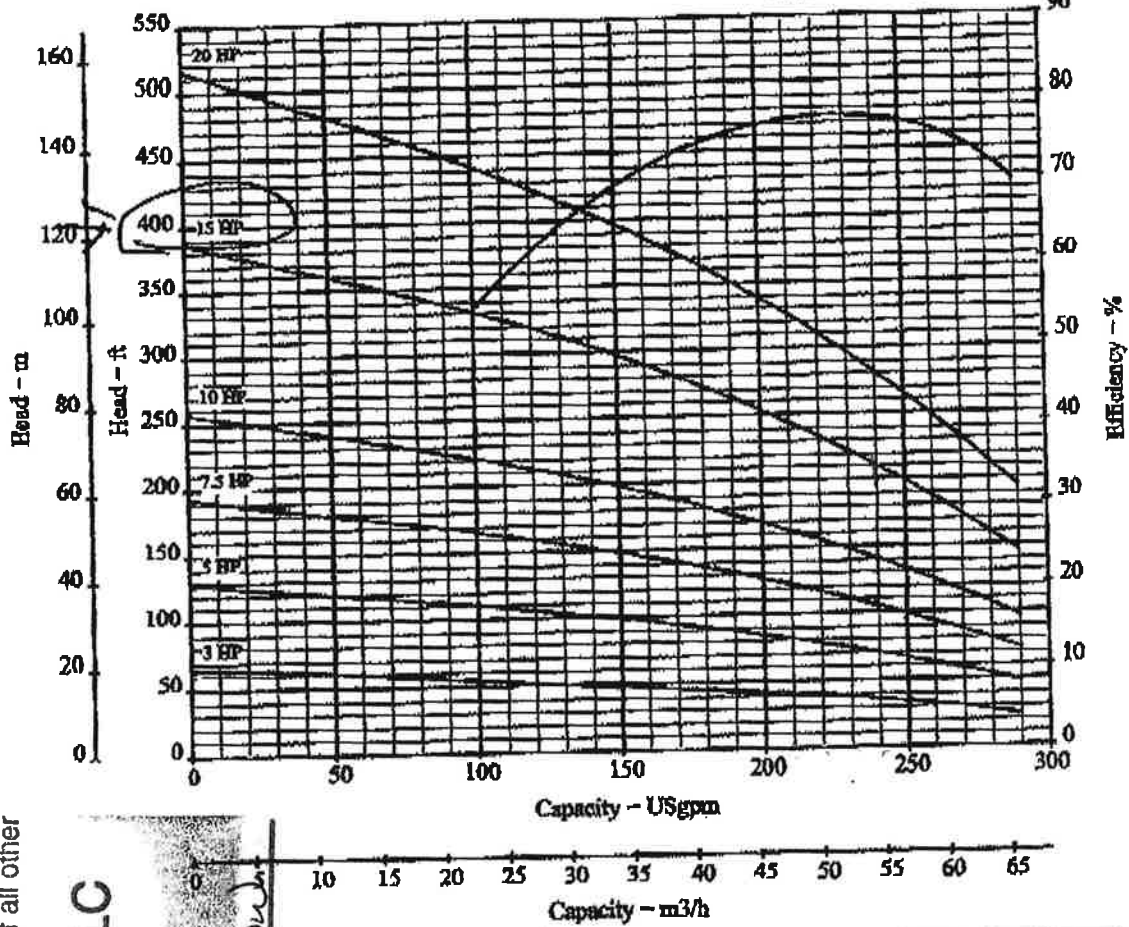
Date **04/15/96**Section **ST**Page **20.03**



# SUBMERSIBLE TURBINE

6T-225

Nominal RPM: 3450  
Based on Fresh Water @ 68 F.  
Maximum Working Pressure: 580 PSI



SPF WATER ENGINEERING, LLC



DATE 2/1/2006 BY Jenny Suber

## OUTLINE DIMENSIONS / WEIGHTS

| HP  | stages | Motor size | P length | M* length | MD* dia. | Mtr. wt. | Pump wt. |
|-----|--------|------------|----------|-----------|----------|----------|----------|
| 3   | 1      | 4"         | 15.61    | 23.62     | 3.75     | 53       | 54       |
| 5   | 2      | 6"         | 23.98    | 27.00     | 5.51     | 95       | 75       |
| 7.5 | 3      | 6"         | 28.98    | 27.60     | 5.51     | 114      | 94       |
| 10  | 4      | 6"         | 33.98    | 29.80     | 5.51     | 127      | 114      |
| 15  | 6      | 6"         | 43.98    | 30.40     | 5.51     | 130      | 152      |
| 20  | 8      | 6"         | 53.98    | 33.50     | 5.51     | 160      | 191      |

M\* Maximum length (Footed Motor)  
MD\* Motor diameter (Footed Motor)

## SPECIFICATIONS

|                                                        |             |
|--------------------------------------------------------|-------------|
| Minimum Well LD.                                       | 6.0 Inches  |
| Minimum Submergence @ BEP (above inlet)                | 10.0 Feet   |
| Capacity Range                                         | 100-300 GPM |
| Discharge                                              | 4" F NPT    |
| See manufacturer's data for motor cooling requirements |             |

## SUPERSEDES

All Previous

Date 04/01/05

Section 6T

Page 6.01

MAKE CORRECTIONS NOTED ☐ REJECTED RESUBMIT  
Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor is responsible for dimensions which shall be confirmed and corrected at the job site, fabrication processes and techniques of construction, coordination of his work with that of all other trades and the satisfactory performance of his work.



Franklin Electric

# Application - Three Phase Motors

Table 22 Three Phase Motor Specifications (60 Hz)

| Type   | Motor Model Prefix | Rating |      |       |                |      | Full Load Amps | Maximum (S.F. Load) Amps | Line to Line Resistance Ohms | Efficiency % |      |     | Locked Rotor Amps | KVA Code | Circuit Breakers or Fuse Amps |                              |                     |
|--------|--------------------|--------|------|-------|----------------|------|----------------|--------------------------|------------------------------|--------------|------|-----|-------------------|----------|-------------------------------|------------------------------|---------------------|
|        |                    | HP     | KW   | Volts | H <sub>z</sub> | S.F. |                |                          |                              | S.F.         | F.L. | 3/4 |                   |          | Noontime Delay (Std.) Fuse    | Dual Element Time Delay Fuse | Inrush Time Breaker |
| 6 Inch | 236650             | 5      | 3.7  | 200   | 60             | 1.15 | 17.5           | 19.1                     | .68-.84                      | 79           | 79   | 77  | 99                | H        | 60                            | 35                           | 45                  |
|        | 236660             | 5      | 3.7  | 380   | 60             | 1.15 | 9.1            | 10                       | 2.4-3.0                      | 79           | 79   | 77  | 52                | H        | 30                            | 20                           | 25                  |
|        | 236620             | 5      | 3.7  | 575   | 60             | 1.15 | 6              | 6.6                      | 5.9-7.2                      | 79           | 79   | 77  | 34                | H        | 20                            | 15                           | 15                  |
|        | 236601             | 7 1/2  | 5.5  | 230   | 60             | 1.15 | 21.8           | 24.6                     | .57-.71                      | 80           | 80   | 78  | 130               | H        | 70                            | 40                           | 60                  |
|        | 236611             | 7 1/2  | 5.5  | 460   | 60             | 1.15 | 10.9           | 12.3                     | 2.2-2.7                      | 80           | 80   | 78  | 65                | H        | 35                            | 20                           | 30                  |
|        | 236652             | 10     | 7.5  | 200   | 60             | 1.15 | 32.7           | 37                       | .33-.42                      | 79           | 79   | 78  | 198               | H        | 100                           | 60                           | 90                  |
|        | 236662             | 10     | 7.5  | 380   | 60             | 1.15 | 17.2           | 19.5                     | 1.2-1.5                      | 79           | 79   | 78  | 104               | H        | 60                            | 35                           | 45                  |
|        | 236622             | 10     | 7.5  | 575   | 60             | 1.15 | 11.4           | 12.9                     | 2.8-3.5                      | 79           | 79   | 78  | 69                | H        | 35                            | 25                           | 30                  |
|        | 236603             | 15     | 11   | 230   | 60             | 1.15 | 41.6           | 47.4                     | .27-.33                      | 81           | 81   | 80  | 266               | H        | 150                           | 80                           | 110                 |
|        | 236613             | 15     | 11   | 460   | 60             | 1.15 | 20.8           | 23.7                     | 1.1-1.3                      | 81           | 81   | 80  | 133               | H        | 70                            | 40                           | 60                  |
|        | 236654             | 20     | 15   | 200   | 60             | 1.15 | 61.9           | 69.7                     | .14-.17                      | 82           | 82   | 81  | 416               | J        | 200                           | 110                          | 175                 |
|        | 236664             | 20     | 15   | 380   | 60             | 1.15 | 32.6           | 36.7                     | .52-.64                      | 82           | 82   | 81  | 219               | J        | 100                           | 60                           | 90                  |
|        | 236624             | 20     | 15   | 575   | 60             | 1.15 | 21.5           | 24.4                     | 1.2-1.5                      | 82           | 82   | 81  | 145               | J        | 70                            | 40                           | 60                  |
|        | 236605             | 25     | 18.5 | 230   | 60             | 1.15 | 67             | 75                       | .15-.19                      | 83           | 83   | 82  | 480               | J        | 225                           | 125                          | 175                 |
|        | 236615             | 25     | 18.5 | 460   | 60             | 1.15 | 33.5           | 37.5                     | .59-.73                      | 83           | 83   | 82  | 240               | J        | 110                           | 60                           | 90                  |
|        | 236656             | 30     | 22   | 200   | 60             | 1.15 | 90.9           | 104                      | .10-.12                      | 83           | 83   | 86  | 653               | J        | 300                           | 175                          | 250                 |
|        | 236666             | 30     | 22   | 380   | 60             | 1.15 | 47.8           | 54.7                     | .33-.41                      | 83           | 83   | 86  | 317               | J        | 150                           | 90                           | 125                 |
|        | 236626             | 30     | 22   | 575   | 60             | 1.15 | 31.6           | 36.2                     | .78-.95                      | 83           | 83   | 86  | 227               | J        | 100                           | 60                           | 90                  |
|        | 236617             | 40     | 30   | 460   | 60             | 1.15 | 53.5           | 62                       | .32-.40                      | 83           | 83   | 83  | 397               | J        | 175                           | 100                          | 150                 |
|        | 236668             | 50     | 37   | 380   | 60             | 1.15 | 82             | 93.2                     | .17-.22                      | 82           | 83   | 83  | 501               | H        | 250                           | 150                          | 225                 |
|        | 236628             | 50     | 37   | 575   | 60             | 1.15 | 54.2           | 61.6                     | .39-.48                      | 82           | 83   | 83  | 331               | H        | 175                           | 100                          | 150                 |
|        | 236619             | 60     | 45   | 460   | 60             | 1.15 | 80.5           | 91                       | .22-.27                      | 84           | 84   | 84  | 518               | H        | 250                           | 150                          | 225                 |
|        | 236629             | 60     | 45   | 575   | 60             | 1.15 | 57.5           | 66                       | .35-.44                      | 84           | 84   | 84  | 414               | H        | 200                           | 125                          | 175                 |

Model numbers are three lead motors. Six lead motors with different model numbers have the same running performance, but when wye connected for starting have locked rotor amps 33% of the values shown.



# Fran Electric

## Application - Three Phase Motors

Table 23 Three Phase Motor Specifications (60 Hz)

| Type   | Motor Model Prefix | Rating |     |       |    |      | Full Load Amps | Maximum (S.F. Load) Amps | Line to Line Resistance Ohms | Efficiency % |      |     | Locked Rotor Amps | KVA Code | Circuit Breakers or Fuse Amps |                              |                      |
|--------|--------------------|--------|-----|-------|----|------|----------------|--------------------------|------------------------------|--------------|------|-----|-------------------|----------|-------------------------------|------------------------------|----------------------|
|        |                    | HP     | KW  | Volts | Hz | S.F. |                |                          |                              | S.F.         | F.L. | 3/4 |                   |          | Nontime Delay (Std.) Fuse     | Dual Element Time Delay Fuse | Inverse Time Breaker |
| 8 Inch | 239660             | 40     | 30  | 380   | 60 | 1.15 | 64             | 72                       | .162-.198                    | 86           | 86   | 85  | 479               | J        | 200                           | 125                          | 175                  |
|        | 239600             | 40     | 30  | 460   | 60 | 1.15 | 53             | 60                       | .203                         | 86           | 86   | 85  | 317               | J        | 150                           | 80                           | 110                  |
|        | 239610             | 40     | 30  | 575   | 60 | 1.15 | 42             | 48                       | .399-.487                    | 86           | 86   | 85  | 317               | J        | 150                           | 80                           | 110                  |
|        | 239661             | 50     | 37  | 380   | 60 | 1.15 | 77             | 84                       | .181-.221                    | 87           | 87   | 86  | 542               | K        | 200                           | 125                          | 175                  |
|        | 239601             | 50     | 37  | 460   | 60 | 1.15 | 64             | 73                       | .227-.277                    | 87           | 87   | 86  | 542               | K        | 200                           | 125                          | 175                  |
|        | 239611             | 50     | 37  | 575   | 60 | 1.15 | 53             | 60                       | .487                         | 87           | 87   | 86  | 317               | J        | 150                           | 80                           | 110                  |
|        | 239662             | 60     | 45  | 380   | 60 | 1.15 | 92             | 104                      | .090-.110                    | 88           | 87   | 86  | 797               | K        | 300                           | 175                          | 250                  |
|        | 239602             | 60     | 45  | 460   | 60 | 1.15 | 75             | 84                       | .130                         | 88           | 87   | 86  | 526               | K        | 200                           | 110                          | 175                  |
|        | 239612             | 60     | 45  | 575   | 60 | 1.15 | 81             | 69                       | .227-.277                    | 88           | 87   | 86  | 526               | K        | 200                           | 110                          | 175                  |
|        | 239663             | 75     | 55  | 380   | 60 | 1.15 | 107            | 122                      | .106-.130                    | 88           | 88   | 87  | 864               | L        | 300                           | 175                          | 250                  |
|        | 239603             | 75     | 55  | 460   | 60 | 1.15 | 94             | 107                      | .130                         | 88           | 88   | 87  | 864               | L        | 300                           | 175                          | 250                  |
|        | 239613             | 75     | 55  | 575   | 60 | 1.15 | 76             | 84                       | .203                         | 88           | 88   | 87  | 526               | K        | 200                           | 110                          | 175                  |
|        | 239664             | 100    | 75  | 380   | 60 | 1.15 | 153            | 172                      | .051-.062                    | 89           | 89   | 88  | 1466              | L        | 500                           | 300                          | 400                  |
|        | 239604             | 100    | 75  | 460   | 60 | 1.15 | 122            | 140                      | .062                         | 89           | 89   | 88  | 969               | L        | 350                           | 200                          | 300                  |
|        | 239614             | 100    | 75  | 575   | 60 | 1.15 | 101            | 114                      | .110-.134                    | 89           | 89   | 88  | 969               | L        | 350                           | 200                          | 300                  |
|        | 239665             | 125    | 90  | 380   | 60 | 1.15 | 167            | 188                      | .055-.067                    | 87           | 86   | 85  | 1318              | K        | 500                           | 300                          | 450                  |
|        | 239105             | 125    | 90  | 460   | 60 | 1.15 | 167            | 188                      | .067                         | 87           | 86   | 85  | 1318              | K        | 500                           | 300                          | 450                  |
|        | 239106             | 125    | 90  | 575   | 60 | 1.15 | 135            | 154                      | .082                         | 87           | 86   | 85  | 969               | L        | 350                           | 200                          | 300                  |
|        | 239166             | 150    | 110 | 380   | 60 | 1.15 | 235            | 266                      | .028-.034                    | 88           | 87   | 86  | 1961              | K        | 800                           | 450                          | 600                  |
|        | 239107             | 150    | 110 | 460   | 60 | 1.15 | 197            | 226                      | .034                         | 88           | 87   | 86  | 1500              | J        | 600                           | 350                          | 500                  |
|        | 239167             | 150    | 110 | 575   | 60 | 1.15 | 155            | 176                      | .067-.082                    | 88           | 87   | 86  | 1296              | K        | 500                           | 300                          | 400                  |
|        | 239168             | 175    | 130 | 380   | 60 | 1.15 | 219            | 249                      | .042-.052                    | 88           | 88   | 87  | 1645              | J        | 700                           | 400                          | 600                  |
|        | 239108             | 175    | 130 | 460   | 60 | 1.15 | 219            | 249                      | .052                         | 88           | 88   | 87  | 1645              | J        | 700                           | 400                          | 600                  |
|        | 239169             | 200    | 150 | 380   | 60 | 1.15 | 298            | 342                      | .024-.029                    | 88           | 88   | 87  | 2270              | J        | 1000                          | 600                          | 800                  |
|        | 239170             | 200    | 150 | 460   | 60 | 1.15 | 249            | 284                      | .029                         | 88           | 88   | 87  | 2270              | J        | 1000                          | 600                          | 800                  |
|        | 239171             | 200    | 150 | 575   | 60 | 1.15 | 197            | 226                      | .057-.070                    | 88           | 88   | 87  | 1500              | J        | 600                           | 350                          | 500                  |

Model numbers are three lead motors. Six lead motors with different model numbers have the same running performance, but when wye connected for starting have locked rotor amps 33% of the values shown.

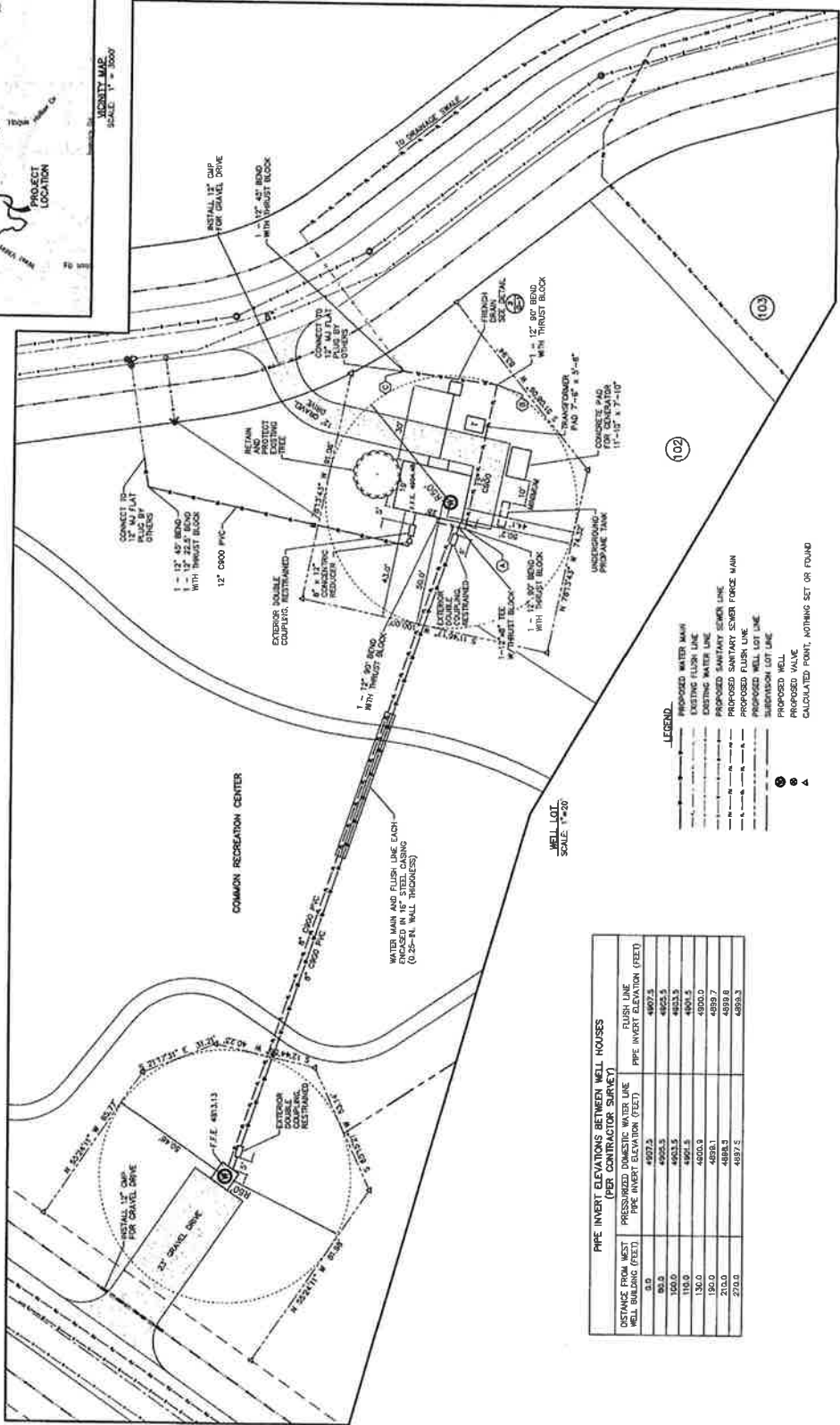
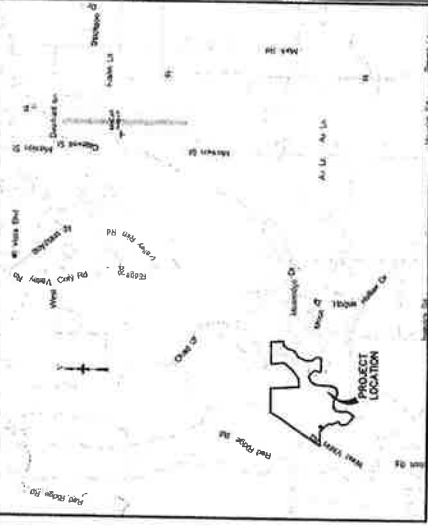
## Attachment B2 – Pump System Plans

# SHEET INDEX

- S-1) SITE PLAN AND VICINITY MAP
- M-1) EAST DOMESTIC WATER WELL AND MECHANICAL DETAILS
- M-2) WEST DOMESTIC WATER WELL AND MECHANICAL DETAILS
- A-1) EAST WELL HOUSE BUILDING PLAN AND DETAILS
- A-2) WEST WELL HOUSE BUILDING PLAN AND DETAILS
- G-1) MISCELLANEOUS DETAILS
- E-1) ELECTRICAL SPECIFICATIONS AND LEGENDS
- E-2) ELECTRICAL PLANS
- E-3) ELECTRICAL SCHEDULES AND DETAILS

NOTES:  
 MATERIALS AND EQUIPMENT MUST BE APPROVED BY THE  
 NATIONAL SANITATION FOUNDATION (NSF).  
 WELL SITES SHALL BE GRADED TO DIVERT SURFACE WATER  
 RUNOFF A MINIMUM OF 50 FEET AWAY FROM WELLS.

| NORTHING      | EASTING   | COMMENTS             |
|---------------|-----------|----------------------|
| (A) 16590.10  | 396706.73 | I.E. 4899.28 90° ELL |
| (B) 165894.65 | 396765.55 | I.E. 4899.00 90° ELL |
| (C) 165931.94 | 396770.22 | I.E. 4898.81 45° ELL |



| PIPE INVERT ELEVATIONS BETWEEN WELL HOUSES<br>(PER CONTRACTOR SURVEY) |                                                              |                                            |  |
|-----------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------|--|
| DISTANCE FROM WEST<br>WELL BUILDING (FEET)                            | PROPOSED DOMESTIC WATER LINE<br>PIPE INVERT ELEVATION (FEET) | FLUSH LINE<br>PIPE INVERT ELEVATION (FEET) |  |
| 0.0                                                                   | 4907.5                                                       | 4907.5                                     |  |
| 80.0                                                                  | 4905.5                                                       | 4905.5                                     |  |
| 100.0                                                                 | 4903.5                                                       | 4903.5                                     |  |
| 120.0                                                                 | 4901.5                                                       | 4901.5                                     |  |
| 140.0                                                                 | 4899.5                                                       | 4899.5                                     |  |
| 160.0                                                                 | 4897.5                                                       | 4897.5                                     |  |
| 180.0                                                                 | 4895.5                                                       | 4895.5                                     |  |
| 200.0                                                                 | 4893.5                                                       | 4893.5                                     |  |
| 220.0                                                                 | 4891.5                                                       | 4891.5                                     |  |

- LEGEND
- PROPOSED WATER MAIN
  - EXISTING FLUSH LINE
  - EXISTING WATER LINE
  - PROPOSED SANITARY SEWER LINE
  - PROPOSED SANITARY SEWER FORCE MAIN
  - PROPOSED FLUSH LINE
  - PROPOSED WATER LINE
  - PROPOSED LOT LINE
  - PROPOSED WELL
  - PROPOSED VALVE
  - CALCULATED POINT, NOTHING SET OR FOUND

**SPF Water Engineering, LLC**  
 WATER RESOURCE CONSULTANTS  
 600 East Main Street, Suite 105, Boise, Idaho 83702  
 Tel: (208) 363-1160 Fax: (208) 363-1158

**BLACKHAWK ON THE RIVER SUBDIVISION**  
 WELL AND PUMP PLANS  
 A PORTION OF THE SOUTHWEST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 25  
 TOWNSHIP 18 NORTH, RANGE 2 EAST, MOORE MERIDIAN  
 VALLEY COUNTY, IDAHO  
 PROJECT NUMBER: 2020-01  
 DATE: 1/2/2020



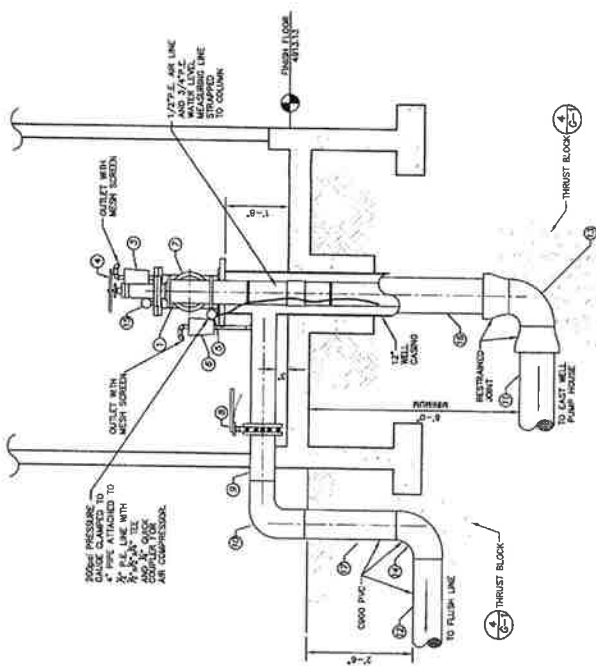
DRAWN BY: S. HIGGINS  
 CHECKED BY: J. GARY  
 SCALE: AS SHOWN  
 PLOT SCALE: 1" = 1'

| ITEM | REVISIONS             |
|------|-----------------------|
| 1    | ISSUED FOR PERMITTING |
| 2    | REVISED FOR COMMENTS  |
| 3    | REVISED FOR COMMENTS  |
| 4    | REVISED FOR COMMENTS  |
| 5    | REVISED FOR COMMENTS  |
| 6    | REVISED FOR COMMENTS  |
| 7    | REVISED FOR COMMENTS  |
| 8    | REVISED FOR COMMENTS  |
| 9    | REVISED FOR COMMENTS  |
| 10   | REVISED FOR COMMENTS  |

AS BUILT  
 10-18-08

NOTES:

1. THE CONTRACTOR SHALL FURNISH AND INSTALL EVERYTHING REQUIRED TO PROVIDE A COMPLETE BURNING FACILITY AS SHOWN HEREON. IF THERE IS AN OMISSION ON THE PLANS, SUCH OMISSION SHALL NOT BE CONSTRUED TO MEAN THAT THE CONTRACTOR IS NOT REQUIRED TO FURNISH OR PROVIDE EVERYTHING THAT IS NECESSARY TO PROVIDE A COMPLETE AND OPERATING PUMPING FACILITY.
2. ALL MATERIALS AND EQUIPMENT MUST BE APPROVED BY THE NATIONAL SANITATION FOUNDATION (NSF).





**GEN SHEET NOTES:**

1. SEE CIVIL DRAWINGS FOR EXACT DISTANCES.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE 2014 NATIONAL ELECTRICAL CODE (NEC) AND THE 2014 IDAHO ELECTRICAL CODE (IEC).
3. ALL INTERIOR RECEPTACLES 48" AFF. UNLESS NOTED.

**SHEET NOTES:**

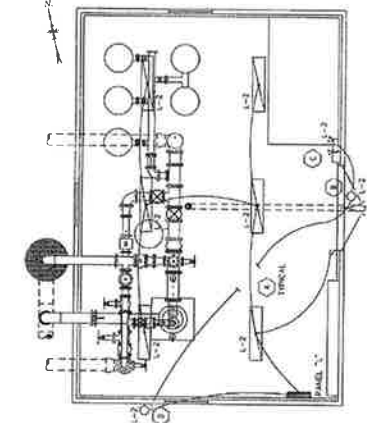
1. SEE SINGLE LINE FOR CONDUIT AND CONDITIONS FOR EQUIPMENT AND 48" AFF. FOR RECEPTACLE CIRCUIT.
2. SEE CONTROLS DIAGRAM FOR CONDUIT AND CONDUCTOR SIZES.
3. PULL MOUNTED CHARACTER FAN.
4. P.C. SHALL BE NOTED IN SECTION 25 MINIMUM HOPIUM OR EQUAL CEMENT.
5. PROVIDE RECEPTACLE WITH 1/2" O.D. AND 1/2" TIGHT METAL PLASTIC CONDUIT FROM RECEPTACLE TO PANEL.
6. SEE FLOOR PLANS FOR LOCATION OF DEVICES INSIDE BUILDING.
7. TRANSFORMER, CONDUIT AND CONDUCTORS BY P.C.
8. SEE SINGLE LINE FOR GENERATOR CONDUIT AND CONDUCTORS.

**PUMP HOUSE SOP:**

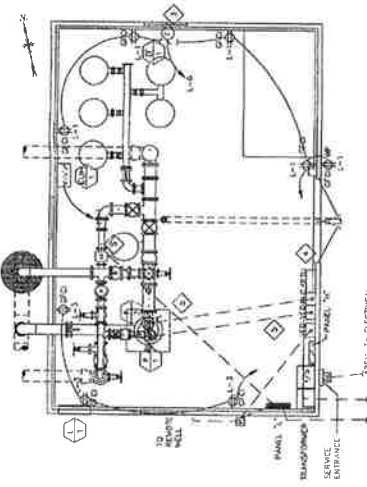
- NORMAL OPERATION USE:**
1. THE SELECTED LEAD PUMP (PT OF P2) WILL RUN WHEN A SIGNAL FROM THE P.C. TO MAINTAIN SET POINT PRESSURE OF 55 PSI (ADJUSTABLE).
  2. IF THE LEAD PUMP RUNS AT SIZE (FOR MORE THAN 15 MIN (ADJUSTABLE) OR AT 100% CAPACITY, THE P.C. WILL AUTOMATICALLY START THE SECOND LEAD PUMP FROM THE P.C. TO MAINTAIN SET PRESSURE OF 55 PSI (ADJUSTABLE).
  3. IF THE LEAD PUMP RUNS AT 100% SPEED FOR MORE THAN 30 MIN OR AT 100% CAPACITY, THE P.C. WILL AUTOMATICALLY START THE SECOND LEAD PUMP FROM THE P.C. TO MAINTAIN SET PRESSURE OF 55 PSI (ADJUSTABLE).
  4. IF THE LEAD PUMP RUNS AT 100% SPEED FOR 30 SECONDS (ADJUSTABLE) AND THE P.C. WILL AUTOMATICALLY START THE SECOND LEAD PUMP FROM THE P.C. TO MAINTAIN SET PRESSURE OF 55 PSI (ADJUSTABLE).
  5. START LEAD PUMP WHEN SYSTEM PRESSURE IS 55 PSI (ADJUSTABLE) OR LESS (ADJUSTABLE) OF 55 PSI (ADJUSTABLE) START PUMP P2.
  6. IF THE SYSTEM PRESSURE FALLS BELOW 55 PSI FOR MORE THAN 15 MIN (ADJUSTABLE) OR 15 MIN (ADJUSTABLE) START PUMP P2.
  7. IF THE PRESSURE IS 65 PSI FOR 15 MIN AND THE LEAD PUMP IS AT SIZE (ADJUSTABLE) START STOP PUMP P2 AND RETURN TO NORMAL OPERATION.
- GENERATOR START STOP:**
1. THE P.C. WILL START THE GENERATOR WHEN THE SYSTEM PRESSURE IS 55 PSI (ADJUSTABLE) OR LESS (ADJUSTABLE) OF 55 PSI (ADJUSTABLE) START PUMP P2.

**ALARM:**

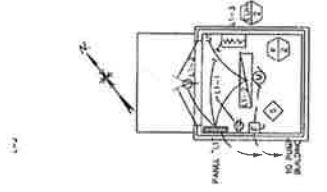
- ALARM FOR THE FOLLOWING CONDITIONS AND SHUT DOWN PUMPS:
1. FLOW / PRESSURE ABNORMALITY
  2. POWER LOSS
  3. ACTIVATION OF PUMP P2
  4. POWER LOSS
  5. GENERATOR STOP
  6. GENERATOR ALARM
  7. POWER LOSS ALARM LIGHTS IN HOUSE
  8. POWER LOSS TEST
  9. LOW SYSTEM PRESSURE
  10. HIGH SYSTEM PRESSURE
  11. GENERATOR ALARM



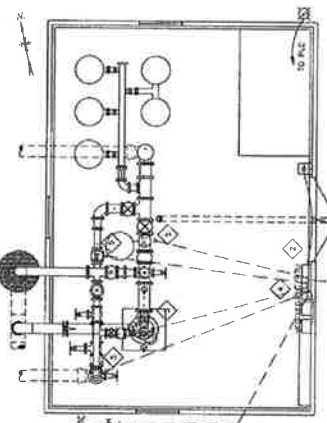
**LIGHTING FLOOR PLAN**  
 SCALE: 1/4" = 1'



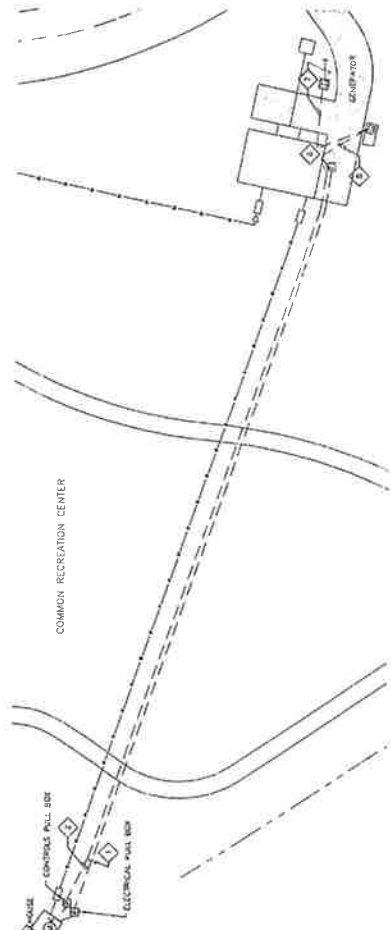
**POWER FLOOR PLAN**  
 SCALE: 1/4" = 1'



**WELLHOUSE ELEC. FLOOR PLAN**  
 SCALE: 1/4" = 1'



**CONTROLS FLOOR PLAN**  
 SCALE: 1/4" = 1'



**SITE PLAN**  
 SCALE: 1" = 20'

## Attachment B3 – Water Distribution System Plans

BLACKHAWK ON THE RIVER. PHASE III

WATER PLAN

**Riveridge Engineering Company**  
405 W. Myrtle St., Boise, Idaho 83702  
Ph. (208) 344-1188, Fax (208) 344-1182



The image shows a close-up of a document, possibly a ledger or a notebook page. It features a grid of horizontal lines, with some lines being thicker than others, creating a header section. There is some handwritten text in the top left corner, including what looks like a signature or initials. The document is slightly tilted and has a yellowish, aged appearance.

NOTES

1. THE FIRST 2 ARE WATER ACTIVITIES

2. ALL PROPOSED IS LIMITED TO THE EXISTING CIRCUMSTANCE

3. CONSIDER OF THE "STANDARD" ANY AT THE MARSHES WILL BE BASED ON THE "STANDARD" AS THE "STANDARD" SHALL BE

4. AS MUCH AS POSSIBLE TO BE



### LEGEND

- DATE RECEIVED \_\_\_\_\_  
 CITY RECEIVED \_\_\_\_\_  
 LAT. \_\_\_\_\_ LONG. \_\_\_\_\_  
 BY \_\_\_\_\_  
 FIELD NUMBER \_\_\_\_\_  
 SPECIES \_\_\_\_\_  
 SEX \_\_\_\_\_  
 AGE \_\_\_\_\_  
 COLOR \_\_\_\_\_  
 MARKS \_\_\_\_\_  
 MEASUREMENTS \_\_\_\_\_  
 WEIGHT \_\_\_\_\_  
 LENGTH \_\_\_\_\_  
 WIDTH \_\_\_\_\_  
 HEIGHT \_\_\_\_\_  
 THICKNESS \_\_\_\_\_  
 DENSITY \_\_\_\_\_  
 TEMPERATURE \_\_\_\_\_  
 HUMIDITY \_\_\_\_\_  
 WIND \_\_\_\_\_  
 CLOUDS \_\_\_\_\_  
 MOON \_\_\_\_\_  
 SUN \_\_\_\_\_  
 TIME \_\_\_\_\_  
 PLACE \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_  
 ZIP \_\_\_\_\_  
 COUNTRY \_\_\_\_\_  
 PHONE \_\_\_\_\_  
 FAX \_\_\_\_\_  
 E-MAIL \_\_\_\_\_  
 WEBSITE \_\_\_\_\_  
 OTHER \_\_\_\_\_  
 COMMENTS \_\_\_\_\_  
 PHOTO \_\_\_\_\_  
 SKETCH \_\_\_\_\_  
 MAP \_\_\_\_\_  
 OTHER \_\_\_\_\_  
 NAME \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_  
 STATE \_\_\_\_\_  
 ZIP \_\_\_\_\_  
 COUNTRY \_\_\_\_\_  
 PHONE \_\_\_\_\_  
 FAX \_\_\_\_\_  
 E-MAIL \_\_\_\_\_  
 WEBSITE \_\_\_\_\_  
 OTHER \_\_\_\_\_  
 COMMENTS \_\_\_\_\_  
 PHOTO \_\_\_\_\_  
 SKETCH \_\_\_\_\_  
 MAP \_\_\_\_\_  
 OTHER \_\_\_\_\_



|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
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**Riveridge Engineering Company**  
405 W. MYRTLE ST., SUITE 100, RIVERSIDE, CALIF. 92503  
PH. (714) 944-1100, FAX (714) 944-1101

# BLACKHAWK ON THE RIVER, PHASE I WATER PLAN

SHEET 17 OF 40

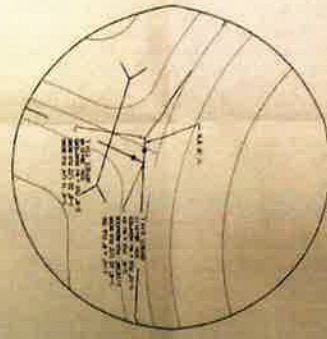
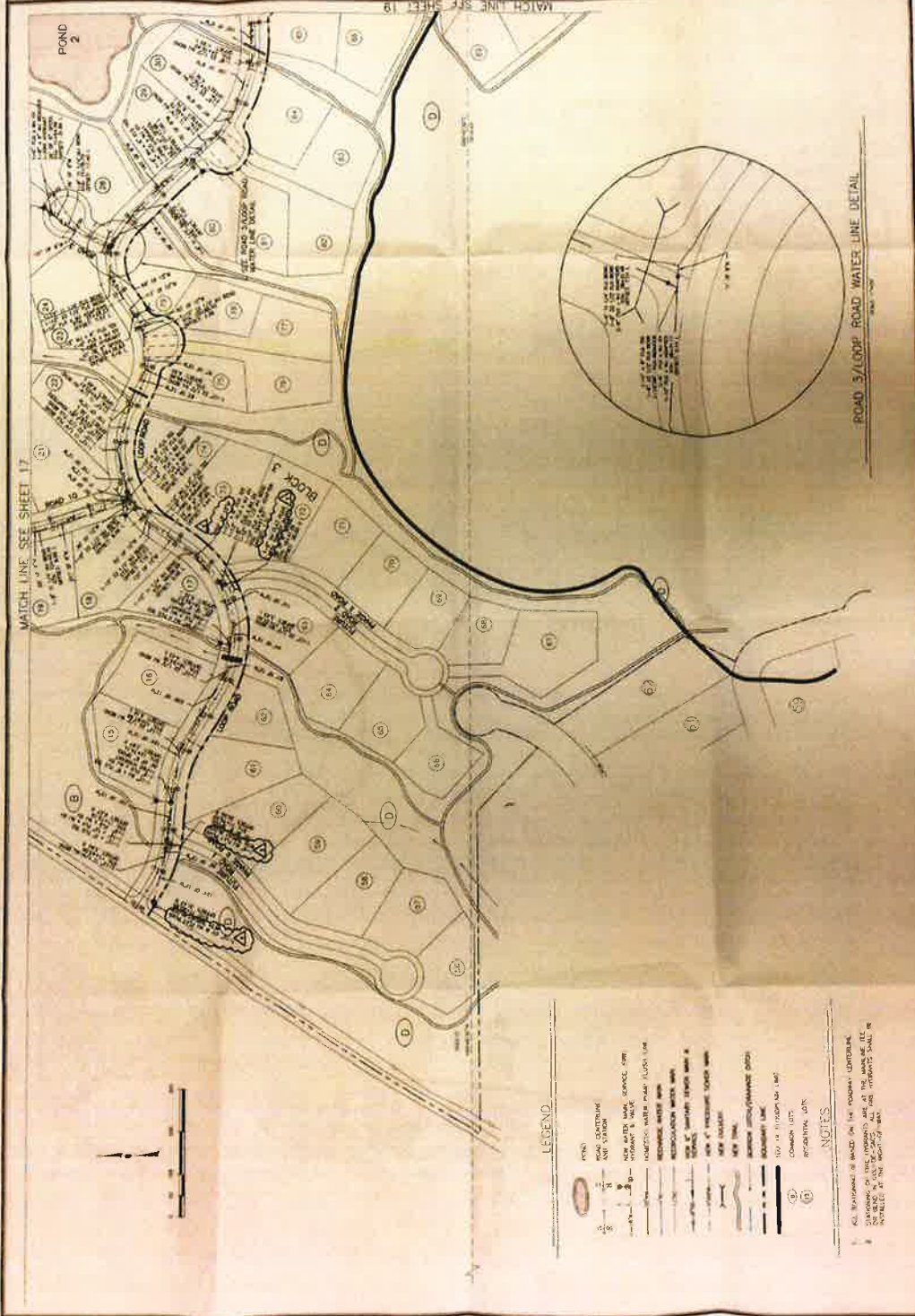


## LEGEND

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## NOTES

1. ALL DIMENSIONS ARE BASED ON THE SURVEY CONTROLS.
2. THE LOCATION OF THE PROPERTY LINES AND THE DIMENSIONS ARE BASED ON THE SURVEY CONTROLS.



**LEGEND**

- 1. POND
- 2. ROAD CENTERLINE AND WIDTH
- 3. NEW WATER MAIN, 24" DIA. 100' COVER
- 4. EXISTING WATER MAIN, 24" DIA. 100' COVER
- 5. EXISTING WATER MAIN, 18" DIA. 100' COVER
- 6. EXISTING WATER MAIN, 12" DIA. 100' COVER
- 7. EXISTING WATER MAIN, 8" DIA. 100' COVER
- 8. EXISTING WATER MAIN, 6" DIA. 100' COVER
- 9. EXISTING WATER MAIN, 4" DIA. 100' COVER
- 10. EXISTING WATER MAIN, 3" DIA. 100' COVER
- 11. EXISTING WATER MAIN, 2" DIA. 100' COVER
- 12. EXISTING WATER MAIN, 1" DIA. 100' COVER
- 13. EXISTING WATER MAIN, 1/2" DIA. 100' COVER
- 14. EXISTING WATER MAIN, 1/4" DIA. 100' COVER
- 15. EXISTING WATER MAIN, 1/8" DIA. 100' COVER
- 16. EXISTING WATER MAIN, 1/16" DIA. 100' COVER
- 17. EXISTING WATER MAIN, 1/32" DIA. 100' COVER
- 18. EXISTING WATER MAIN, 1/64" DIA. 100' COVER
- 19. EXISTING WATER MAIN, 1/128" DIA. 100' COVER
- 20. EXISTING WATER MAIN, 1/256" DIA. 100' COVER
- 21. EXISTING WATER MAIN, 1/512" DIA. 100' COVER
- 22. EXISTING WATER MAIN, 1/1024" DIA. 100' COVER
- 23. EXISTING WATER MAIN, 1/2048" DIA. 100' COVER
- 24. EXISTING WATER MAIN, 1/4096" DIA. 100' COVER
- 25. EXISTING WATER MAIN, 1/8192" DIA. 100' COVER
- 26. EXISTING WATER MAIN, 1/16384" DIA. 100' COVER
- 27. EXISTING WATER MAIN, 1/32768" DIA. 100' COVER
- 28. EXISTING WATER MAIN, 1/65536" DIA. 100' COVER
- 29. EXISTING WATER MAIN, 1/131072" DIA. 100' COVER
- 30. EXISTING WATER MAIN, 1/262144" DIA. 100' COVER
- 31. EXISTING WATER MAIN, 1/524288" DIA. 100' COVER
- 32. EXISTING WATER MAIN, 1/1048576" DIA. 100' COVER
- 33. EXISTING WATER MAIN, 1/2097152" DIA. 100' COVER
- 34. EXISTING WATER MAIN, 1/4194304" DIA. 100' COVER
- 35. EXISTING WATER MAIN, 1/8388608" DIA. 100' COVER
- 36. EXISTING WATER MAIN, 1/16777216" DIA. 100' COVER
- 37. EXISTING WATER MAIN, 1/33554432" DIA. 100' COVER
- 38. EXISTING WATER MAIN, 1/67108864" DIA. 100' COVER
- 39. EXISTING WATER MAIN, 1/134217728" DIA. 100' COVER
- 40. EXISTING WATER MAIN, 1/268435456" DIA. 100' COVER
- 41. EXISTING WATER MAIN, 1/536870912" DIA. 100' COVER
- 42. EXISTING WATER MAIN, 1/1073741824" DIA. 100' COVER
- 43. EXISTING WATER MAIN, 1/2147483648" DIA. 100' COVER
- 44. EXISTING WATER MAIN, 1/4294967296" DIA. 100' COVER
- 45. EXISTING WATER MAIN, 1/8589934592" DIA. 100' COVER
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- 62. EXISTING WATER MAIN, 1/1125899906842624" DIA. 100' COVER
- 63. EXISTING WATER MAIN, 1/2251799813685248" DIA. 100' COVER
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- 67. EXISTING WATER MAIN, 1/36028797018963968" DIA. 100' COVER
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- 190. EXISTING WATER MAIN, 1/383123885216472214589586756787577120840900802888352" DIA. 100' COVER
- 191. EXISTING WATER MAIN, 1/766247770432944429179173513575154241681801605776704" DIA. 100' COVER
- 192. EXISTING WATER MAIN, 1/1532495540865888858358347027150308483363603211553408" DIA. 100' COVER
- 193. EXISTING WATER MAIN, 1/3064991081731777716716694054300616966727206423106816" DIA. 100' COVER
- 194. EXISTING WATER MAIN, 1/6129982163463555433433388108601233933454412846213632" DIA. 100' COVER
- 195. EXISTING WATER MAIN, 1/12259964326927110866866776217202467866908825692427264" DIA. 100' COVER
- 196. EXISTING WATER MAIN, 1/24519928653854221733733552434404935733817651384854528" DIA. 100' COVER
- 197. EXISTING WATER MAIN, 1/49039857307708443467467104868809871467635302769709056" DIA. 100' COVER
- 198. EXISTING WATER MAIN, 1/98079714615416886934934209737619742935270605539418112" DIA. 100' COVER
- 199. EXISTING WATER MAIN, 1/196159429228833773869868419475239485870541211078836224" DIA. 100' COVER
- 200. EXISTING WATER MAIN, 1/392318858457667547739736838950478971741082422157672448" DIA. 100' COVER
- 201. EXISTING WATER MAIN, 1/784637716915335095479473677900957943482164844315344896" DIA. 100' COVER
- 202. EXISTING WATER MAIN, 1/1569275433830670190958947355801915886964329688630689792" DIA. 100' COVER
- 203. EXISTING WATER MAIN, 1/3138550867661340381917894711603831773928659377261379584" DIA. 100' COVER
- 204. EXISTING WATER MAIN, 1/6277101735322680763835789423207663547857318754522759168" DIA. 100' COVER
- 205. EXISTING WATER MAIN, 1/12554203470645361527671578846415327095714637509045518336" DIA. 100' COVER
- 206. EXISTING WATER MAIN, 1/25108406941290723055343157692830654191429275018091036672" DIA. 100' COVER
- 207. EXISTING WATER MAIN, 1/50216813882581446110686315385661308382858550036182073344" DIA. 100' COVER
- 208. EXISTING WATER MAIN, 1/100433627765162892221372630771322616765717100072364146688" DIA. 100' COVER
- 209. EXISTING WATER MAIN, 1/200867255530325784442745261542645233531434200144728293376" DIA. 100' COVER
- 210. EXISTING WATER MAIN, 1/401734511060651568885490523085290467062868400289456586752" DIA. 100' COVER
- 211. EXISTING WATER MAIN, 1/803469022121303137770981046170580934125736800578913173504" DIA. 100' COVER
- 212. EXISTING WATER MAIN, 1/1606938044242606755541962092341161868251473601157826347008" DIA. 100' COVER
- 213. EXISTING WATER MAIN, 1/3213876088485213511083924184682323736502947202315652694016" DIA. 100' COVER
-





## Attachment B4 – Well Driller Reports

IDAHO DEPARTMENT OF WATER RESOURCES  
**WELL DRILLER'S REPORT**

1. WELL TAG NO. D 0041733  
DRILLING PERMIT NO. 890321-835302  
Water Right or Injection Well No. 65-22945

2. OWNER:  
Name SAGE SGI, LLC  
Address 1220 20th STREET SE  
City SALEM State OR Zip 97302

3. LOCATION OF WELL by legal description: WELL #2

You must provide address or Lot, Blk, Sub. or Directions to well.

Twp. 18 North ☒ or South ☐  
Rge. 2 East ☒ or West ☐  
Sec. 25 1/4 SE 1/4 SE 1/4  
Gov't Lot \_\_\_\_\_ County VALLEY  
Lat: \_\_\_\_\_ Long: \_\_\_\_\_  
Address of Well Site LOOP ROAD City \_\_\_\_\_

(Give at least name of road + Distance to Road or Landmark)  
Lt. \_\_\_\_\_ Blk. \_\_\_\_\_ Sub. Name BLACKHAWK on the RIVER

4. USE:  
☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation  
☐ Thermal ☐ Injection ☒ Other PWS, FIRE PROTECTION

5. TYPE OF WORK check all that apply (Replacement etc.)  
☒ New Well ☐ Modify ☐ Abandonment ☐ Other \_\_\_\_\_

6. DRILL METHOD:  
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other REVERSE

7. SEALING PROCEDURES

| Seal Material | From | To  | Weight / Volume | Seal Placement Method |
|---------------|------|-----|-----------------|-----------------------|
| 1" BENTONITE  | 0    | 295 | 27,500          | DRY POUR              |
| 1" BENTONITE  | 356  | 366 | 800             |                       |

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) \_\_\_\_\_  
Was drive shoe seal tested? ☐ Y ☒ N How? \_\_\_\_\_

8. CASING/LINER: 20" X 10" REDUCER @ 285' to 288'

| Diameter | From | To  | Gauge | Material | Casing                              | Liner                    | Welded                              | Threaded                 |
|----------|------|-----|-------|----------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| 20"      | +3   | 285 | .375  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10"      | 288  | 321 | .365  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10"      | 351  | 376 | .365  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Length of Headpipe N/A Length of Tailpipe N/A  
Packer ☐ Y ☒ N Type \_\_\_\_\_

9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method \_\_\_\_\_  
Screen Type & Method of Installation JOHNSON WIRE WRAP

| From | To  | Slot Size | Number | Diameter | Material | Casing                              | Liner                    |
|------|-----|-----------|--------|----------|----------|-------------------------------------|--------------------------|
| 321  | 351 | .030      |        | 10"      | S.S.     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 376  | 456 | .030      |        | 10"      | S.S.     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

10. FILTER PACK

| Filter Material | From | To  | Weight / Volume | Placement Method |
|-----------------|------|-----|-----------------|------------------|
| #6-9 SAND       | 295  | 495 | 21,000          | DRY POUR         |

11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

\_\_\_\_\_ ft. below ground Artesian pressure 5.5 lb.  
Depth flow encountered \_\_\_\_\_ ft. Describe access port or control devices:  
8" FLANGE OFF SIDE w/ BUTTERFLY VALVE

Office Use Only  
Well ID No. 405812  
Inspected by \_\_\_\_\_  
Twp \_\_\_\_\_ Rge \_\_\_\_\_ Sec \_\_\_\_\_  
1/4 1/4 1/4  
Lat: \_\_\_\_\_ Long: \_\_\_\_\_

12. WELL TESTS:

| Yield gal./min. | Drawdown    | Pumping Level | Time           |
|-----------------|-------------|---------------|----------------|
| <u>1990 gpm</u> | <u>114'</u> | <u>92'</u>    | <u>5.5 hrs</u> |

Water Temp. \_\_\_\_\_ Bottom hole temp. \_\_\_\_\_  
Water Quality test or comments: \_\_\_\_\_

13. LITHOLOGIC LOG: (Describe repairs or abandonment)

| Bore Dia. | From | To  | Remarks: Lithology, Water Quality & Temperature | Water | Y | N |
|-----------|------|-----|-------------------------------------------------|-------|---|---|
| 28"       | 0    | 2   | TOP SOIL                                        |       |   |   |
|           | 2    | 119 | SAND, GRAVEL, SM LAYERS CLAY                    |       |   |   |
|           | 119  | 133 | BRN CLAY                                        |       |   |   |
|           | 133  | 145 | FINE-COARSE SAND                                |       |   |   |
|           | 145  | 152 | TAN CLAY                                        |       |   |   |
|           | 152  | 290 | FINE-COARSE SAND, PEAGRAVEL                     |       |   |   |
| 18"       | 290  | 314 | FINE-COARSE SAND, PEAGRAVEL, SM LAYERS CLAY     |       |   |   |
|           | 314  | 320 | BLUE CLAY                                       |       |   |   |
|           | 320  | 352 | FINE-MED SAND                                   |       |   |   |
|           | 352  | 375 | GREY CLAY w/ FINE SAND LAYERS                   |       |   |   |
|           | 375  | 458 | FINE-MED SAND, PEAGRAVEL                        |       |   |   |
|           | 458  | 463 | GREY CLAY                                       |       |   |   |
|           | 463  | 473 | FINE-MED SAND                                   |       |   |   |
|           | 473  | 477 | GREY CLAY                                       |       |   |   |
|           | 477  | 481 | FINE-COARSE SAND                                |       |   |   |
|           | 481  | 495 | GREY CLAY                                       |       |   |   |

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OCT 14 2005

WATER RESOURCES  
WESTERN REGION

Completed Depth 456' (Measurable)  
Date: Started 8-19-05 Completed 9-17-05

14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Ryan's Firm No. 333  
Principal Driller [Signature] Date 10-12-05  
and  
Driller or Operator II [Signature] Date \_\_\_\_\_  
Operator I [Signature] Date 10-12-05

Principal Driller and Rig Operator Required.  
Operator I must have signature of Driller/Operator II.

# IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

Office Use Only  
Well ID No. **405053**  
Inspected by \_\_\_\_\_  
Twp \_\_\_\_\_ Rge \_\_\_\_\_ Sec \_\_\_\_\_  
1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_ 1/4 \_\_\_\_\_  
Lat: \_\_\_\_\_ : \_\_\_\_\_ Long: \_\_\_\_\_ : \_\_\_\_\_

1. WELL TAG NO. D **0039525**  
DRILLING PERMIT NO. **889533-**  
Water Right or Injection Well No. \_\_\_\_\_

2. OWNER:  
Name **SAGE SG, INC.**  
Address **1220 20th STREET SE**  
City **SALEM** State **OR** Zip **97302**

3. LOCATION OF WELL by legal description: **WELL #1**  
You must provide address or Lot, Blk, Sub. or Directions to well.  
Twp. **18** North ☒ or South ☐  
Rge. **2** East ☒ or West ☐  
Sec. **25** 1/4 **SE** 1/4 **SE** 1/4  
Gov't Lot \_\_\_\_\_  
Lat: \_\_\_\_\_ : \_\_\_\_\_ Long: \_\_\_\_\_ : \_\_\_\_\_  
Address of Well Site **LOOP ROAD**

(Give at least name of road + Distance to Road or Landmark)  
City **McCall**  
Lt. \_\_\_\_\_ Blk. \_\_\_\_\_ Sub. Name **BLACKHAWK ON the RIVER**

4. USE:  
☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation  
☐ Thermal ☐ Injection ☒ Other **FIRE PROTECTION**

5. TYPE OF WORK check all that apply (Replacement etc.)  
☒ New Well ☐ Modify ☐ Abandonment ☐ Other \_\_\_\_\_

6. DRILL METHOD:  
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☒ Other **REVERSE**

## 7. SEALING PROCEDURES

| Seal Material     | From | To  | Weight | Volume | Seal Placement Method |
|-------------------|------|-----|--------|--------|-----------------------|
| 1" BENTONITE CAMP | 0    | 271 | 18.750 |        | DRY POUR              |
| 1" BENTONITE CAMP | 271  | 381 | 700    |        | DRY POUR              |

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) \_\_\_\_\_  
Was drive shoe seal tested? ☐ Y ☒ N How? \_\_\_\_\_

## 8. CASING/LINER:

| Diameter | From | To  | Gauge | Material | Casing                              | Liner                    | Welded                              | Threaded                 |
|----------|------|-----|-------|----------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| 12       | +2   | 275 | .375  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10       | 275  | 295 | .365  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10       | 295  | 355 | .365  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10       | 355  | 405 | .365  | STEEL    | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Length of Packer \_\_\_\_\_ Length of Tailpipe \_\_\_\_\_  
Packer ☐ Y ☒ N Type \_\_\_\_\_

## 9. PERFORATIONS/SCREENS PACKER TYPE

Perforation Method \_\_\_\_\_  
Screen Type & Method of Installation **JOHNSON WIRE WRAP**

| From | To  | Slot Size | Number | Diameter | Material | Casing                              | Liner                    |
|------|-----|-----------|--------|----------|----------|-------------------------------------|--------------------------|
| 295  | 345 | .030      |        | 10       | S.S.     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 355  | 365 | .030      |        | 10       | S.S.     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 405  | 455 | .030      |        | 10       | S.S.     | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

## 10. FILTER PACK

| Filter Material | From | To  | Weight | Volume | Placement Method |
|-----------------|------|-----|--------|--------|------------------|
| CSST #6-9 SAND  | 271  | 495 | 36.000 |        | DRY POUR         |

## 11. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

\_\_\_\_\_ ft. below ground Artesian pressure **4** lb.  
Depth flow encountered **293** ft. Describe access port or control devices:  
**BLIND FLANGES**

## 12. WELL TESTS:

| Yield gal./min. | Drawdown   | Pumping Level | Time         |
|-----------------|------------|---------------|--------------|
| <b>1700</b>     | <b>86'</b> | <b>74'</b>    | <b>2 hrs</b> |

Water Temp. **52°** Bottom hole temp. \_\_\_\_\_

Water Quality test or comments: \_\_\_\_\_

## 13. LITHOLOGIC LOG: (Describe repairs or abandonment)

| Bore Dia. | From | To  | Remarks: Lithology, Water Quality & Temperature | Y | N |
|-----------|------|-----|-------------------------------------------------|---|---|
| 22        | 0    | 1   | TOP SOIL                                        |   |   |
|           | 1    | 9   | GRAVEL                                          |   |   |
|           | 9    | 56  | MED-COARSE SAND, GRAVEL                         |   |   |
|           | 56   | 61  | BR + BLUE CLAY                                  |   |   |
|           | 61   | 65  | SAND, GRAVEL                                    |   |   |
|           | 65   | 88  | GRAY, BROWN CLAY LAYERS                         |   |   |
|           | 88   | 115 | MED SAND, PEA GRAVEL                            |   |   |
|           | 115  | 120 | SANDY BR CLAY                                   |   |   |
|           | 120  | 150 | MED SAND, PEA GRAVEL                            |   |   |
|           | 150  | 153 | DARK BR CLAY                                    |   |   |
|           | 153  | 174 | SAND, SM GRAVEL                                 |   |   |
|           | 174  | 193 | BROWN + GRAY CLAY LAYERS                        |   |   |
|           | 193  | 212 | SAND, SM GRAVEL                                 |   |   |
|           | 212  | 222 | TAN + BLACK CLAY                                |   |   |
|           | 222  | 234 | SAND, SM GRAVEL                                 |   |   |
|           | 234  | 255 | BR CLAY                                         |   |   |
|           | 255  | 270 | MED-COARSE SAND, PEA GRAVEL                     |   |   |
|           | 270  | 293 | BR CLAY + SAND LAYERS                           |   |   |
|           | 293  | 323 | FINE-MED SAND, PEA GRAVEL                       |   |   |
|           | 323  | 326 | BLUE CLAY                                       |   |   |
|           | 326  | 457 | FINE-COARSE SAND w/ sm clay layers              |   |   |
|           | 457  | 472 | GRAY CLAY                                       |   |   |
|           | 472  | 475 | SAND, CLAY MIX                                  |   |   |
|           | 475  | 495 | GRAY CLAY                                       |   |   |

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WATER RESOURCES  
WESTERN REGION

Completed Depth **455'** (Measurable)  
Date: Started **7-19-05** Completed **8-22-05**

## 14. DRILLER'S CERTIFICATION

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name **RIVERSIDE INC** Firm No. **333**  
Principal Driller \_\_\_\_\_ Date **8-30-05**  
and \_\_\_\_\_  
Driller or Operator \_\_\_\_\_ Date \_\_\_\_\_  
Operator I **Keni Chastin** Date **8-30-05**

Principal Driller and Rig Operator Required.

Operator I must have signature of Driller/Operator II.

## Attachment B5 – Well Test Data

**BLACKHAWK ON THE RIVER WELL NO. 1 (WEST WELL)  
STEP-RATE PUMPING TEST 8/20/05**

Pumping Equipment - diesel driven line-shaft turbine pump, 258-foot setting  
Water level measuring point is 0.3 feet above top of casing; top of casing is 3.3 feet above ground  
Flow measured with 10" x 6" orifice; 10" x 7" orifice  
Water level measured with electric line well sounder

| Time  | Elapsed<br>Time<br>(minutes) | Depth to<br>Water<br>(feet) | Draw-<br>down<br>(feet) | Pumping<br>Rate<br>(gpm) | Specific<br>Capacity<br>(gpm/ft) | Remarks                                                                                                |
|-------|------------------------------|-----------------------------|-------------------------|--------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------|
| 9:35  |                              | -9                          |                         |                          |                                  | shut in pressure reported to be 4 psi @ approx 2.8 feet agl<br>opened valve to let water into mainline |
| 9:45  |                              |                             |                         | 75                       |                                  | no water at orifice; 4 seconds to fill 5 gal bucket at overflow                                        |
| 10:09 | 0                            |                             |                         |                          |                                  | started step test                                                                                      |
| 10:10 | 1                            | 19.00                       | 28.00                   | 850                      | 30                               |                                                                                                        |
| 10:11 | 2                            | 20.75                       | 29.75                   | 850                      | 29                               | 550 rpm                                                                                                |
| 10:12 | 3                            | 22.00                       | 31.00                   | 850                      | 27                               | 37" on tube ; 550 rpm                                                                                  |
| 10:13 | 4                            | 22.25                       | 31.25                   | 850                      | 27                               | very little color; 550 rpm                                                                             |
| 10:14 | 5                            | 22.75                       | 31.75                   | 850                      | 27                               | 550 rpm                                                                                                |
| 10:15 | 6                            | 23.17                       | 32.17                   | 850                      | 26                               |                                                                                                        |
| 10:16 | 7                            | 23.33                       | 32.33                   | 850                      | 26                               |                                                                                                        |
| 10:17 | 8                            | 23.83                       | 32.83                   | 850                      | 26                               | 550 rpm                                                                                                |
| 10:18 | 9                            | 24.08                       | 33.08                   | 850                      | 26                               | 550 rpm                                                                                                |
| 10:19 | 10                           |                             |                         |                          |                                  | adjusting                                                                                              |
| 10:20 | 11                           |                             |                         | 880                      |                                  | 39.5" on tube                                                                                          |
| 10:23 | 14                           |                             |                         | 1030                     |                                  | stepped up to 54" on tube; no color, water is crystal clear                                            |
| 10:27 | 18                           | 29.00                       | 38.00                   | 1030                     | 27                               | 700 rpm                                                                                                |
| 10:28 | 19                           | 29.29                       | 38.29                   | 1030                     | 27                               |                                                                                                        |
| 10:29 | 20                           | 29.54                       | 38.54                   | 1030                     | 27                               | 700 rpm                                                                                                |
| 10:30 | 21                           | 29.83                       | 38.83                   | 1030                     | 27                               |                                                                                                        |
| 10:32 | 23                           | 30.17                       | 39.17                   | 1030                     | 26                               | 700 rpm                                                                                                |
| 10:37 | 28                           | 30.67                       | 39.67                   | 1030                     | 26                               |                                                                                                        |
| 10:42 | 33                           | 30.92                       | 39.92                   | 1030                     | 26                               | 700 rpm                                                                                                |
| 10:47 | 38                           | 30.92                       | 39.92                   | 1030                     | 26                               | 700 rpm                                                                                                |
| 10:50 | 41                           |                             |                         | 1180                     |                                  | stepped up to 71"                                                                                      |
| 10:50 | 41                           | 31.00                       | 40.00                   | 1180                     | 30                               |                                                                                                        |
| 10:55 | 46                           | 38.17                       | 47.17                   | 1180                     | 25                               | adjusted 800 rpm                                                                                       |
| 11:05 | 56                           | 38.42                       | 47.42                   | 1180                     | 25                               | 800 rpm                                                                                                |
| 11:12 | 63                           |                             |                         |                          |                                  | surge well; 6 times                                                                                    |
| 11:14 | 65                           |                             |                         |                          |                                  | shutdown to rawhide                                                                                    |
| 11:17 | 68                           |                             |                         |                          |                                  | startup                                                                                                |
| 11:17 | 68                           | 38.75                       | 47.75                   |                          |                                  |                                                                                                        |
| 11:20 | 71                           |                             |                         |                          |                                  | no color; shutdown to recover                                                                          |
| 11:25 | 76                           |                             |                         |                          |                                  | startup to 300 gpm                                                                                     |
| 11:28 | 79                           | 10.08                       | 19.08                   | 300                      | 16                               | 500 rpm; start step test; valved back                                                                  |
| 11:40 | 91                           | 8.67                        | 17.67                   | 300                      | 17                               |                                                                                                        |
| 11:45 | 96                           | 8.33                        | 17.33                   | 300                      | 17                               | 500 rpm                                                                                                |
| 11:55 | 106                          | 8.00                        | 17.00                   | 300                      | 18                               |                                                                                                        |
| 11:55 | 106                          |                             |                         | 500                      |                                  | adjusting; opening valve; stepped up to 500 gpm                                                        |
| 12:00 | 111                          | 14.33                       | 23.33                   | 500                      | 21                               |                                                                                                        |
| 12:10 | 121                          | 14.79                       | 23.79                   | 500                      | 21                               |                                                                                                        |
| 12:20 | 131                          | 14.92                       | 23.92                   | 500                      | 21                               |                                                                                                        |
| 12:30 | 141                          | 15.13                       | 24.13                   | 500                      | 21                               |                                                                                                        |
| 12:31 | 142                          |                             |                         | 830                      |                                  | stepped up to 830 gpm; switched to a 10" x 7" orifice                                                  |
| 12:35 | 146                          | 25.67                       | 34.67                   | 830                      | 24                               | 600 rpm                                                                                                |
| 12:45 | 156                          | 26.83                       | 35.83                   | 830                      | 23                               |                                                                                                        |
| 13:02 | 173                          | 27.33                       | 36.33                   | 1910                     |                                  | Stepped up to wide open; 89 1/2" on tube; 10" x 7" orifice                                             |
| 13:04 | 175                          |                             |                         |                          |                                  | adjusting                                                                                              |
| 13:05 | 176                          | 64.00                       | 73.00                   | 1910                     | 26                               | 1300 rpm; 89 1/2 "                                                                                     |
| 13:08 | 179                          | 64.67                       | 73.67                   | 1910                     | 26                               | 1300 rpm                                                                                               |
| 13:10 | 181                          |                             |                         |                          |                                  | sounder stuck                                                                                          |
| 13:39 | 210                          |                             |                         | 1910                     |                                  | 89 1/2"                                                                                                |
| 13:53 | 224                          | 72.00                       | 81.00                   | 1920                     | 24                               | 90 inches; 1300 rpm                                                                                    |
| 13:57 | 228                          | 72.75                       | 81.75                   | 1920                     | 23                               | 90 inches; 1300 rpm                                                                                    |
| 14:00 | 231                          |                             |                         | 1910                     |                                  | 89 1/2"; shutdown                                                                                      |

**BLACKHAWK ON THE RIVER WEST WELL  
CONSTANT-RATE PUMPING TEST 8/21/2005**

Pumping Equipment - diesel driven line-shaft turbine pump, 258-foot setting  
Water level measuring point is top of casing; approximately 3.3 feet above ground  
Flow measured with 10" x 7" orifice  
Water level measured with electric line well sounder

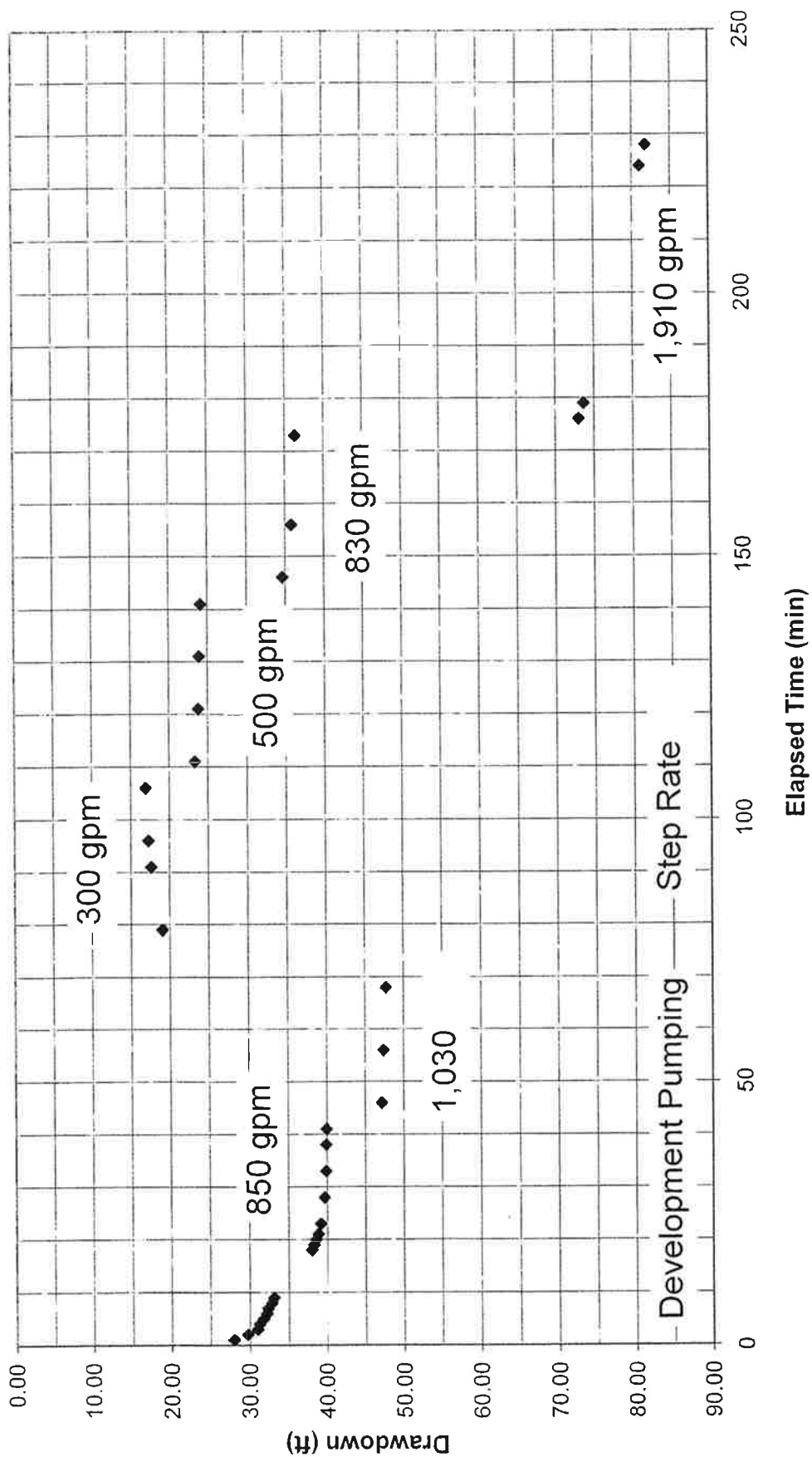
| Time  | Elapsed<br>Time<br>(minutes) | Depth to<br>Water<br>(feet) | Draw-<br>down<br>(feet) | Pumping<br>Rate<br>(gpm) | Remarks                                                                                   |
|-------|------------------------------|-----------------------------|-------------------------|--------------------------|-------------------------------------------------------------------------------------------|
|       |                              | -9                          |                         | Static                   | Shut in pressure of 4 psi                                                                 |
| 9:08  |                              | 1.7                         | 10.70                   | 150                      | w.l. = 1.7' while flowing 5 gal/2 sec (150 gpm); mp ≈ 3.3' agl; edge of discharge head on |
| 9:11  | 0                            |                             |                         |                          |                                                                                           |
| 9:12  | 1                            | 24.00                       | 33.00                   |                          |                                                                                           |
| 9:13  | 2                            |                             |                         |                          | adjusting flow up                                                                         |
| 9:15  | 4                            | 49.00                       | 58.00                   |                          |                                                                                           |
| 9:16  | 5                            | 50.45                       | 59.45                   |                          |                                                                                           |
| 9:17  | 6                            | 51.63                       | 60.63                   |                          |                                                                                           |
| 9:18  | 7                            | 52.48                       | 61.48                   |                          |                                                                                           |
| 9:19  | 8                            | 53.09                       | 62.09                   |                          |                                                                                           |
| 9:20  | 9                            | 53.59                       | 62.59                   |                          |                                                                                           |
| 9:21  | 10                           | 54.02                       | 63.02                   |                          |                                                                                           |
| 9:22  | 11                           | 54.52                       | 63.52                   |                          |                                                                                           |
| 9:23  | 12                           | 55.00                       | 64.00                   |                          |                                                                                           |
| 9:26  | 15                           | 55.40                       | 64.40                   |                          |                                                                                           |
| 9:30  | 19                           | 56.83                       | 65.83                   | 1690                     | CLEAR; 70"                                                                                |
| 9:35  | 24                           | 58.00                       | 67.00                   |                          |                                                                                           |
| 9:39  | 28                           | 58.42                       | 67.42                   |                          |                                                                                           |
| 9:41  | 30                           | 58.80                       | 67.80                   |                          |                                                                                           |
| 9:45  | 34                           | 59.45                       | 68.45                   |                          |                                                                                           |
| 9:50  | 39                           | 58.58                       | 67.58                   |                          |                                                                                           |
| 9:55  | 44                           | 59.00                       | 68.00                   |                          |                                                                                           |
| 10:00 | 49                           | 59.50                       | 68.50                   |                          |                                                                                           |
| 10:05 | 54                           | 59.92                       | 68.92                   |                          |                                                                                           |
| 10:10 | 59                           | 60.42                       | 69.42                   |                          |                                                                                           |
| 10:15 | 64                           | 60.68                       | 69.68                   |                          |                                                                                           |
| 10:20 | 69                           | 61.06                       | 70.06                   |                          |                                                                                           |
| 10:25 | 74                           | 61.37                       | 70.37                   | 1670                     | 68 1/2"                                                                                   |
| 10:32 | 81                           | 61.75                       | 70.75                   |                          | adjusting flow up                                                                         |
| 10:34 | 83                           | 62.68                       | 71.68                   | 1700                     | 70-71                                                                                     |
| 10:44 | 93                           | 63.28                       | 72.28                   | 1700                     | 71                                                                                        |
| 10:50 | 99                           | 63.58                       | 72.58                   |                          |                                                                                           |
| 11:00 | 109                          | 64.04                       | 73.04                   |                          | EC = 99; T = 11.4; SC = 130                                                               |
| 11:10 | 119                          | 64.55                       | 73.55                   |                          |                                                                                           |
| 11:20 | 129                          | 65.08                       | 74.08                   |                          |                                                                                           |
| 11:35 | 144                          | 65.57                       | 74.57                   |                          |                                                                                           |
| 11:47 | 156                          | 66.00                       | 75.00                   |                          |                                                                                           |
| 12:00 | 169                          | 66.50                       | 75.50                   |                          |                                                                                           |
| 12:15 | 184                          | 66.50                       | 75.50                   |                          |                                                                                           |
| 12:35 | 204                          | 66.85                       | 75.85                   |                          | Sampled for W.Q.                                                                          |
| 12:45 | 214                          | 67.45                       | 76.45                   |                          | EC = 98; T = 11.3; SC = 129                                                               |
| 12:50 | 219                          | 69.32                       | 78.32                   |                          | pH = 6.68 and drifting up                                                                 |
| 12:54 | 223                          |                             |                         |                          | pH = 6.76                                                                                 |
| 12:59 | 228                          |                             |                         |                          | pH = 6.81                                                                                 |
| 13:00 | 229                          | 69.53                       | 78.53                   | 1690                     | 69 3/4"                                                                                   |
| 13:08 | 237                          | 68.36                       | 77.36                   |                          |                                                                                           |
| 13:15 | 244                          | 68.78                       | 77.78                   |                          |                                                                                           |
| 13:30 | 259                          | 70.70                       | 79.70                   |                          |                                                                                           |
| 13:45 | 274                          | 71.00                       | 80.00                   |                          |                                                                                           |
| 14:00 | 289                          | 69.84                       | 78.84                   |                          |                                                                                           |
| 14:15 | 304                          | 70.16                       | 79.16                   |                          |                                                                                           |
| 14:21 | 310                          | 71.36                       | 80.36                   |                          |                                                                                           |
| 14:22 | 311                          | 70.95                       | 79.95                   |                          |                                                                                           |
| 14:30 | 319                          | 70.13                       | 79.13                   |                          |                                                                                           |
| 14:45 | 334                          | 69.74                       | 78.74                   | 1650                     | 67"                                                                                       |
| 14:49 | 338                          |                             |                         | 1700                     | adj up to 71"                                                                             |
| 14:50 | 339                          | 71.74                       | 80.74                   |                          |                                                                                           |
| 15:02 | 351                          | 72.00                       | 81.00                   |                          |                                                                                           |
| 15:15 | 364                          | 72.25                       | 81.25                   |                          |                                                                                           |
| 15:30 | 379                          | 72.50                       | 81.50                   |                          |                                                                                           |
| 15:45 | 394                          | 72.71                       | 81.71                   |                          |                                                                                           |
| 16:00 | 409                          | 73.16                       | 82.16                   |                          |                                                                                           |
| 16:15 | 424                          | 73.45                       | 82.45                   | 1700                     | 71                                                                                        |
| 16:30 | 439                          | 73.75                       | 82.75                   |                          | 11.4/99/130                                                                               |

| Time  | Elapsed Time<br>(minutes) | Depth to Water<br>(feet) | Draw-down<br>(feet) | Pumping Rate<br>(gpm) | Remarks |
|-------|---------------------------|--------------------------|---------------------|-----------------------|---------|
| 16:45 | 454                       | 73.99                    | 82.99               |                       |         |
| 17:00 | 469                       | 74.08                    | 83.08               |                       |         |
| 17:06 | 475                       |                          |                     | 1700                  | 70-71"  |
| 17:09 | 478                       | 74.20                    | 83.20               |                       |         |
| 17:10 | 479                       |                          |                     |                       | Off     |

| Time     | t   | t'   | t/t' | Depth to Water<br>(feet) | Residual Drawdown<br>(feet) |
|----------|-----|------|------|--------------------------|-----------------------------|
| 17:10:30 | 480 | 0.5  | 959  | 29.00                    | 38.00                       |
| 17:11    | 480 | 1.0  | 480  | 23.50                    | 32.50                       |
| 17:11:30 | 481 | 1.5  | 320  | 22.10                    | 31.10                       |
| 17:12    | 481 | 2.0  | 241  | 21.10                    | 30.10                       |
| 17:13    | 482 | 3.0  | 161  | 19.30                    | 28.30                       |
| 17:14    | 483 | 4.0  | 121  | 18.19                    | 27.19                       |
| 17:15    | 484 | 5.0  | 97   | 17.17                    | 26.17                       |
| 17:16    | 485 | 6.0  | 81   | 16.45                    | 25.45                       |
| 17:17    | 486 | 7.0  | 69   | 16.00                    | 25.00                       |
| 17:18    | 487 | 8.0  | 61   | 15.48                    | 24.48                       |
| 17:19    | 488 | 9.0  | 54   | 14.97                    | 23.97                       |
| 17:21    | 490 | 11.0 | 45   | 14.25                    | 23.25                       |
| 17:23    | 492 | 13.0 | 38   | 13.65                    | 22.65                       |
| 17:25    | 494 | 15.0 | 33   | 13.09                    | 22.09                       |
| 17:27    | 496 | 17.0 | 29   | 12.60                    | 21.60                       |
| 17:30    | 499 | 20.0 | 25   | 11.99                    | 20.99                       |
| 17:33    | 502 | 23.0 | 22   | 11.46                    | 20.46                       |
| 17:36    | 505 | 26.0 | 19   | 11.02                    | 20.02                       |
| 17:39    | 508 | 29.0 | 18   | 10.59                    | 19.59                       |
| 17:43    | 512 | 33.0 | 16   | 10.14                    | 19.14                       |
| 17:48    | 517 | 38.0 | 14   | 9.53                     | 18.53                       |
| 17:53    | 522 | 43.0 | 12   | 9.10                     | 18.10                       |
| 17:59    | 528 | 49.0 | 11   | 8.61                     | 17.61                       |
| 18:06    | 535 | 56.0 | 10   | 8.03                     | 17.03                       |
| 18:12    | 541 | 62.0 | 9    | 7.83                     | 16.83                       |
| 18:16    | 545 | 66.0 | 8    | 7.54                     | 16.54                       |
| 18:25    | 554 | 75.0 | 7    | 6.97                     | 15.97                       |
| 18:35    | 564 | 85.0 | 7    | 6.64                     | 15.64                       |
| 18:40    | 569 | 90.0 | 6    | 6.42                     | 15.42                       |
| 18:44    | 573 | 94.0 | 6    | 6.25                     | 15.25                       |

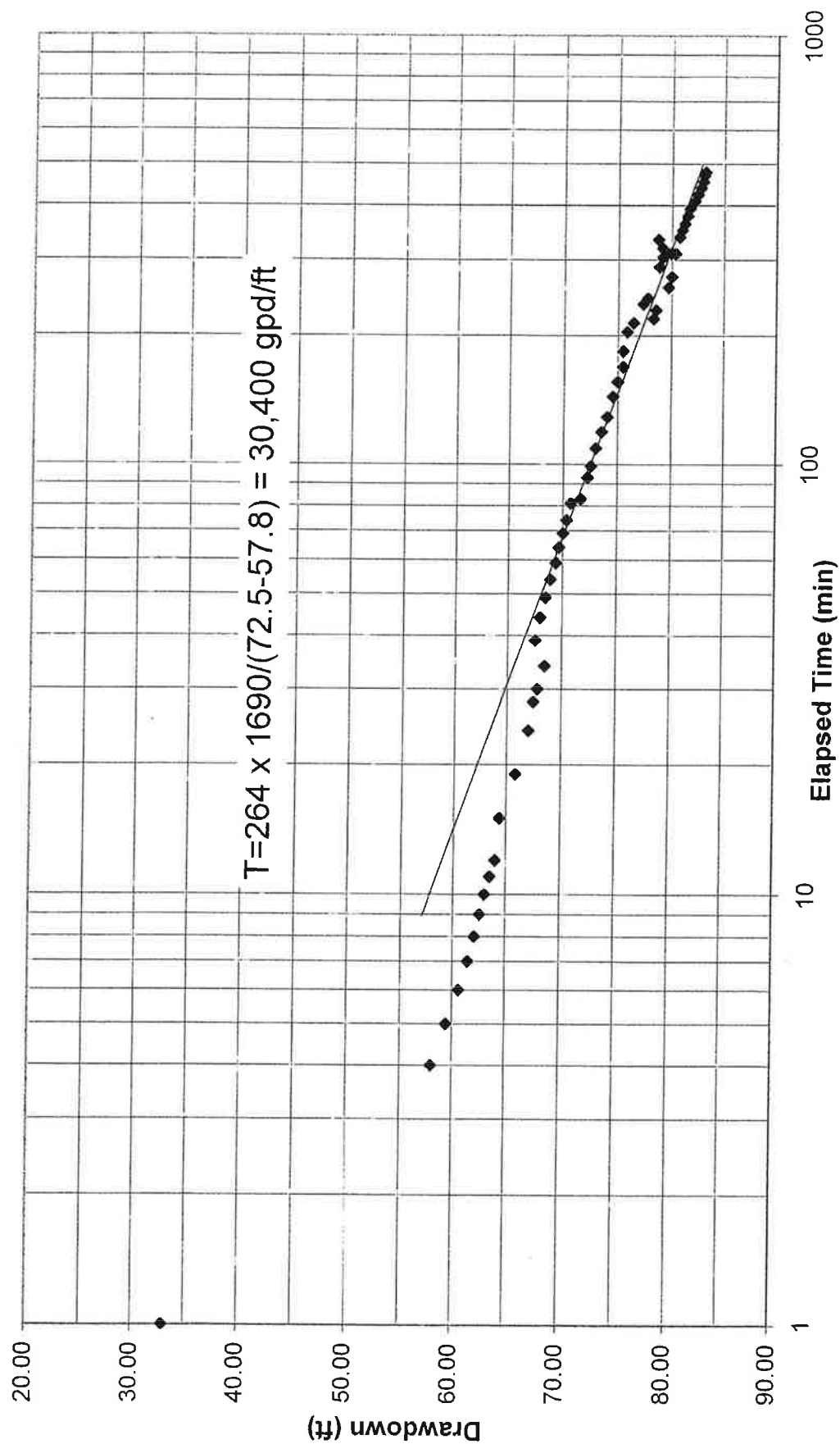
# Blackhawk on the River West Well

Step Rate Test 8/20/05



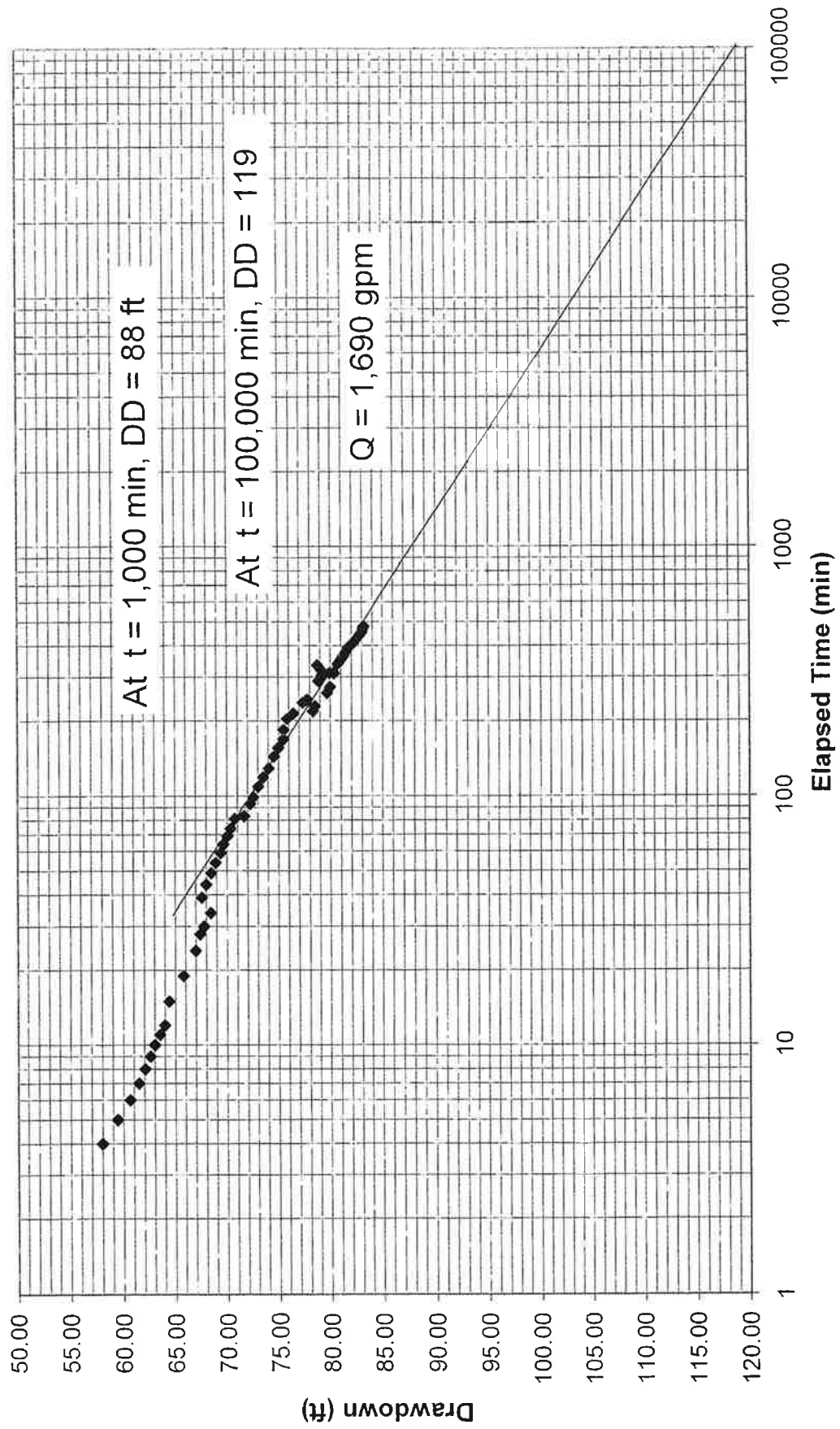
# Blackhawk on the River West Well

Constant Rate Test 8/21/2005



# Blackhawk on the River West Well

Constant Rate Test 8/21/2005



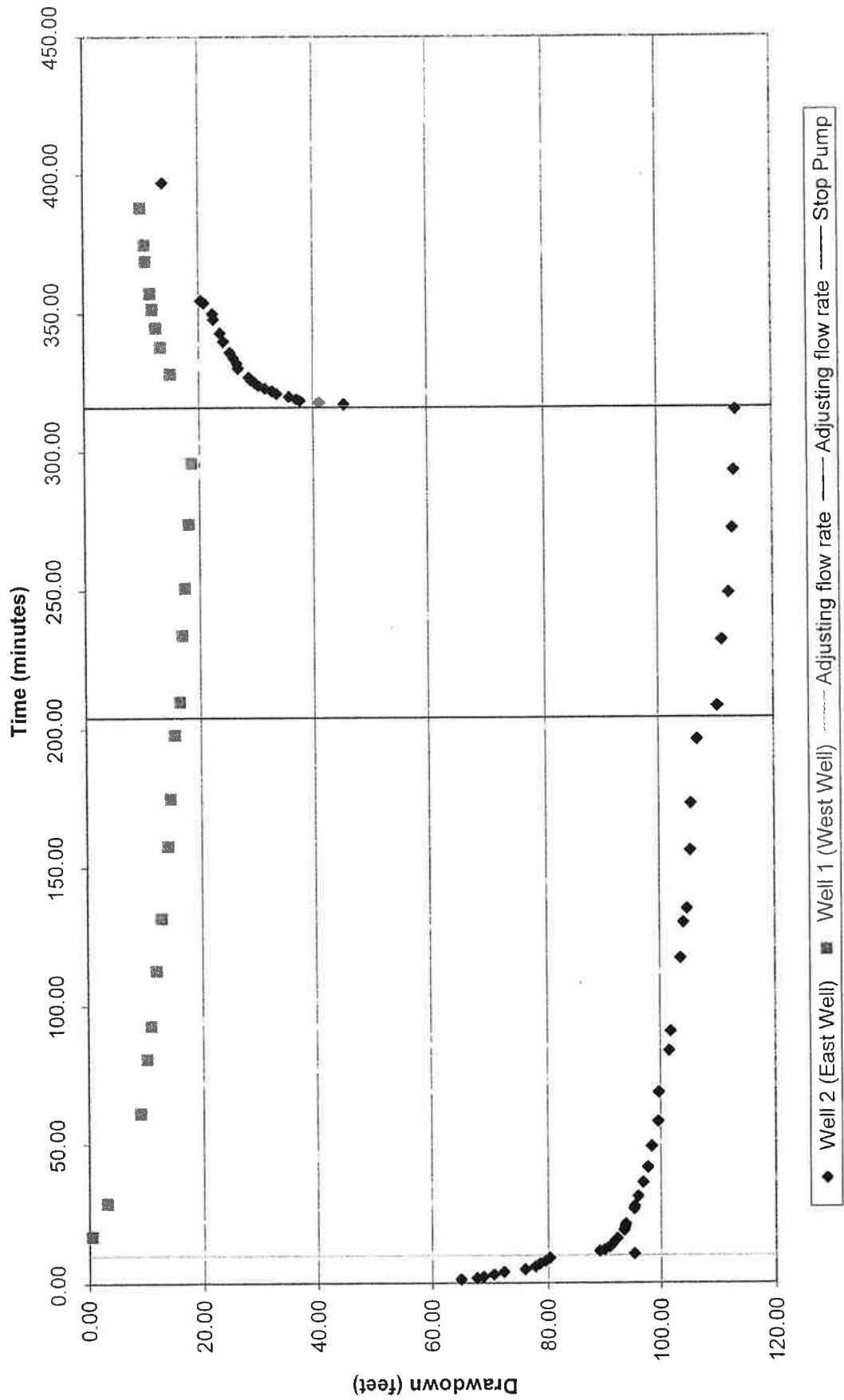
Pump intake set at 200 feet BGS  
Well 2 pressure gage is 44 inches (3.67 feet) above ground level (AGL)  
Well 2 water level measurement point is 21 inches AGL and 9 inches laterally; subtract 2.5 feet  
Well 1 pressure gage is 2.0 feet AGL  
Well 1 discharging pipe invert is approximately 0.25 feet AGL  
Well 1 water level measurement point is 3 inches AGL and 17 inches laterally; subtract 1.67 feet  
Well 1 water level measurement point is 10" x 8" orifice and pilot tube. Orifice coefficient of 0.744 assumed.  
Flow rate measured with a 10" x 8" orifice and pilot tube.

| Date      | Time  | Elapsed Time from Pump Start (min) | Elapsed Time from Pump Stop (min) | ty' | Well 2 (East Well Readings) |                           |                        |                 | Well 1 (West Well Readings) |                             |                           |                        | Flow Measurements |                              | Comments  |                                                                                                                                                    |
|-----------|-------|------------------------------------|-----------------------------------|-----|-----------------------------|---------------------------|------------------------|-----------------|-----------------------------|-----------------------------|---------------------------|------------------------|-------------------|------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|           |       |                                    |                                   |     | Pressure Gage Reading (psi) | Depth to Water (feet BMP) | Water Level (feet BGS) | Drawdown (feet) | Specific Capacity (gpm/ft)  | Pressure Gage Reading (psi) | Depth to Water (feet BMP) | Water Level (feet BGS) | Drawdown (feet)   | Orifice Measurement (inches) |           | Flow Rate (gpm)                                                                                                                                    |
| 9/16/2005 | 13:13 |                                    |                                   |     |                             |                           |                        |                 |                             |                             | 3.1                       |                        | -9.15             |                              |           |                                                                                                                                                    |
|           | 13:42 |                                    |                                   |     |                             |                           |                        |                 |                             |                             | 3.2                       |                        | -9.39             |                              |           |                                                                                                                                                    |
|           | 13:45 |                                    |                                   |     | 8                           |                           | -22.13                 |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:25 | 0:00                               |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:27 | 2:00                               |                                   |     |                             | 32                        | 29.5                   | 51.6            | 24                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:28 | 3:00                               |                                   |     |                             | 33                        | 30.5                   | 52.6            | 23                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:29 | 4:00                               |                                   |     |                             | 35                        | 32.5                   | 54.8            | 23                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:30 | 5:00                               |                                   |     |                             | 34                        | 31.5                   | 53.6            | 23                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:31 | 6:00                               |                                   |     |                             | 34                        | 31.5                   | 53.6            | 23                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:35 | 10:00                              |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:40 | 15:00                              |                                   |     |                             | 95                        | 92.5                   | 114.6           | 23                          |                             |                           |                        |                   | 17                           | 1237      |                                                                                                                                                    |
|           | 14:42 | 17:00                              |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:43 | 18:00                              |                                   |     |                             | 96                        | 93.5                   | 115.6           | 22                          |                             |                           |                        |                   | 74                           | 2580      |                                                                                                                                                    |
|           | 14:45 | 20:00                              |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
| 14:47     | 22:00 |                                    |                                   |     | 51                          | 48.5                      | 70.6                   |                 |                             |                             |                           |                        |                   |                              | rawhiding |                                                                                                                                                    |
| 14:52     |       |                                    |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           | shut down to repair elbow downstream of pump discharge; restarted then shut down to move mainline because of erosion and sediment control concerns |
| 9/17/2005 | 7:47  |                                    |                                   |     | 8                           |                           | -22.13                 |                 |                             |                             | 2.5                       |                        | -7.77             |                              |           |                                                                                                                                                    |
|           | 8:00  | 0:00                               |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           | Start constant rate pump test                                                                                                                      |
|           |       | 1:25                               |                                   |     |                             | 45.3                      | 42.8                   | 64.9            | 31                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 1:75                               |                                   |     |                             | 48.1                      | 45.6                   | 67.7            | 30                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 2:25                               |                                   |     |                             | 49.2                      | 46.7                   | 68.8            | 29                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 3:00                               |                                   |     |                             | 51.0                      | 48.5                   | 70.6            | 28                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 4:00                               |                                   |     |                             | 52.7                      | 50.2                   | 72.3            | 28                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 5:00                               |                                   |     |                             | 56.4                      | 53.9                   | 76.0            | 26                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 6:00                               |                                   |     |                             | 58.1                      | 55.6                   | 77.7            | 26                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 7:00                               |                                   |     |                             | 58.9                      | 56.4                   | 78.5            | 25                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 8:00                               |                                   |     |                             | 59.9                      | 57.4                   | 79.5            | 25                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 9:00                               |                                   |     |                             | 60.6                      | 58.1                   | 80.2            | 25                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 10:50                              |                                   |     |                             | 75.7                      | 73.2                   | 95.3            | 21                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           |       | 11:50                              |                                   |     |                             | 69.5                      | 67.0                   | 89.1            | 22                          |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 12:00 |                                    |                                   |     | 70.4                        | 67.9                      | 90.0                   | 22              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 13:00 |                                    |                                   |     | 71.3                        | 68.8                      | 90.9                   | 22              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 14:00 |                                    |                                   |     | 71.8                        | 69.3                      | 91.4                   | 22              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 15:00 |                                    |                                   |     | 72.2                        | 69.7                      | 91.8                   | 22              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 16:00 |                                    |                                   |     | 72.7                        | 70.2                      | 92.3                   | 22              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 17:25 |                                    |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 19:00 |                                    |                                   |     | 73.9                        | 71.4                      | 93.5                   | 21              |                             |                             | 2.3                       | -7.31                  | 0.46              |                              |           |                                                                                                                                                    |
|           | 20:00 |                                    |                                   |     | 74.0                        | 71.5                      | 93.6                   | 21              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 21:00 |                                    |                                   |     | 74.2                        | 71.7                      | 93.8                   | 21              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 24:00 |                                    |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 26:50 |                                    |                                   |     | 75.7                        | 73.2                      | 95.3                   | 21              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 27:50 |                                    |                                   |     | 75.8                        | 73.3                      | 95.4                   | 21              |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 29:25 |                                    |                                   |     |                             |                           |                        |                 |                             |                             |                           |                        |                   |                              |           |                                                                                                                                                    |
|           | 31:00 |                                    |                                   |     | 76.4                        | 73.9                      | 96.0                   | 21              |                             |                             | 1.1                       | -4.54                  | 3.23              |                              |           |                                                                                                                                                    |

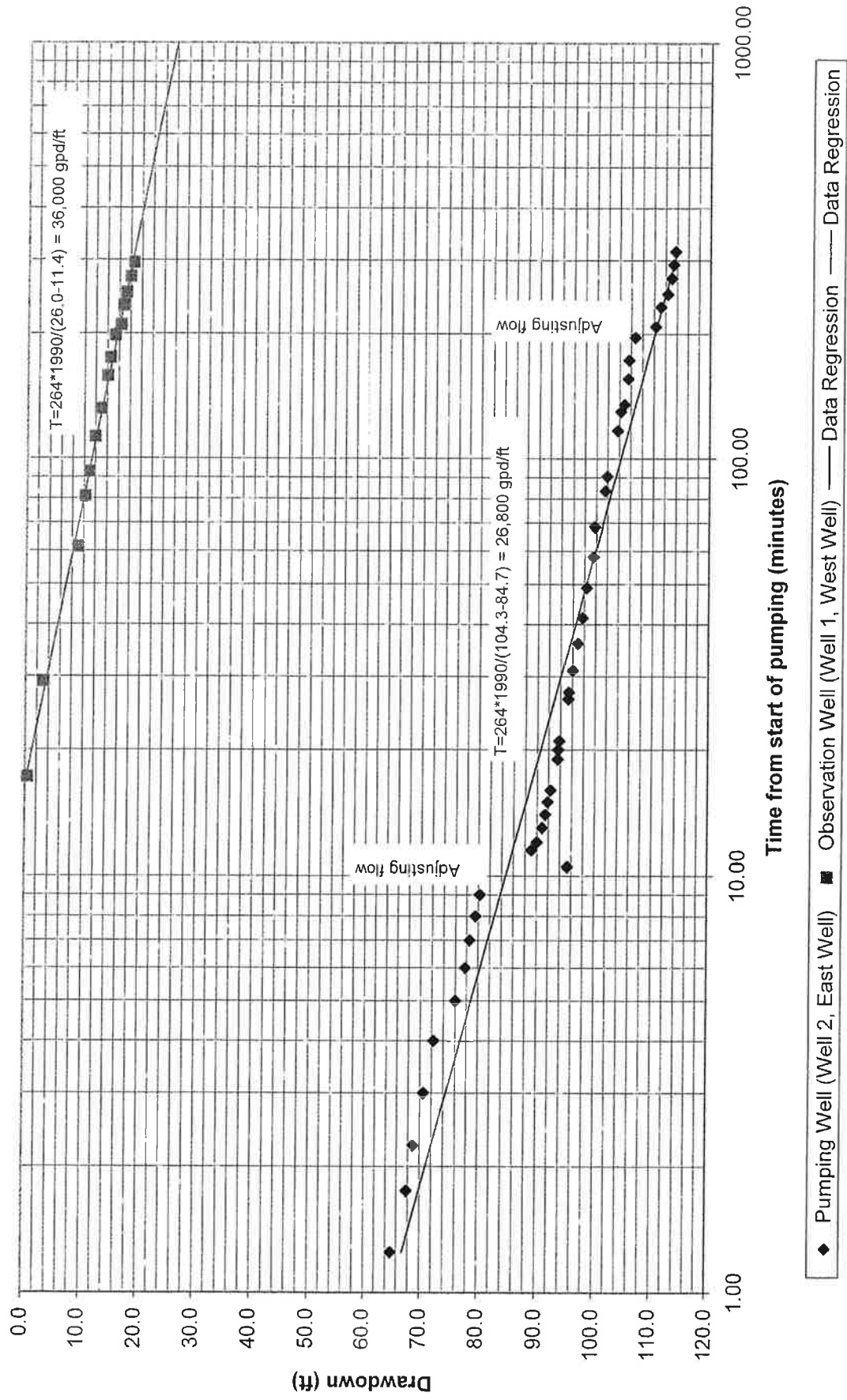
| Date | Time | Elapsed Time from Pump Start (min) | Elapsed Time from Pump Stop (min) | t/t    | Well 2 (East Well Readings) |                           |                        |                 |                            | Well 1 (West Well Readings) |                           |                        |                 |                              | Flow Measurements |                                                                                                                                | Comments |
|------|------|------------------------------------|-----------------------------------|--------|-----------------------------|---------------------------|------------------------|-----------------|----------------------------|-----------------------------|---------------------------|------------------------|-----------------|------------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------|----------|
|      |      |                                    |                                   |        | Pressure Gage Reading (psi) | Depth to Water (feet BWP) | Water Level (feet BGS) | Drawdown (feet) | Specific Capacity (gpm/ft) | Pressure Gage Reading (psi) | Depth to Water (feet BWP) | Water Level (feet BGS) | Drawdown (feet) | Orifice Measurement (inches) | Flow Rate (gpm)   |                                                                                                                                |          |
|      |      | 36.00                              |                                   |        |                             | 77.3                      | 74.8                   | 96.9            | 21                         |                             |                           |                        |                 |                              |                   | Well 1 < 1psi (gage has pegged)                                                                                                |          |
|      |      | 38.00                              |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 41.50                              |                                   |        |                             | 78.1                      | 75.6                   | 97.7            | 20                         |                             |                           |                        |                 |                              |                   | Opened valve on Well 1; water level still above invert, closed valve                                                           |          |
|      |      | 45.00                              |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 49.00                              |                                   |        |                             | 78.8                      | 76.3                   | 98.4            | 20                         |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 58.00                              |                                   |        |                             | 80.0                      | 77.5                   | 99.6            | 20                         |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 61.50                              |                                   |        |                             |                           |                        |                 |                            |                             | 3.0                       | 1.3                    | 9.10            |                              |                   |                                                                                                                                |          |
|      |      | 68.50                              |                                   |        |                             | 80.1                      | 77.6                   | 99.7            | 20                         |                             |                           |                        |                 | 44                           | 1989              |                                                                                                                                |          |
|      |      | 74.00                              |                                   |        |                             |                           |                        |                 |                            |                             | 4.2                       | 2.5                    | 10.30           |                              |                   |                                                                                                                                |          |
|      |      | 81.00                              |                                   |        |                             | 82.0                      | 79.5                   | 101.6           | 20                         |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 83.50                              |                                   |        |                             | 82.3                      | 79.8                   | 101.9           | 20                         |                             | 4.9                       | 3.2                    | 11.00           |                              |                   |                                                                                                                                |          |
|      |      | 90.50                              |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 | 44                           | 1989              |                                                                                                                                |          |
|      |      | 93.00                              |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 96.00                              |                                   |        |                             |                           |                        |                 |                            |                             | 5.9                       | 4.2                    | 12.00           |                              |                   |                                                                                                                                |          |
|      |      | 113.00                             |                                   |        |                             | 84.1                      | 81.6                   | 103.7           | 19                         |                             |                           |                        |                 |                              |                   | Specific conductance 129.8 uS; temperature 11.2 deg C                                                                          |          |
|      |      | 117.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 125.00                             |                                   |        |                             | 84.6                      | 82.1                   | 104.2           | 19                         |                             | 6.8                       | 5.1                    | 12.90           |                              |                   |                                                                                                                                |          |
|      |      | 130.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 132.00                             |                                   |        |                             | 85.3                      | 82.8                   | 104.9           | 19                         |                             |                           |                        |                 | 44                           | 1989              |                                                                                                                                |          |
|      |      | 135.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 137.00                             |                                   |        |                             | 85.9                      | 83.4                   | 105.5           | 19                         |                             | 8.0                       | 6.3                    | 14.10           |                              |                   |                                                                                                                                |          |
|      |      | 156.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 158.00                             |                                   |        |                             | 86.05                     | 83.6                   | 105.7           | 19                         |                             | 8.5                       | 6.8                    | 14.60           |                              |                   |                                                                                                                                |          |
|      |      | 175.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Started Rossum sand test                                                                                                       |          |
|      |      | 180.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Checked flow rate on Rossum sand test; SL in 2'18" = 0.57 gpm; at this rate 0.011 mL/min = 5 ppm sand                          |          |
|      |      | 185.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Ended Rossum sand test; sand was not measurable, a tiny trace was visible at bottom of vial, <<< 0.1 mL/10 min, <<<0.01 mL/min |          |
|      |      | 190.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Removed Rossum apparatus and collected sample for laboratory analysis of sand content                                          |          |
|      |      | 192.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 196.00                             |                                   |        |                             | 87.1                      | 84.6                   | 106.7           | 19                         |                             | 9.3                       | 7.6                    | 15.40           | 43                           | 1987              |                                                                                                                                |          |
|      |      | 198.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 200.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 203.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 205.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Specific conductance 130.2 uS; temperature 11.2 deg C                                                                          |          |
|      |      | 208.00                             |                                   |        |                             | 90.7                      | 88.2                   | 110.3           | 18                         |                             |                           |                        |                 |                              |                   | Adjusted rpm to increase flow                                                                                                  |          |
|      |      | 210.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 214.00                             |                                   |        |                             | 91.6                      | 89.1                   | 111.2           | 18                         |                             | 10.25                     | 8.6                    | 16.35           | 45                           | 2012              |                                                                                                                                |          |
|      |      | 232.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 234.00                             |                                   |        |                             | 92.8                      | 90.3                   | 112.4           | 18                         |                             | 10.7                      | 9.0                    | 16.80           |                              |                   |                                                                                                                                |          |
|      |      | 249.00                             |                                   |        |                             |                           |                        |                 |                            |                             | 11.2                      | 9.5                    | 17.30           |                              |                   |                                                                                                                                |          |
|      |      | 251.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 | 45                           |                   |                                                                                                                                |          |
|      |      | 255.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 272.00                             |                                   |        |                             | 93.5                      | 91.0                   | 113.1           | 18                         |                             | 11.9                      | 10.2                   | 18.00           |                              |                   |                                                                                                                                |          |
|      |      | 274.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 293.00                             |                                   |        |                             | 93.8                      | 91.3                   | 113.4           | 18                         |                             | 12.5                      | 10.8                   | 18.60           |                              |                   | Specific conductance 134.2 uS; temperature 11.3 deg C                                                                          |          |
|      |      | 296.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 | 44                           |                   |                                                                                                                                |          |
|      |      | 299.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 305.00                             |                                   |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   | Shut off pump because of sediment control concerns at designated discharge area                                                |          |
|      |      | 315.00                             |                                   |        |                             | 94.1                      | 91.6                   | 113.7           | 18                         |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 316.00                             | 0.00                              |        |                             |                           |                        |                 |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 317.00                             | 1.00                              | 317.00 |                             | 25.8                      | 23.3                   | 45.4            |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |
|      |      | 318.00                             | 2.00                              | 159.00 |                             | 21.5                      | 19.0                   | 41.1            |                            |                             |                           |                        |                 |                              |                   |                                                                                                                                |          |



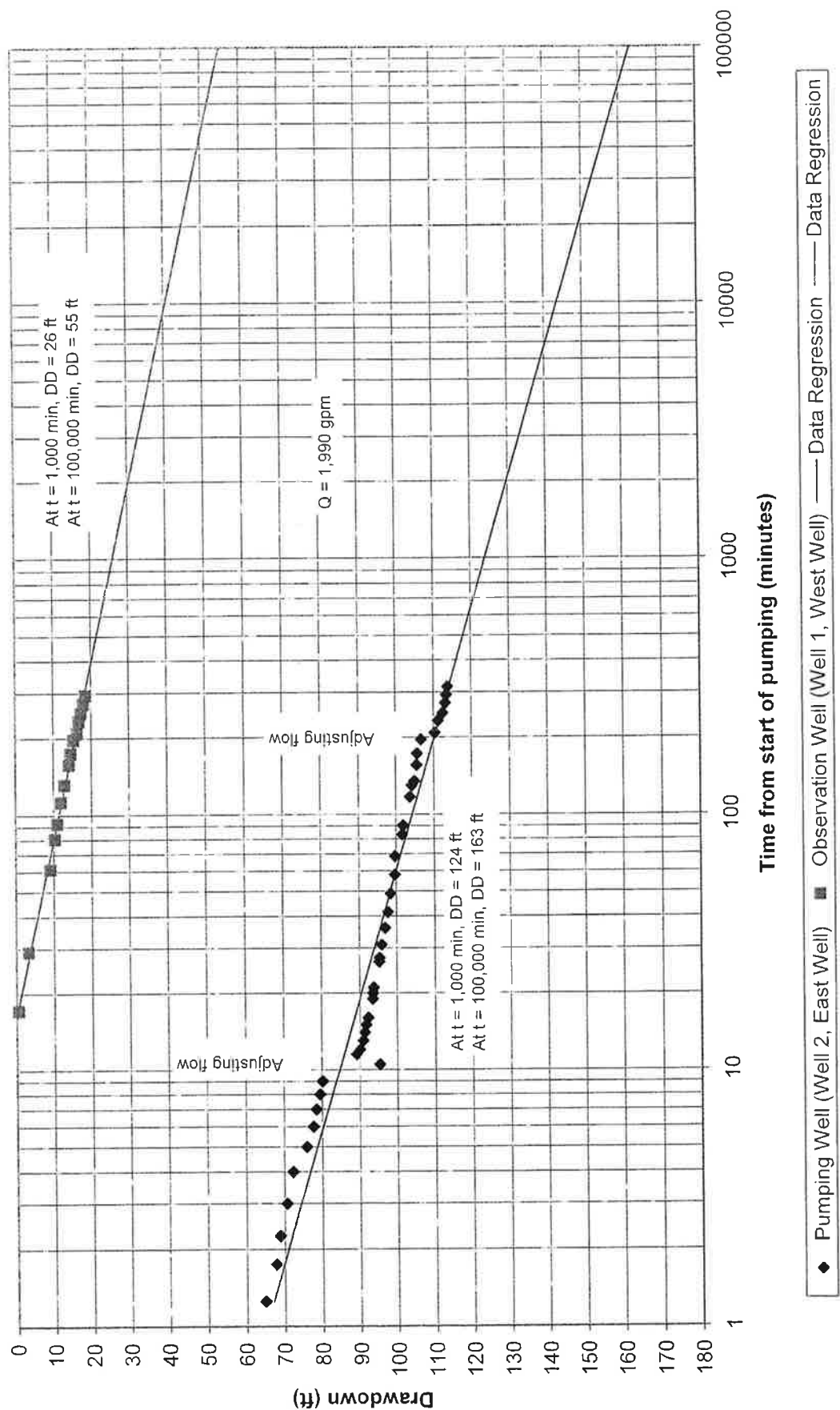
Blackhawk on the River, Well 2 Pump Test  
East Well, September 17, 2005



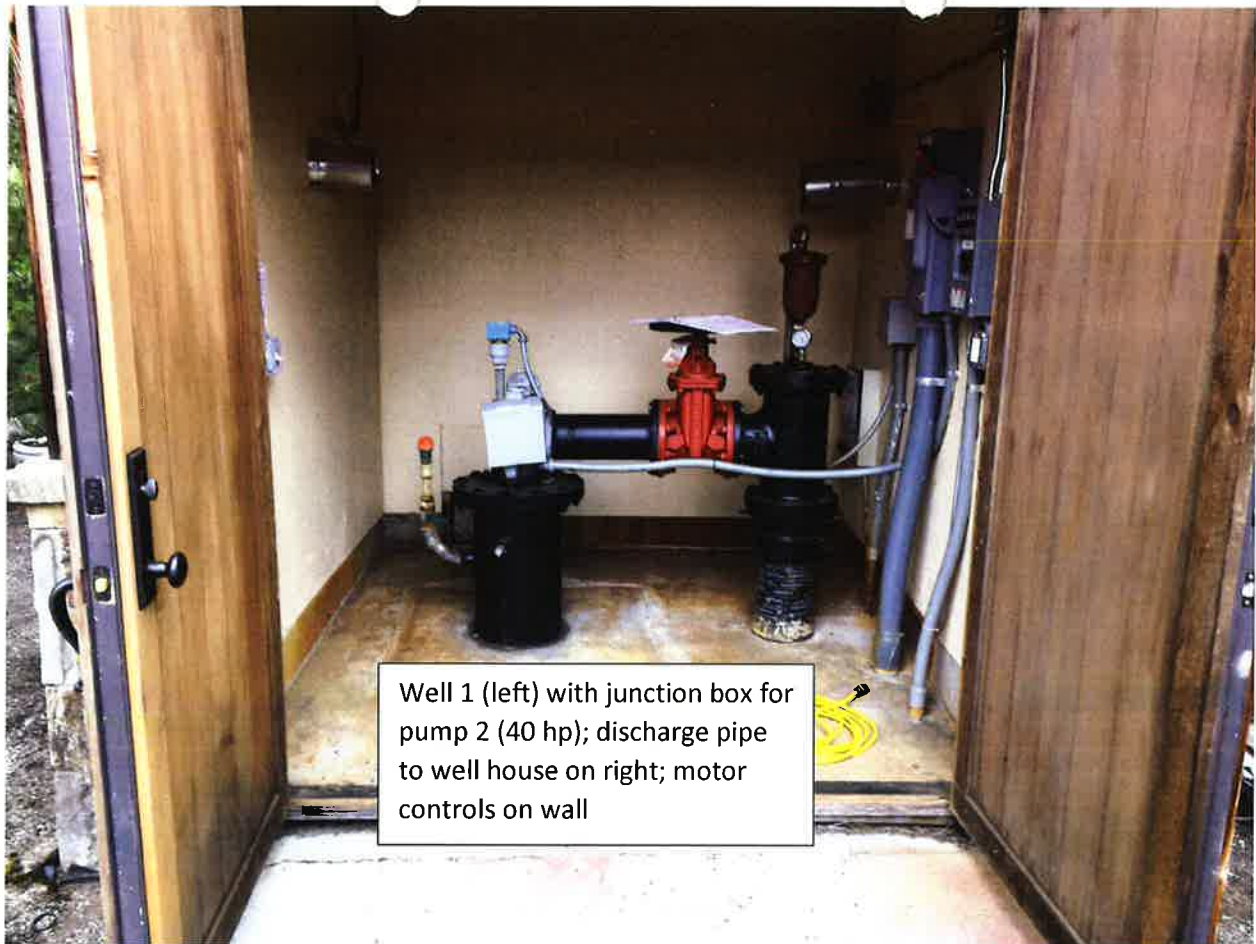
# Blackhawk on the River, Well 2 Pump Test East Well, September 17, 2005



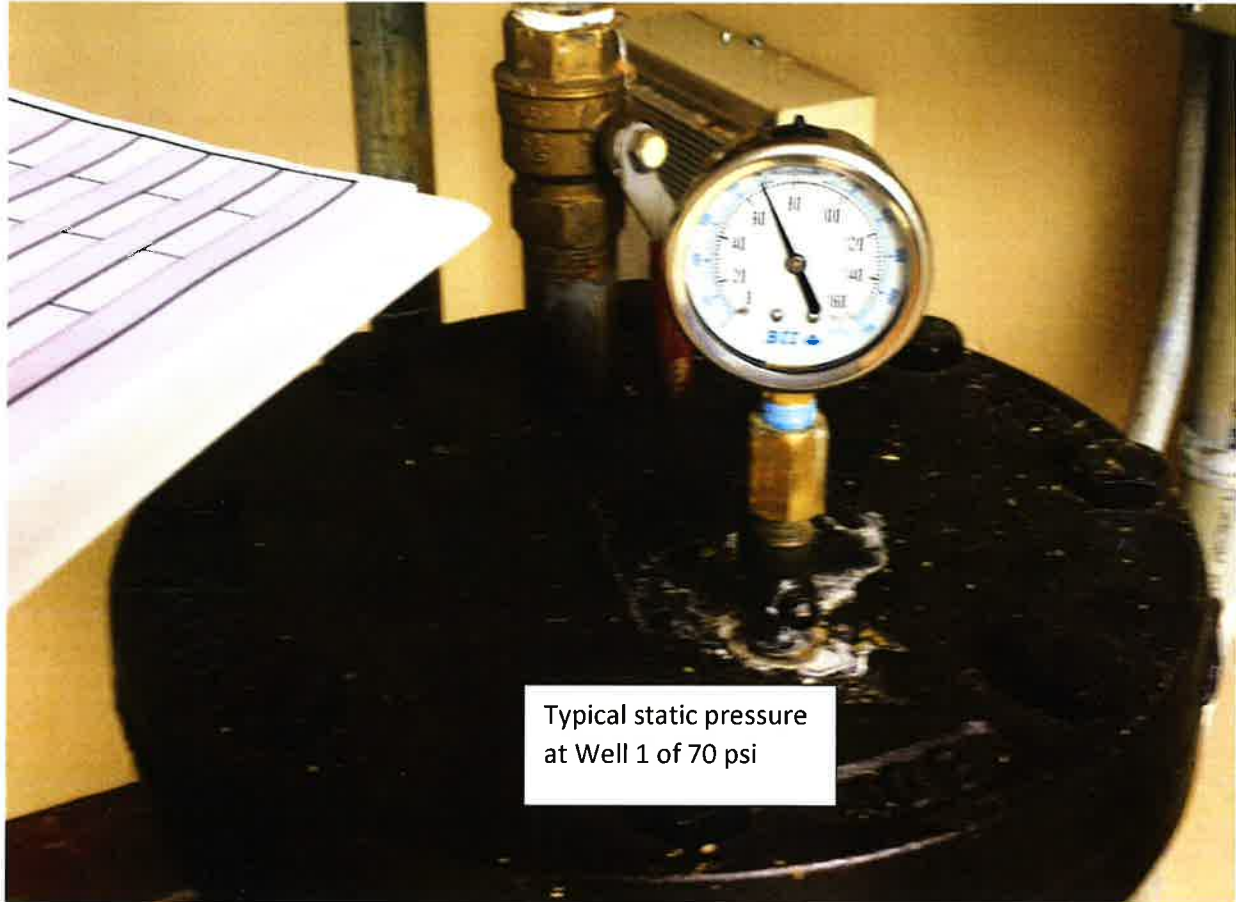
# Blackhawk on the River, Well 2 Pump Test East Well, September 17, 2005



**Attachment C**  
**Field Exam Photos**



Well 1 (left) with junction box for pump 2 (40 hp); discharge pipe to well house on right; motor controls on wall



Typical static pressure at Well 1 of 70 psi



Well 2 with junction box and discharge pipe for pump 1 (15 hp) in foreground and left; discharge pipe and junction box for pump 3 (100 hp) in back



Well house mechanical piping.  
See drawings for explanation.



Well house mechanical piping.  
See drawings for explanation.



Well 2 with junction box and discharge pipe for  
pump 3 (100 hp) in foreground and right; discharge  
pipe for pump 1 (15 hp) in back



Well house mechanical piping.  
See drawings for explanation.



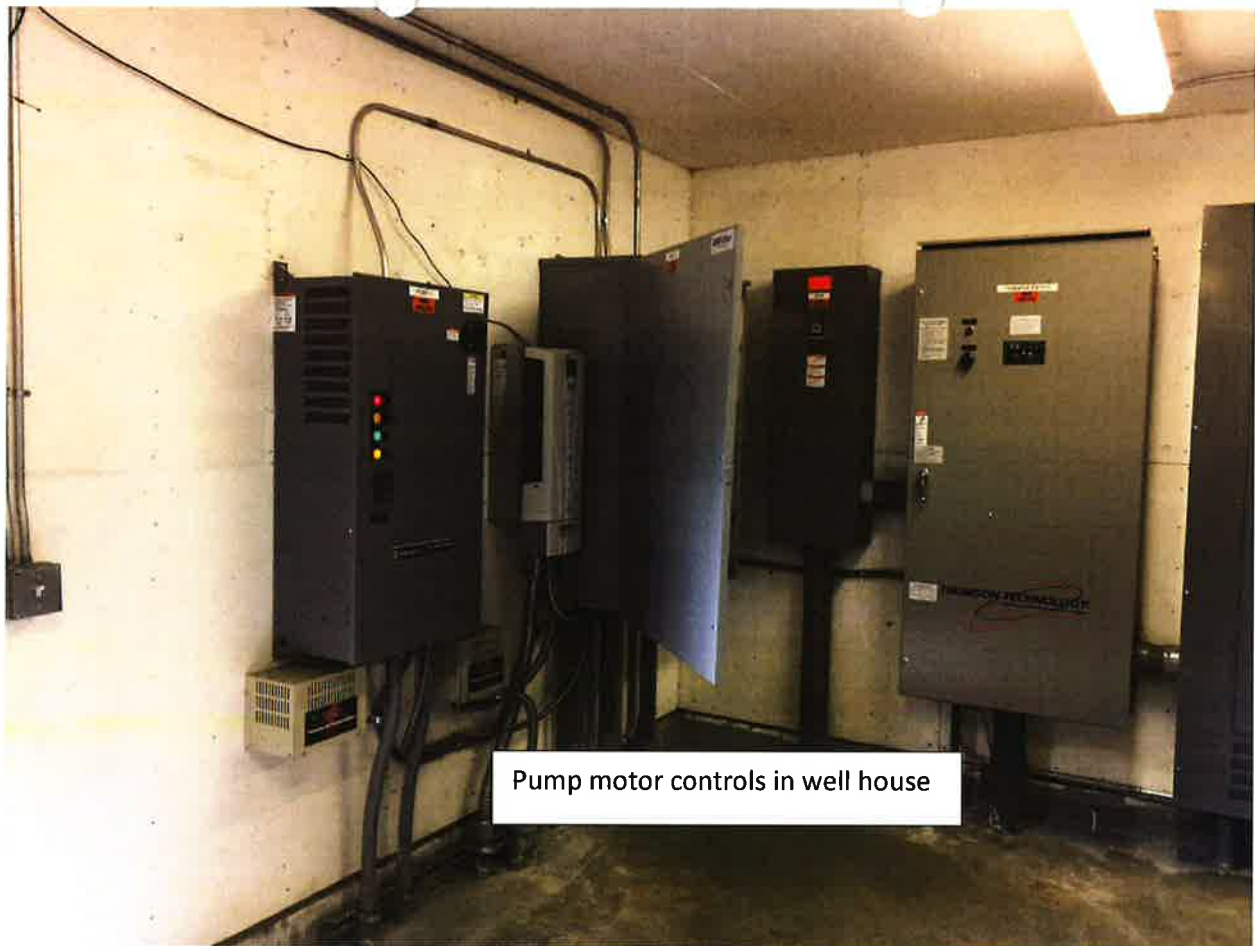
4-inch flow meter



4-inch flow meter display during testing of pumps 1 and 2; 851 gpm, 42 psi on pressure gage



Pump motor controls in well house



Pump motor controls in well house



Pump 1 (15 hp) vfd panel

Pump 3 (100 hp) panel and pump system PLC on left,  
automatic transfer switch for backup generator on right





Well house building at Well 2



Backup generator (right) and  
transformer (left)



Irrigated landscaping at lodge



Irrigated landscaping at lodge



Typical water meter  
box at undeveloped lot



Fire hydrants within  
water system