# Overview of East Ada Hydrologic Study

Craig Tesch

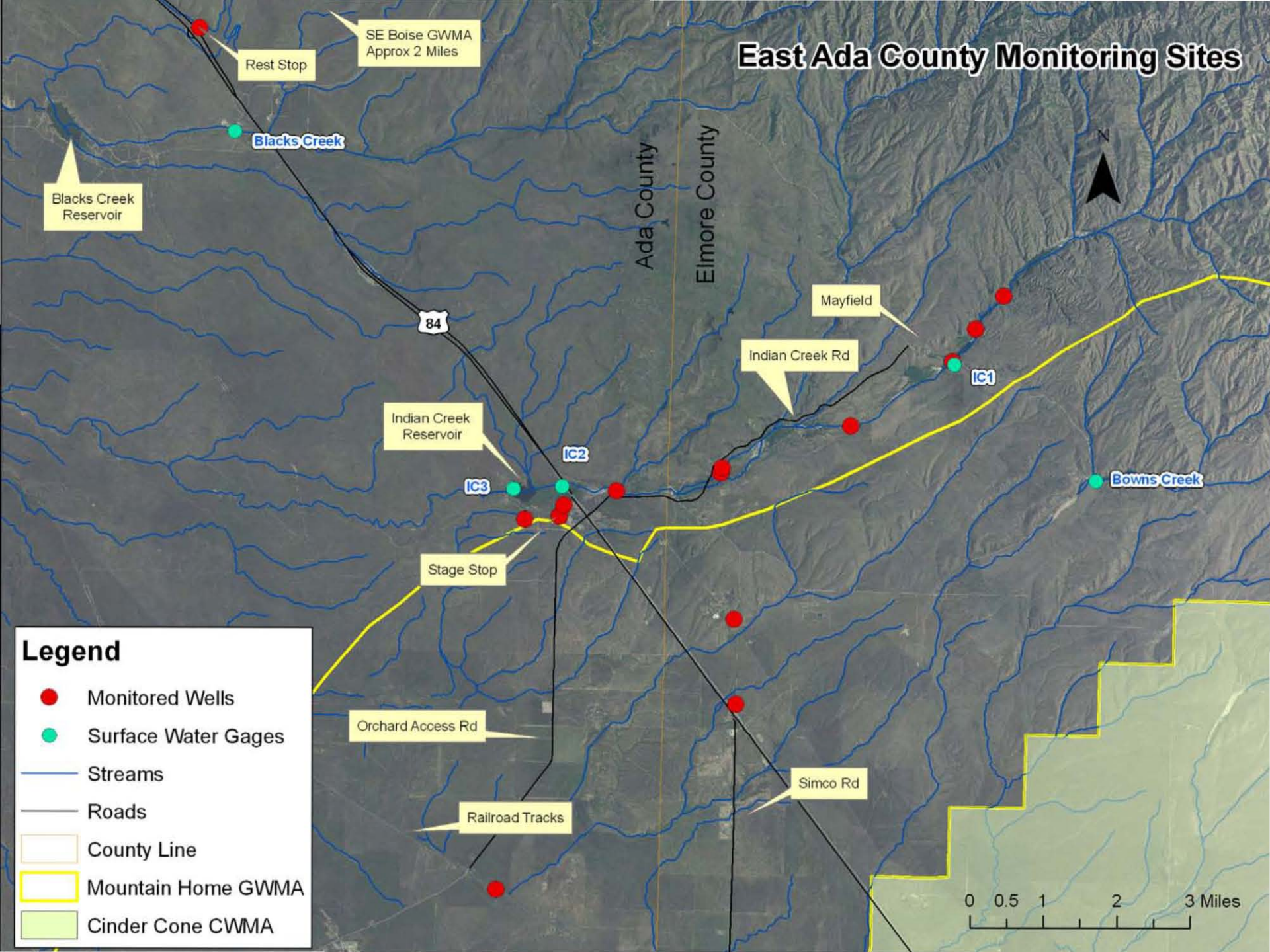
August , 2010

# East Ada Overview

- Technical component of the Treasure Valley CAMP
- Provide data to assist in the management of Treasure Valley aquifers over the next 50 years
- Groundwater and surface water studies conducted by IDWR and through contracts

# East Ada Overview

- Project area is between the Southeast Boise GWMA and the Mountain Home GWMA
- Largely undeveloped and data limited
- Potential for multiple sedimentary and basalt aquifers
- Surface water hydrology is limited due to the arid climate and permeable stream channels


East Ada County Monitoring Sites
Rest Stop
SE Boise GWMA
Approx 2 Miles
Blacks Creek
Blacks Creek
Reservoir
Ada County
Elmore County
N
84
Mayfield
Indian Creek Rd
IC1
Indian Creek
Reservoir
IC2
IC3
Bowns Creek
Stage Stop
Orchard Access Rd
Simco Rd
Railroad Tracks
Legend
Monitored Wells
Surface Water Gages
Streams
Roads
County Line
Mountain Home GWMA
Cinder Cone CWMA
0 0.5 1 2 3 Miles

# East Ada Wells

- Currently monitoring 14 groundwater wells, 9 with data loggers (readings every 6 hours)

- General static water levels:
  - Shallow: < 100 ft
  - Moderate:  300-500 ft
  - Deep:  > 600 ft

- Typically completed in sediments or basalt

IDAHO Department of Water Resources

Stage Stop Deep

Other IDWR No. D0039002

**2. OWNER:**

Name Boise Stage Stop

Address 23801 S Orchard Access RD.

City Boise State ID Zip 83716

**3. LOCATION OF WELL by legal description:**

Sketch map location must agree with written location

N

W E

S

Twp. 1 North ☒ or South ☐

Rge. 4 East ☒ or West ☐

Sec. 32 1/4 (10 acres) NW 1/4 (40 acres) NE 1/4 (160 acres)

Gov't lot _____ County Ada

Lat: : : Long: : :

Address of Well Site I 84 & exit 71

City Boise

(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

**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 _____

**7. SEALING PROCEDURES**

| SEAL/FILTER PACK | | | AMOUNT | METHOD |
|---|---|---|---|---|
| Material | From | To | Sacks or Pounds | |
| bentonite | 0 | 60 | 5000 pds | overbore |
| | | | | |
| | | | | |

**11. WELL TESTS:**

☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

| Yield gal/min. | Drawdown | Pumping Level | Time |
|---|---|---|---|
| 20 | | | |
| | | | |
| | | | |

Water Temp. _____ Bottom hole temp. _____

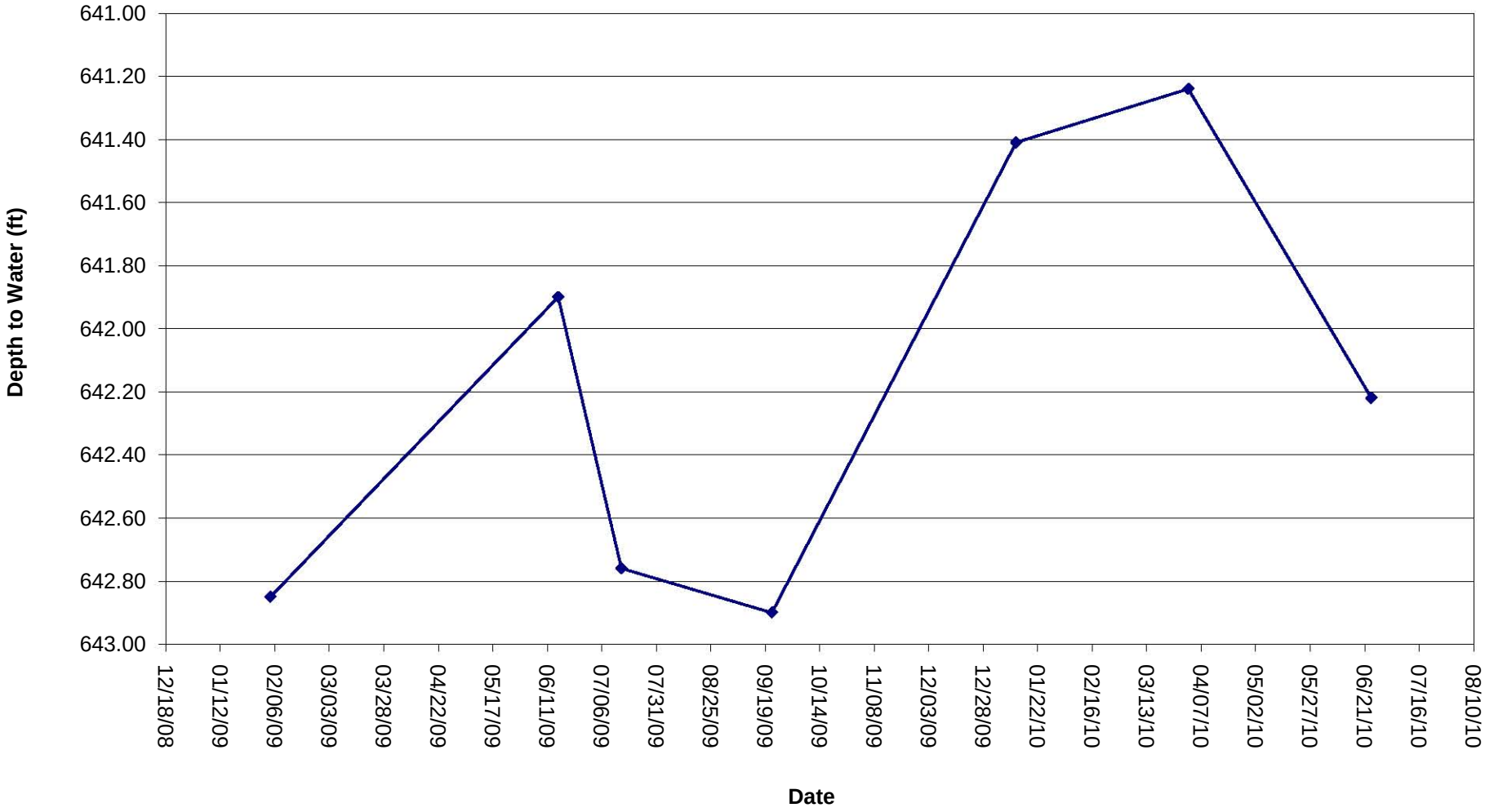
Water Quality test or comments: _____

Depth first Water Encountered _____

**12. LITHOLOGIC LOG: (Describe repair or abandonment)**

| Bore Dia | From | To | Remarks:Lithology, Water Quality & Temp. | Water Y | Water N |
|---|---|---|---|---|---|
| 12 | 0 | 4 | topsoil | | ☒ |
| 12 | 4 | 26 | sand brown | | ☒ |
| 12 | 26 | 60 | clay | | ☒ |
| 8 | 60 | 250 | tan sand | | ☒ |
| 8 | 250 | 300 | tan clay | | ☒ |
| 8 | 300 | 348 | tan sand | | ☒ |
| 8 | 348 | 375 | tan clay | | ☒ |
| 8 | 375 | 438 | tan sand | | ☒ |
| 8 | 438 | 500 | tan clay | | ☒ |
| 6 | 500 | 546 | tan sand | | ☒ |
| 6 | 546 | 580 | tan clay | | ☒ |
| 6 | 580 | 623 | blue clay | | ☒ |
| 6 | 623 | 651 | tan sand | | ☒ |
| 6 | 651 | 720 | blue clay | | ☒ |
| 6 | 720 | 800 | tan sand | | ☒ |
| 6 | 800 | 850 | tan clay | | ☒ |
| 6 | 850 | 880 | fine tan sand | ☒ | |
| 6 | 880 | 884 | coarse black & white sand | | ☒ |
| | | | | | |
| | | | | | |
| | | | | | |

# East Ada Well Hydrograph - Stage Stop Deep



IDAHO Department of Water Resources

Rest Stop

Water Right or Injection Well No. 63-12579

**2. OWNER:**

Name Idaho State Transportation Dept

Address PO Box 7129

City Boise State ID Zip 83707

**3. LOCATION OF WELL by legal description:**

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

Twp. 2 North XX or South ☐

Rge. 3 East XX or West ☐

Sec. 28, N/E 1/4 (10 acres) N/E 1/4 (10 acres) S/W 1/4 (10 acres)

Gov't Lot County Ada

Lat: 43: 28': 45.78" Long: 116 :6' : 17.64"

Address of Well Site 1.5 miles NW of exit 64 on westbound I-84 City Boise

(Give at least name of road + Distance to Road or Landmark)

Lt. Blk. Sub. Name Black's Creek Rest Area

**4. USE:**

XX☑ Domestic ☐ Municipal ☐ Monitor XX☑ Irrigation

☐ Thermal ☐ Injection ☐ Other

**5. TYPE OF WORK** check all that apply (Replacement etc.)

XX☑ 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 |
|---|---|---|---|---|
| bentonite chips | 0 | 203 | 7 cu yd | poured |
| cement | 203 | 685 | 11 cu yd | pumped |

Was drive shoe used? ☐ Y X☑ N Shoe Depth(s)

Was drive shoe seal tested? ☐ Y X☑ N How?

**8. CASING/LINER:**

| Diameter | From | To | Gauge | Material | Casing | Liner | Welded | Threaded |
|---|---|---|---|---|---|---|---|---|
| 10 | ~~+2~~ | 55 | 365 | steel | XX☑ | ☐ | XX☑ | ☐ |

**12. WELL PERFORMANCE** Lat: Long:

XX☑ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

| Yield gal./min. | Drawdown | Pumping Level | Time |
|---|---|---|---|
| 106 | 20.5 | 689.5 | 24 hrs |
| | | | |

Water Temp. Bottom hole temp.

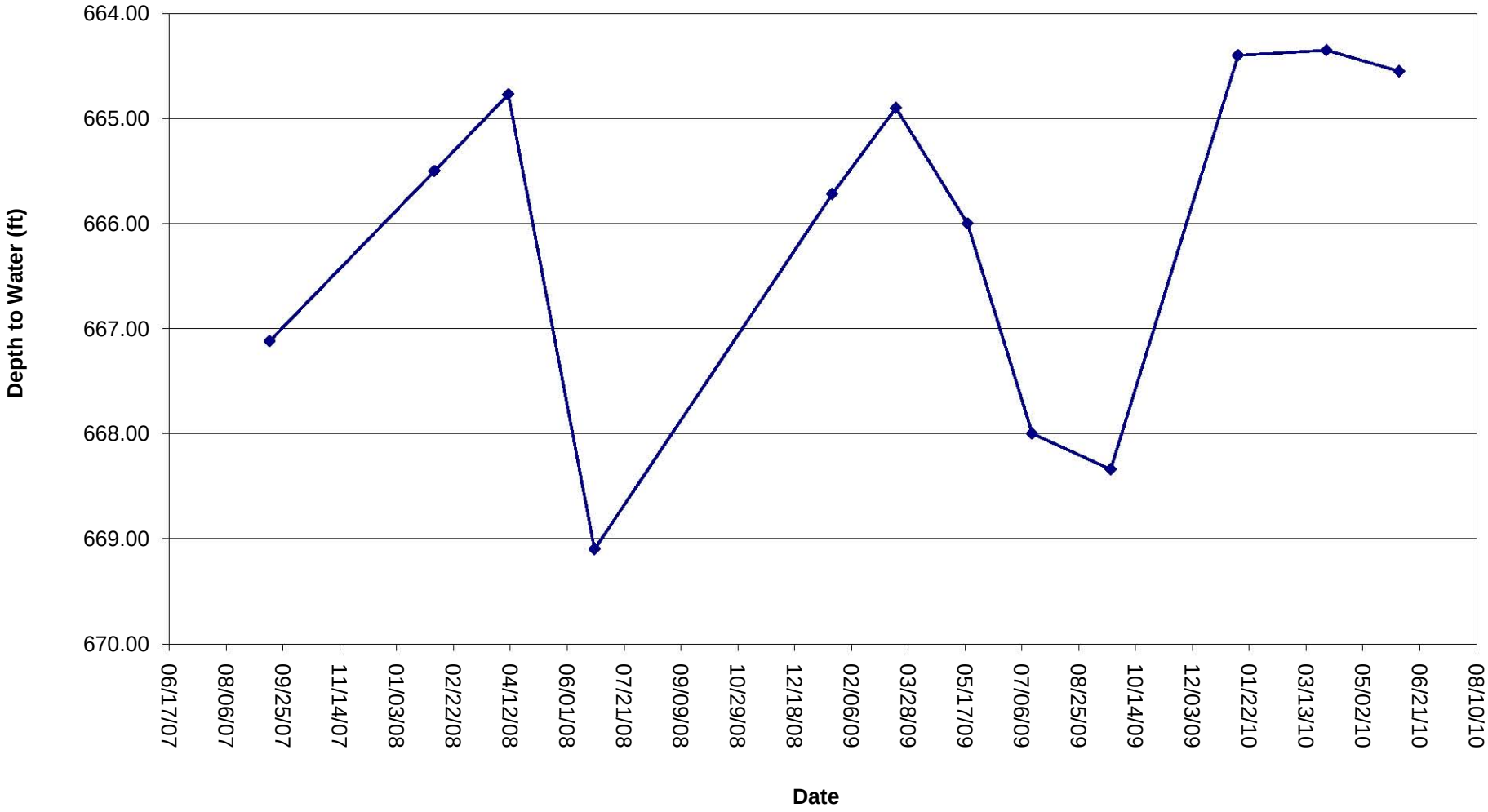
Water Quality test or comments:

Depth first Water Encounter

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

| Bore Dia. | From | To | Remarks: Lithology, Water Quality & Temperature | Water Y | Water N |
|---|---|---|---|---|---|
| 15 | 0 | 1 | tposoil | | X |
| | 1 | 103 | cemented sand, gravel & boulders | | X |
| | 103 | 125 | cemented sand & gravel | | X |
| | 125 | 180 | cemented sand, gravel & boulders | | X |
| 13.5 | 180 | 208 | cemented sand & gravel | | X |
| | 208 | 213 | clay | | X |
| | 213 | 235 | cemented sand & gravel | | X |
| | 235 | 265 | cemented sand, gravel, boulders | | X |
| | 265 | 320 | cemented sand, smaller gravel | | X |
| | 320 | 382 | cemented sand, gravel | | X |
| | 382 | 392 | clay | | X |
| | 392 | 410 | cemented gravel & boulders | | X |
| | 410 | 590 | cemented sand, gravel, clay | | X |
| | 590 | 610 | sand, gravel, boulders | | X |
| | 610 | 650 | cemented sand & gravel | | X |
| | 650 | 680 | clay | | X |
| | 680 | 792 | cemented sand & clay streaks | X | |
| | 792 | 830 | sand & small gravel | X | |
| | 830 | 845 | clay | | X |
| | 845 | 940 | sand & small gravel | X | |
| | 940 | 990 | cemented sand, gravel & clay | X | |
| | 990 | 1010 | boulder or granite, very hard | | X |

# East Ada Well Hydrograph - Rest Stop



USGS-1

Owner U P R R AT ORCHARD No. 1S 4E-30aacd

Location NE ¼ NE ¼ sec. 30, T. 1 S, R. 4E

Well is 77' left of center of main track

Driller Penn Drilling Const. Co. Address

Source of data log from UPRR Record by HGS

(1/31/50 LSD)

| | Thickness | Depth |
|---|---|---|
| Hardpan | 35 | 0-35 |
| Yellow Clay | 10 | 35-45 |
| Shale & Clay | 42 | 45-87 |
| Grey Lava | 12 | 87-109 |
| Sandstone | 71 | 109-180 |
| Lava, Crevice at 197 | 120 | 180-300 |
| Grey Lava Hard | 30 | 300-330 |
| Cinder Lava | 25 | 330-355 |
| Lava, Red Hard | 9 | 355-364 |
| Lava, Grey Hard | 12 | 364-376 |
| Lava, Hard | 49 | 376-425 |
| Lava dark hard | 18 | 425-443 |

Completed May 20, 1961 County ADA

Owner U P R R AT ORCHARD No. 1S 4E-30aacd

Location NE ¼ NE ¼ sec. 30, T. 1 S, R. 4E

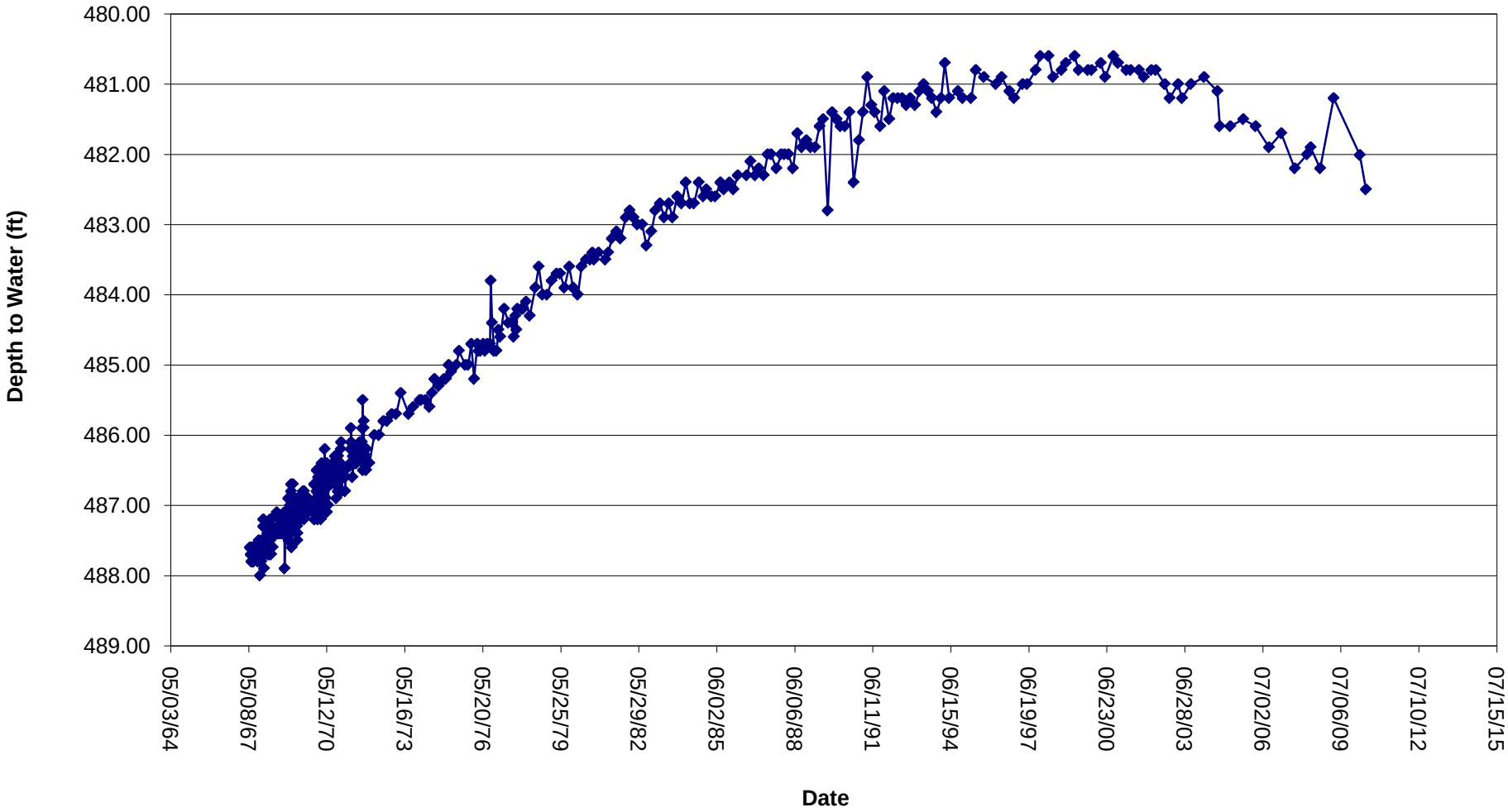
Well is 77' left of center of main track

Driller Penn Drilling Const. Co. Address

Source of data log from UPRR Record by HGS

| | Thickness | Depth |
|---|---|---|
| Lava Red | 67 | 443-510 |
| Sand & Gravel some water @515 | 40 | 510-550 |
| The following part of log was obtained from Mr. Muenchmeyer who obtained it from the R.R. | | |
| Sand & Gravel some water @515 | | 510-570 |
| Sand fine, caved badly | 23 | 570-593 |
| Clay | 22 | 593-615 |
| Lava stress water at 650' | 50 | 615-665 |
| Sand fine | | 665-750 |
| water stands in well at 535' from surface | | |
| well tested & supplies 144,000 gal in 24 hrs. | | |

# East Ada Well Hydrograph - USGS-1



IDAHO Department of Water Resources

Agenbroad

☐ Domestic ☒ Irrigation ☐ Test ☐ Municipal
☐ Industrial ☐ Stock ☐ Waste Disposal or Injection
☐ Other _____ (specify type)

**4. METHOD DRILLED**

☐ Rotary ☐ Air ☐ Hydraulic ☒ Reverse rotary
☐ Cable ☐ Dug ☐ Other _____

**5. WELL CONSTRUCTION**

Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____

| Thickness | Diameter | From | To |
|---|---|---|---|
| .250 inches | 16 inches + | 2 feet | 500 feet |
| .250 inches | 16 inches | 510 feet | 608 feet |
| .250 inches | 16 inches | 688 feet | 712 feet |
| .250 inches | 16 inches | 752 feet | 763 feet |
| .281 inches | 26 inches | 0 feet | 72 feet |

Was casing drive shoe used? ☐ Yes ☒ No
Was a packer or seal used? ☐ Yes ☒ No
Perforated? ☐ Yes ☒ No
How perforated? ☐ Factory ☐ Knife ☐ Torch
Size of perforation _____ inches by _____ inches

| Number | From | To |
|---|---|---|
| _____ perforations | _____ feet | _____ feet |
| _____ perforations | _____ feet | _____ feet |
| _____ perforations | _____ feet | _____ feet |

Well screen installed? ☒ Yes ☐ No
Manufacturer's name Roscoe Moss
Type _____ Model No. _____
Diameter 16 Slot size 80 Set from 500 feet to 510 feet
Diameter 16 Slot size 80 Set from 608 feet to 688 feet
Diameter 16 Slot size 80 Set from 712 feet to 752 feet
Gravel packed? ☒ Yes ☐ No ☐ Size of gravel 3/8 minus
Placed from 6 feet to 763 feet
Surface seal depth 72 Material used in seal: ☒ Cement grout ☐ Puddling clay ☐ Well cuttings
Sealing procedure used: ☐ Slurry pit ☐ Temp. surface casing ☒ Overbore to seal depth
Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld
☐ Cemented between strata
Describe access port To be determined

**9. LITHOLOGIC LOG** 106C20

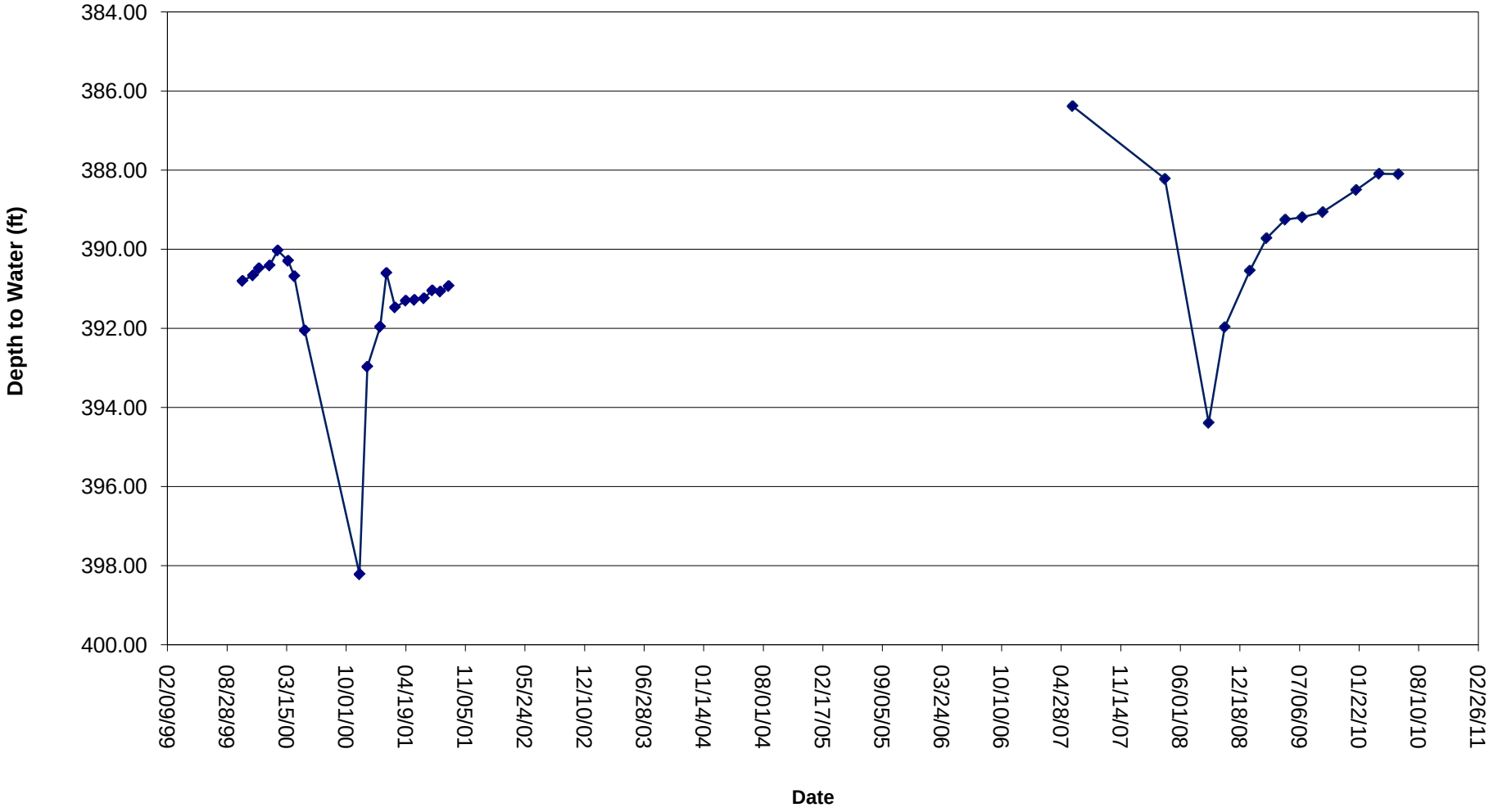
| Hole Diam. | Depth From | Depth To | Material | Water Yes | Water No |
|---|---|---|---|---|---|
| 28 | 0 | 6 | Topsoil & Clay | | |
| | 6 | 25 | Sand - Crsse. & Sharp | | |
| | 25 | 67 | Brn. Sand - Crse w/some Clay | | |
| | 67 | 74 | Siltstone & Cinders | | |
| 24 | 74 | 78 | Siltstone & Cinders | | |
| | 78 | 98 | Brn. Clay w/some Sand & Gravel | | |
| | 98 | 208 | Brn. Clay w/Sand Streaks | | |
| | 208 | 224 | Brn. Clay | | |
| | 224 | 268 | Brn. Clay w/some Brn. Sand | | |
| | 268 | 272 | Cemented Gravel | | |
| | 272 | 278 | Sand & Gravel | | |
| 18 | 278 | 286 | Brn. Clay w/some Sand & Gravel | | |
| | 286 | 311 | Brn. Sand w/Gravel Streaks | | |
| | 311 | 384 | Brn. Clay w/traces of Sand | | |
| | 384 | 390 | Brn. Clay | | |
| | 390 | 396 | Brn. Sand w/some Clay Streaks | | |
| | 396 | 444 | Brn. Clay | | |
| | 444 | 466 | Sand & Sm. Gravel w/some Clay | | |
| | 466 | 494 | Sand & Clay | | |
| | 494 | 500 | Blue Clay | | |
| | 500 | 509 | Blue Sand w/some Gravel | | |
| | 509 | 513 | Blue Clay w/Sand & Gravel streaks | | |
| | 513 | 530 | Brn. Clay w/some Sand | | |
| | 530 | 574 | Clay w/traces of Sand | | |
| | 574 | 596 | White Clay w/traces of Sand | | |
| | 596 | 607 | White & Blue Clay w/some Sand | | |
| | 607 | 621 | Blue Clay w/some Sand | | |
| | 621 | 653 | Blue Sand w/some Clay Streaks | | |
| | 653 | 660 | Blue Clay | | |
| | 660 | 700 | Blue Sand | | |
| | 700 | 736 | Blue Clay | | |
| | 736 | 740 | Green Clay w/Sand Streaks | | |
| | 740 | 744 | Blue Clay w/traces of Sand | | |
| | 744 | 752 | Green & Blue Sand | | |
| | 752 | 763 | Blue Sand w/some Clay & Granite | | |

**10.** Work started 8-2-79 Finished 9-4-79

RECEIVED

RECEIVED

# East Ada Well Hydrograph - Agenbroad



IDAHO Department of Water Resources

Underwood Shallow

Name JIM UNDERWOOD
Address HC 34 MAYFIELD STAGE
City BOISE State ID Zip 83706

## 3. LOCATION OF WELL by legal description:

Sketch map location must agree with written location.

N / W / E / S

T. 1N North ☐ or South ☐
R. 4E East ☐ or West ☐
Sec 27 SW 1/4 NE 1/4 1/4
(10 acres) (40 acres) (160 acres)
Gov't Lot ____ County ELMORE

Address of Well Site HC 34 INDIAN CREEK RD HC 34
Mayfield Stage Stop
(Give at least Direction + Distance to Road or Landmark)

Lot No. ____ Block No. ____ Subd. Name ____

## 4. PROPOSED USE: DOMESTIC

☐ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other ____

## 5. TYPE OF WORK NEW WELL

☐ New Well ☐ Modify or Repair ☐ Replacement ☐ Abandonment

## 6. DRILL METHOD AIR ROTARY

☐ Mud Rotary ☐ Air Rotary ☐ Cable ☐ Other ____

## 7. SEALING PROCEDURES

| SEAL/FILTER PACK | | | AMOUNT | METHOD |
|---|---|---|---|---|
| Material | From | To | Sacks or Pounds | |
| #BENTONITE | 0 | 20 | 750# | POURED |
| | | | | |
| | | | | |
| | | | | |

Was drive shoe seal tested? Y☐ N☒ How? ____

## 8. CASING/LINER:

| Diameter | From | To | Guage | Casting | Liner | Steel | Plastic | Welded | Threaded |
|---|---|---|---|---|---|---|---|---|---|
| "8" | +1 | 68 | .250 | | | ☒ | ☐ | ☒ | ☐ |
| | | | | | | ☐ | ☐ | ☐ | ☐ |
| | | | | | | ☐ | ☐ | ☐ | ☐ |
| | | | | | | ☐ | ☐ | ☐ | ☐ |

Final location of shoes #68
Top Packer or Headpipe ____ Bottom Tailpipe ____

| | | | |
|---|---|---|---|
| 55 | 40 | 63 | 80 |
| | | | |

Temperature of water 65 Was a water analysis done? Yes ☐ No ☒
By whom? ____
Water Quality (odor, etc.) GOOD
Bottom Hole Temperature 65

## 11. STATIC WATER LEVEL:

15 L.F. ft. below surface Depth artesian flow found ____
Artesian pressure ____ lb. Describe access port WELL CAP
Describe Controlling Devices: ____

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

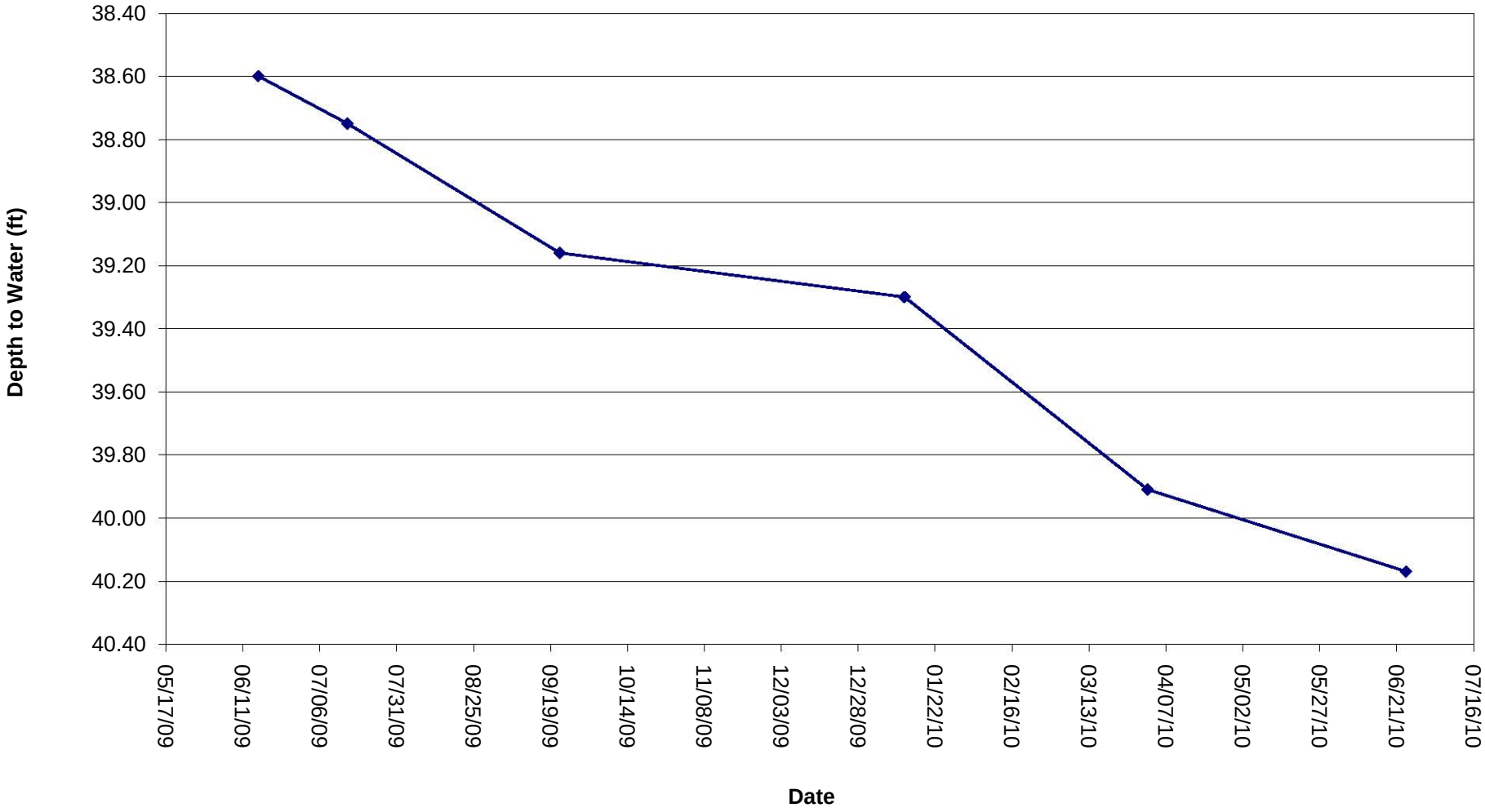
| Bore Dia. | From | To | Remarks: Lithology, Water Quality & Temperature | GPM | SWL |
|---|---|---|---|---|---|
| | 0 | 9 | TOPSOIL | | N |
| 10 | 9 | 20 | SAND | | Y |
| 8 | 20 | 23 | GRAVEL | | Y |
| | 23 | 27 | SAND | | Y |
| | 27 | 29 | CLAY | | N |
| | 29 | 48 | SAND | | Y |
| | 48 | 49 | BROWN CLAY | | N |
| | 49 | 58 | SAND | | Y |
| | 58 | 75 | BROWN CLAY | | N |
| | 75 | | SAND | | Y |

RECEIVED
OCT 20 1993
WATER RESOURCES
WESTERN REGION

INDEXED
FEB 28 1994

10/13/93 10/13/93

# East Ada Well Hydrograph - Underwood Shallow



IDAHO Department of Water Resources

Stage Stop Shallow

C

Form 238-7
3/95-C96

# IDAHO DEPARTMENT OF WATER RESOURCES
## WELL DRILLER'S REPORT 95988

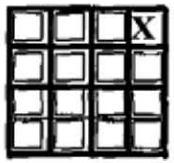
| Office Use Only |
|---|
| Inspected by _____ |
| Twp _____ Rge _____ Sec _____ |
| _____ 1/4 _____ 1/4 _____ 1/4 |
| Lat: : : Long: : : |

**1. DRILLING PERMIT NO.** 61-99-W-0024-000
Other IDWR No. D0009418

**2. OWNER:**
Name Boise Stage Stop
Address I-84 Exit 71
City Boise State ID Zip 83716

**3. LOCATION OF WELL by legal description:**
Sketch map location must agree with written location

N

W  E

S

Twp. 1 North X or South ☐
Rge. 4 East X or West ☐
Sec. 32 1/4 (10 acres) NE 1/4 (40 acres) NE 1/4 (160 acres)

Gov't lot _____ County Ada

Lat: : : Long: : :
Address of Well Site _____
City Boise
(Give at least name of road + Distance to Road or Landmark)

Lt. _____ Blk. _____ Sub. Name _____

**4. USE:**
X Domestic ☐ Municipal ☐ Monitor ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other _____

**5. TYPE OF WORK** check all that apply (Replacement etc.)
X New Well ☐ Modify ☐ Abandonment ☐ Other _____

**6. DRILL METHOD**
X Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other _____

**7. SEALING PROCEDURES**

| SEAL/FILTER PACK | | | AMOUNT | METHOD |
|---|---|---|---|---|
| Material | From | To | Sacks or | |

**11. WELL TESTS:**
☐ Pump ☐ Bailer X Air ☐ Flowing Artesian

| Yield gal/min. | Drawdown | Pumping Level | Time |
|---|---|---|---|
| 20+ | | | |
| | | | |
| | | | |

Water Temp. _____ Bottom hole temp. _____
Water Quality test or comments: _____
Depth first Water Encountered _____

**12. LITHOLOGIC LOG: (Describe repairs or abandonment)**

| Bore Dia | From | To | Remarks: Lithology, Water Quality & Temp. | Water Y | Water N |
|---|---|---|---|---|---|
| 12 | 0 | 2 | Top Soil | ☐ | X |
| 12 | 2 | 16 | Sand | ☐ | X |
| 12 | 16 | 22 | Tan Clay | ☐ | X |
| 8 | 22 | 54 | Decon Granite | ☐ | X |
| 8 | 54 | 65 | Gray Lava | ☐ | X |
| 8 | 65 | 66 | Gravels | X | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |
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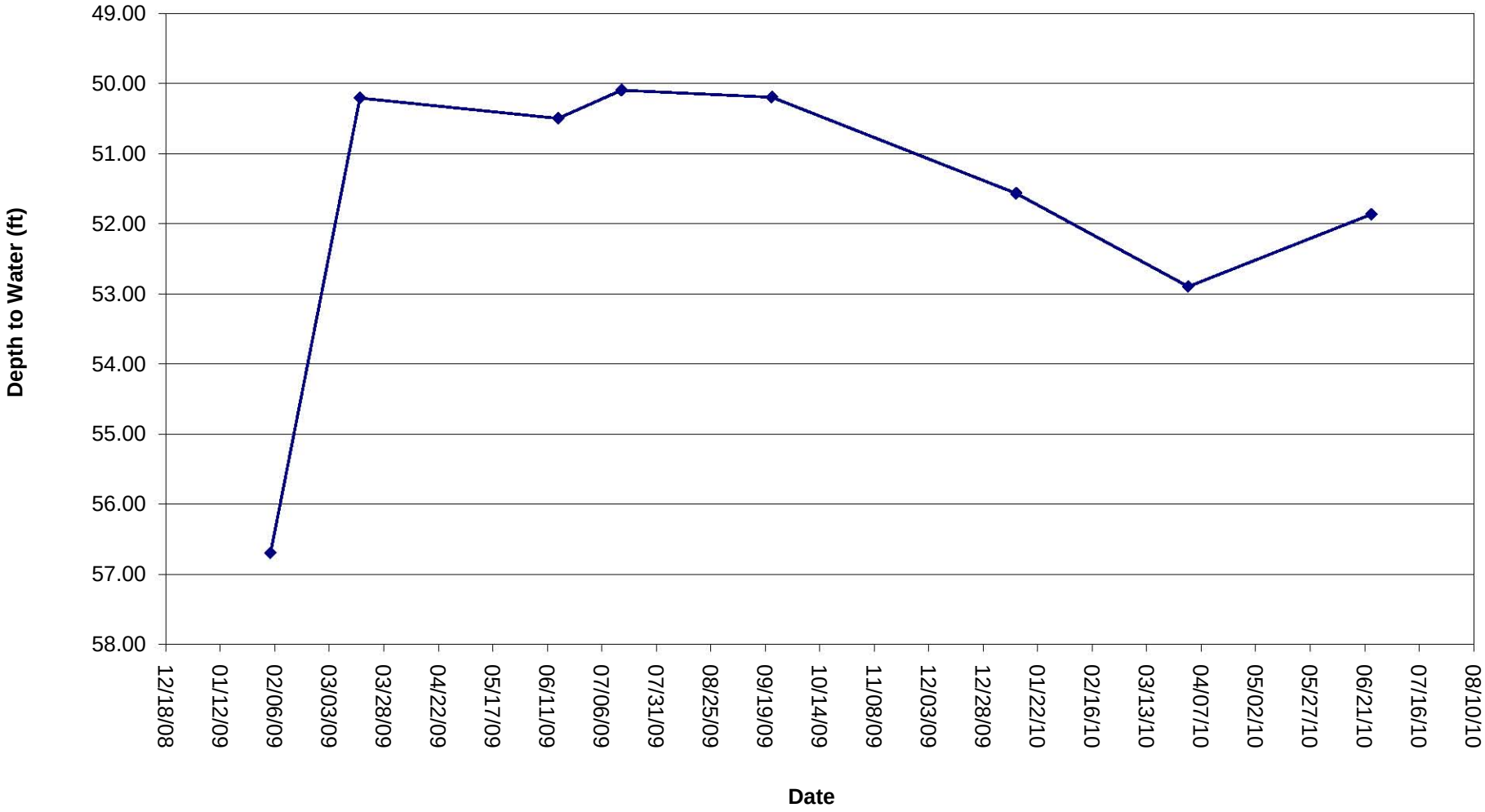
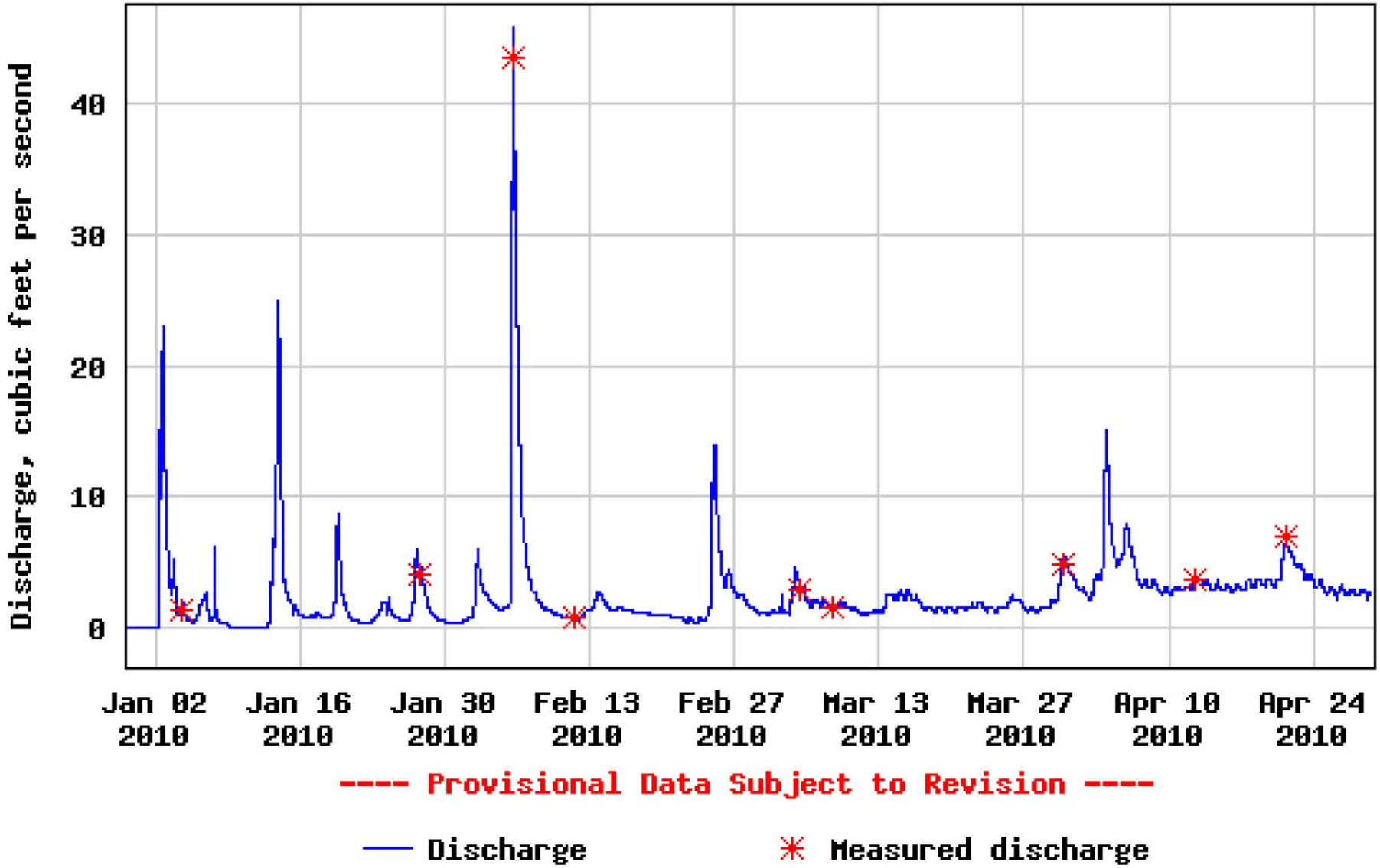
| | | | | ☐ | ☐ |
| | | | | ☐ | ☐ |

# East Ada Well Hydrograph - Stage Stop Shallow



USGS

# USGS 13210280 BLACKS CREEK AT KUNA-MORA ROAD XING NEAR BOISE ID



# Geologic Mapping Contract

- Needed to compliment and help interpret the limited subsurface hydrogeologic information for the East Ada County study area
- Contract with the Idaho Geological Survey
- Main products will include:
  - New geologic maps of the Mayfield quadrangle
  - Cross-sections synthesizing geologic, hydrogeologic, and geophysical information
  - Age dates from geochemical analyses

Boise Aquifer
Terrace Gravels

Volcanics –
Felsic Tuff
Overlying Granites

**Left:** Cross-cutting Trachyte Dikes

**Right:** Slickensides of the Blacks Creek Fault (normal fault)

Quarry with Massive Basalts of the Slater's Flat Volcano

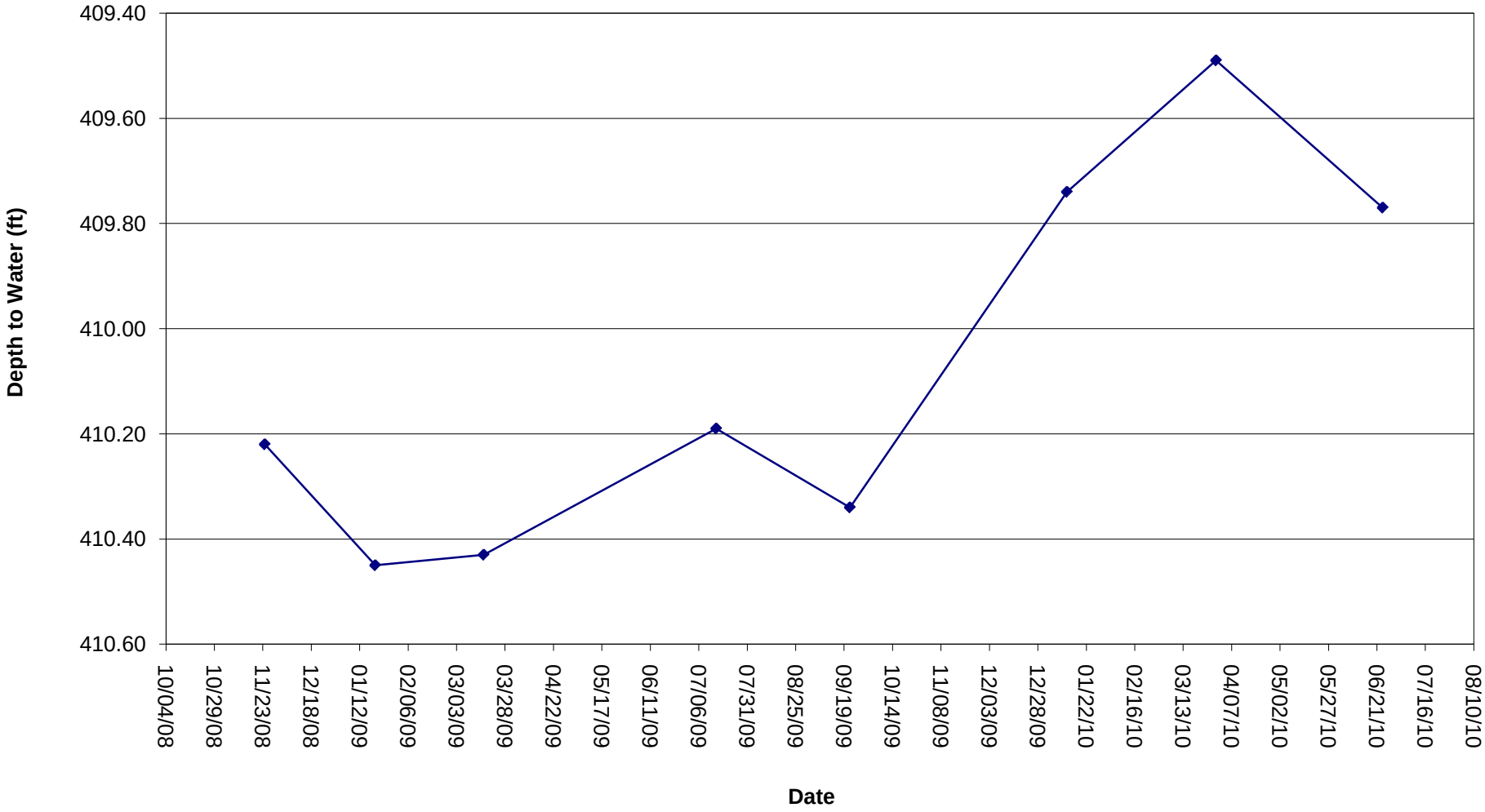
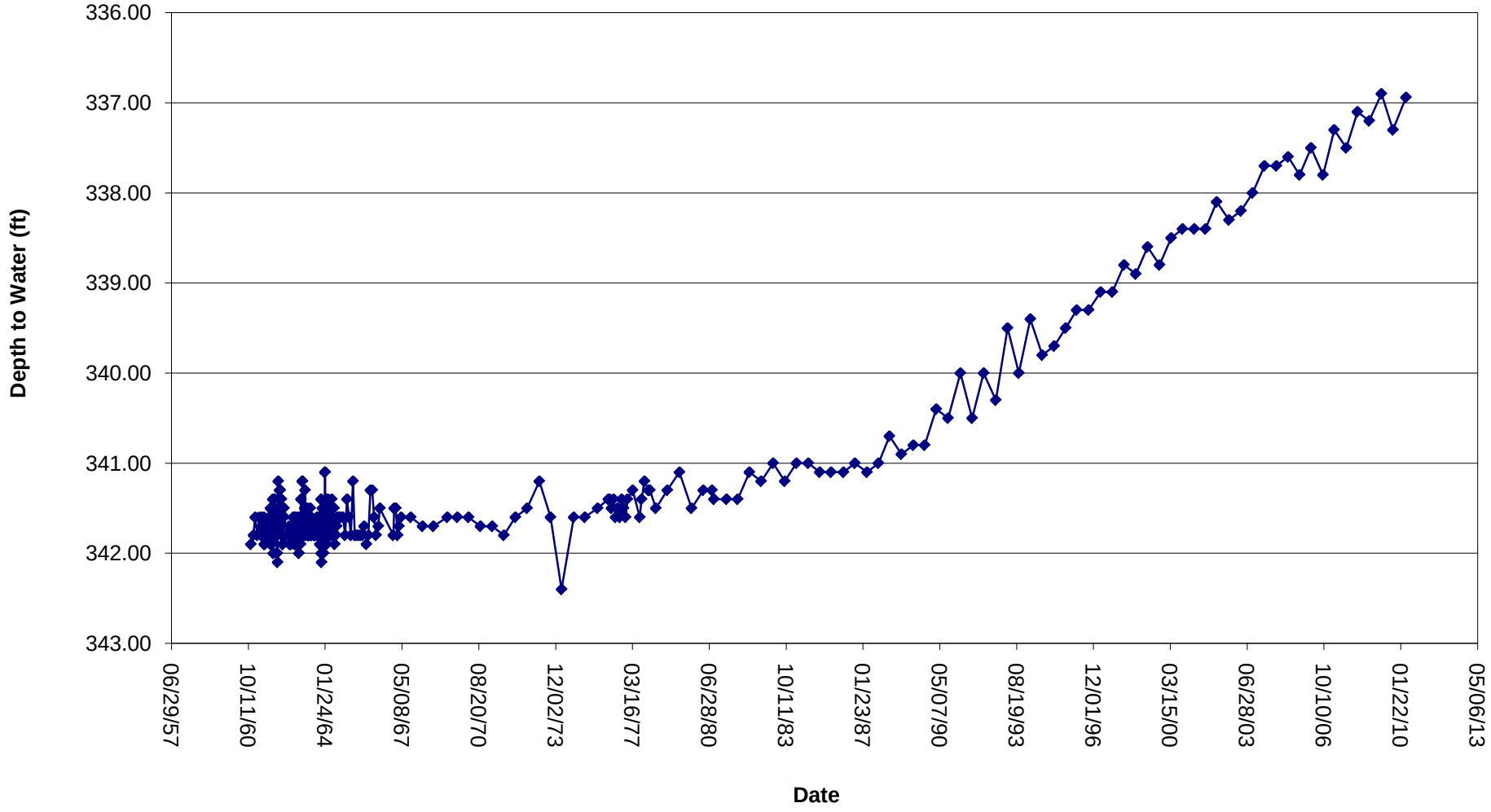
Indian Creek Sands –
Idaho Group or Local

# Other Contracts

- Geophysics – CGISS
- Stream Gaging – USGS
- Model Assessment – Western Water Consulting

Questions?
http://www.idwr.idaho.gov/WaterInformation/Projects/eada/

# East Ada Well Hydrograph - Regina



# East Ada Well Hydrograph - USGS-2