

**RECLAMATION DISTRICT NO. 1601  
TWITCHELL ISLAND  
BOARD OF TRUSTEES MEETING  
TUESDAY, JULY 20, 2021  
9:00 AM  
ENGINEER'S REPORT**

**I. PLAN REVIEW – USGS SEISMOGRAPH INSTALLATION**

- A. Review Draft Sites for an Encroachment Permit from USGS for the installation of seismic monitoring equipment.

*EXHIBIT A: Google Earth Site Map showing potential sites for Seismograph.*

*EXHIBIT B: Email Correspondence from Jemile Erdem regarding Draft Sites and request for Soil Boring Logs from RD 1601 Dated 7/12/21.*

*EXHIBIT C: Email Correspondence from KSN Inc. to Jem at USGS transmitting Soil Boring Logs for the District date 7/13/21.*

**II. PUMP STATION**

- A. On July 9th Bill Power from Power Hydrodynamics was onsite at the District Pump Station to perform pump testing for all three District Drainage pumps. Current pump station status was documented (water elevation, pump horsepower, pump make and model, etc.) along with other pertinent site data. Pump testing commenced after initial data collection. Pumps #1 and #3 were within range when compared to current flowmeter values and these two pumps were producing the desired flow rates. During the testing Pump #2 it was verified that only approximately 50% of the anticipated flow rate was being produced. It is highly likely that Pump #2 is experiencing a mechanical issue that is affecting its performance and output. While onsite, during pump testing, KSN Inc. noted that the temperature inside the pump house was quite hot due to the outside ambient temperature. Forecasted high temperatures for July 9th – July 12th were to exceed 100 degrees, with 109 degrees being the highest temperature expected. At this time, KSN Inc. suggested that an exhaust fan be installed on the north side of the pump house. In the meantime, a simple box fan was suggested to be installed over one of the louvered vents, directed outward, in order to create more air flow through the pump house. Another observation made during this time was the overwhelming amount of water hyacinth covering the area of the C-1 Canal. Water flow was being restricted at both trash racks and water flow was observed flowing under each rack and boiling up on the downstream sides. Our final observation of note was that the valves located on the discharge pipes were very hard to operate. The valve located on the discharge pipe to the east (Pump No. 2) was impossible to operate by hand and required use of a 24" pipe wrench to open/close the valve. The operating mechanism for this valve may need to be disassembled and serviced and/or replaced. The other two valves are difficult to turn but can still be operated by hand with no tools required.

***EXHIBIT D: Pump No 1 test reports from 7/9/21 pump test event***

***EXHIBIT E: Pump No 2 test reports from 7/9/21 pump test event***

***EXHIBIT F: Pump No 3 test reports from 7/9/21 pump test event***

B. On July 10th Jack Wilbur of KSN Inc. received a call from Rick Carter, Supt. which he was unable to answer. In the voicemail from Rick, he stated that Pump #1 was only producing roughly 70% of the desired/rated flow and that Pump #3 had a “fail to start alarm”. Jack then checked the station via remote access to the Human Machine Interface (HMI) and verified that Pump #1 flow was low and #3 was in an alarm state. Jack suggested corrective action via text message. Jack suspected that due to the overwhelming amount of vegetation in the canal Pump #1 flow was restricted at the inlet/bowl resulting in low flow. Regarding Pump #3 Jack believed that the electric motor experienced thermal overload due to extreme ambient temperature and high temperature in the pump house, number of starts and stops due to restricted flow at the trash racks and restricted flow at the pump inlet/bowl due to vegetation. Suggested remedies for these issues area as follows:

- *Clear all aquatic vegetation from the C-1 Canal and develop a routine PM (Preventive Maintenance) program for regular removal of vegetation that develops on the canal.*
- *Install a permanent exhaust fan, or two, at the pump house to purge hot air from the building and draw fresh air in. This will help with operating temps of the electric motors as well as keep electrical cabinets at a lower operating temperature. For the interim a simple box fan, or two, installed as suggested previously will be acceptable means to increase fresh air flow.*
- *Pump #2 will need to be taken out of service, pulled and inspected. Currently the District has Pump #2 out of service and isolated. Pumps #1 and #3 are in service with an alternating schedule with a lead/lag configuration.*

C. Pump Station level setpoints diagram has been updated and final document drafted.

***EXHIBIT G: RD 1601 Pump Station level setpoints chart for Peak and Non-Peak control***

D. The delivery and placement of fill on the east bank of the C-1 canal started up again Friday morning July 2, 2021 at around 8 AM:

1. Chris Koenig of ASTA Construction was operating a ASTA CAT D-6 Dozer to spread and place the delivered fill. Marvis was on vacation and Rick Carter was nursing recent hand surgery.

2. It was reported by Mani of Rapid Trans, LLC that 10 mega dump trucks were in operation today with the delivery of fill materials from the stockpile located on Grant Street in Concord, CA.
3. It was reported by Mani of Rapid Trans, LLC that 10 mega dump trucks were in operation on this date with the delivery of fill materials from the stockpile located on Grant Street in Concord, CA.
4. The fill materials were dumped into the ditch bank area and the D-6 dozer was used to push and orientate the material next to the canal. The thickness of fill material at the location of placement was approximately 3 to 4 feet thick x 20 feet wide. This material will eventually be pushed along the length of the canal bank areas to a thickness of approximately 2 to 3 feet thick. The material was being placed with a slope of 10% towards the water in the canal.
5. Fill material was found to be a light brown sandy silty clay type of material. This material was consistent with the material observed at the Grant Street stockpile located in Concord. The fill was clean of debris and relatively free of organic material. This material is suitable for use as levee fill material. The moisture content of the deliver fill material was observed to be approximately 2 to 4 percent over optimum water content per ASTM D-1557 – this is ideal for placement and compaction.

***EXHIBIT H: KSN Inc. Daily Field Report photo summary.***

### **III. ANNUAL TIDE CALENDARS**

#### **A. Review and distribute the Annual Tide Calendars**

***EXHIBIT I: Correspondence from KSN Inc. transmitting the Tide Calendars to the District dated July 2021 to December 2022 UNDER SEPARATE COVER.***

# Exhibit A

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# USGS SEISMOGRAPH

Draft Sites - RD 1601 Twitchell Island

Three-mile Slough

Warehouse

Well

Twitchell Island Ferry Rd

Oulton Point

Bradford Isl Levee Rd

Madre Dr

Center Rd

Bradford Island

## Legend

- 2014 Google Earth Shot
- Feature 1
- Island



1 mi

# Exhibit B

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**Christopher H. Neudeck**

**From:** Muhammad Khan <mkhan@ksninc.com>  
**Sent:** Wednesday, July 14, 2021 8:15 AM  
**To:** Christopher H. Neudeck  
**Subject:** File Transfer: Twitchell Island Soil Borings - Twitchell Seismic Monitoring Station

**Project: 1110-0990 Twitchell Seismic Monitoring Station**

Notification about File Transfer **Twitchell Island Soil Borings**

Note: You have been CC'd on this notification.

A transfer (File Transfer) has arrived on the KSN, Inc. Info Exchange Site.

**Remarks**

Good morning Jem,

Please find the download button below for the Twitchell Island soils borings data. Please keep in mind that this is more data than the three sites that were identified, but this file has all of the soils data on the Island for your use.

Thank you,  
Muhammad

[View the Transfer in Newforma Project Center](#)

[Download all files](#)

**File Transfer Info**

To: [jerdem@usgs.gov](mailto:jerdem@usgs.gov)  
CC: [rd1601@frontiernet.net](mailto:rd1601@frontiernet.net); [Don.Hoirup@water.ca.gov](mailto:Don.Hoirup@water.ca.gov); [Juan.Mercado@water.ca.gov](mailto:Juan.Mercado@water.ca.gov); [Chris Neudeck \(KSN, Inc.\)](mailto:Chris.Neudeck@ksn.com); [Muhammad Khan \(Kjeldsen, Sinnock & Neudeck, Inc.\)](mailto:Muhammad.Khan@ksn.com)  
Expiration Date: 7/28/2021

**Transferred Files**

|   |           |         |           |
|---|-----------|---------|-----------|
| <a href="#">Appendix 4 - Soil Boring Logs.pdf</a> | 7/13/2021 | 4:39 PM | 75,586 KB |
|---|-----------|---------|-----------|

**Additional Links**

[Reply to All](#)

# Exhibit C

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**Christopher H. Neudeck**

**From:** Erdem, Jemile E <jerdem@usgs.gov>  
**Sent:** Monday, July 12, 2021 12:35 PM  
**To:** Christopher H. Neudeck; rd1601@frontiernet.net; Hoirup, Don@DWR  
**Subject:** Twitchell Island pore pressure site selection  
**Attachments:** drill\_locations.kml

**CAUTION:** This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi All,

Thanks to Rick for showing me around Twitchell Island last week. I have attached a kml showing the coordinates of the three locations we identified as possible sites for the drilling. Could someone provide me with any available geotechnical reports from these three locations (or nearby locations)? This information would help us finalize our site selection and drilling plan, which I am hoping we can do in the next week or two.

Thank you all again for supporting this project.

Cheers,  
Jem

Jemile Erdem  
Geophysicist  
Earthquake Science Center  
U.S. Geological Survey  
345 Middlefield Rd., MS-977  
Menlo Park, CA 94025  
(650) 329-4714

# Exhibit D

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**CONFIDENTIAL/PROPRIETARY INFORMATION**

Rick Carter  
Rec Dist 1601 Twitchell Island  
P O Box 844  
Stockton, CA 95201

Tuesday, Jul 13, 2021

**SUBJECT: PUMPING COST ANALYSIS**  
HP: 100.00 Plant: Station 1 Pump 1  
PUMP TEST REFERENCE NUMBER: PT-25296  
PUMP TEST RUN: Run 1

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed Jul 09 2021 and information provided by you during the pump test.

It is recommended and assumed that:

- Overall plant efficiency can be improved to: 67%
- Water requirements will be the same as for the past year
- All operating conditions (annual hours of operation, discharge head, and water pumping level) will remain the same as they were at the time of the pump test

|                             | <b>EXISTING<br/>PLANT<br/>EFFICIENCY</b> | <b>IMPROVED<br/>PLANT<br/>EFFICIENCY</b> | <b>SAVINGS</b> |
|-----------------------------|--|--|----------------|
| kWh/AF                      | 43.9                                     | 30.2                                     | 13.70          |
| Estimated Total kWh         | 80,002                                   | 55,061                                   | 24,941         |
| Average Cost per kWh        | \$0.18                                   | \$0.18                                   |                |
| Average Cost per hour       | \$14.77                                  | \$16.12                                  | *              |
| Cost Per Acre Ft.           | \$8.1                                    | \$5.58                                   | \$2.53         |
| Estimated Acre Ft. Per Year | 1,823.10                                 | 1,823.10                                 |                |
| Run Hours                   | 1,000.00                                 | 1,000.00                                 |                |
| Overall Plant Efficiency    | 46.1%                                    | 67%                                      |                |
| Estimated Total Annual Cost | \$14,770.01                              | \$10,165.32                              | \$4,604.69     |

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued. If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,

William Thomas Power, III

Enclosures



Report ID: PT-25296

6301 Bearden Lane  
Modesto, CA 95357  
209.527.2908  
fax  
cal.powerhydrodynamics.com

**Agricultural and Domestic Pump Test Report**  
**Rec Dist 1601 Twitchell Island - Station 1 Pump 1 - Run 1**

Latitude: 38.9658  
Test Date: Jul 09 2021

Longitude: -121.65130  
Tester: Bill Power

Elevation: 0  
Nameplate HP: 100.00

| Customer Information   | Power Company Data   | Equipment Data  |
|--|--|---|
| <b>Rec Dist 1601 Twitchell Island</b><br><br>P O Box 844<br>Stockton, CA 95201<br><br>Contact: Rick Carter<br>Cell: 209-946-0268 | <b>PG&amp;E</b><br><br>Meter #: <b>1009485969</b><br>Rate Schedule: <b>AG5B</b><br>Average Cost: <b>\$0.18</b> | Motor Make: <b>U.S.</b><br>Volts/Amps: <b>460V/128.00A</b><br>Serial #: <b>T0620113006-000R0001</b><br>Pump Make: <b>Cascade</b><br>Pump Type: <b>Mix Flow</b><br>Drive Type: <b>Electric Motor</b><br>Gearhead Make: |

| Hydraulic Data   | Flow Data   |
|--|---|
| Pumping Water Level (PWL): 11.00 ft<br>Discharge Pressure: 3.80 lb/sqft<br>Discharge Level: 8.78 ft<br>Total Lift: 19.78 ft<br>Water Source: Canal | Run Number: 1 of 1<br>Measured Flow: 9901 gpm<br>Customer Flow: 8996 gpm<br>Flow Velocity: 4.73 ft/sec<br>Acre Feet per 24 Hr: 43.81<br>Cubic Feet Per Second (CFS): 22.05 ft |

| Power Data   |  |
|--|--|
| Horsepower Input to Motor: 107.24 hp<br>Brake Horsepower: 100.8 hp<br>Kilowatt Input to Motor: 80 kW<br>Energy Cost: \$14.77/hr<br>Nameplate RPM: 890 rpm<br>VFD: 0 hz | Percent of Rated Motor Load: 101%<br>Kilowatt Hours per Acre Foot: 43.88<br>Cost to Pump an Acre Foot: \$8.1<br><b>Overall Plant Efficiency: 46.11%</b><br>Water Horsepower: 49.45 hp<br>Run Hours: 1000 |

**Remarks**

All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.

This pump has an adequate test section.

This pump had a propeller type flow meter.

Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.

HPI measured with direct read KWI.

Overall efficiency of this plant is considered to be very low assuming this run represents plant's normal operating condition.

Rick Carter  
 Rec Dist 1601 Twitchell Island  
 P O Box 844  
 Stockton, CA 95201

**Pump Name:** Station 1 Pump 1

**HYDRAULIC TEST RESULTS**

PT-25296

**Test Date:** Jul 09 2021

**Tester:** Bill Power  
**Meter #:** 1009485969  
**Annual Run Hrs:** 1000

**Utility:** PG&E  
**Rate Sched:** AG5B  
**Avg Cost kWh:** \$0.18

**Meter kWh:** 1.80  
**Meter Const:** 80

**Motor Make:** U.S.  
**Volts:** 460  
**Gearhead Make:**  
**Pump Make:** Cascade  
**Water Source:** Canal

**Motor Serial:** T0620113006-000R0001  
**Amps:** 128.00  
**Nameplate RPM:** 890  
**Pump Type:** Mix Flow

**Horsepower:** 100.00  
**Drive Type:** Electric Motor  
**Pipe Diameter:** 29.25

| <b>Results</b>                      | <b>Test 1</b> |
|-------------------------------------|---------------|
| Discharge Pressure, PSI             | 3.80          |
| Standing Water Level, Feet          | 0             |
| Recovered Water Level               | 0.00          |
| Drawdown, Feet                      | 11            |
| Discharge Head, Feet                | 8.78          |
| Pumping Water Level, Feet           | 11.00         |
| Total Measured Head, Feet           | 8.778         |
| Measured GPM                        | 9901.00       |
| Customer Meter, GPM                 | 8996.00       |
| Well Yield, GPM/ft Drawdown         | 900.09        |
| Acre Feet Pumped in 24 Hours        | 43.81         |
| kW Input to Motor                   | 80            |
| HP Input to Motor                   | 107.24        |
| Motor Load %                        | 100.8         |
| Measured Speed of Pump, RPM         |               |
| VFD, Hz:                            |               |
| <b>kWh per Acre Foot</b>            | <b>43.88</b>  |
| <b>Overall Plant Efficiency (%)</b> | <b>46.1</b>   |
| Energy Cost per Hour                | 14.77         |
| Water Horsepower, hp                | 49.45         |
| Flow Velocity, ft/sec               | 4.73          |

# Exhibit E

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**CONFIDENTIAL/PROPRIETARY INFORMATION**

Rick Carter  
Rec Dist 1601 Twitchell Island  
P O Box 844  
Stockton, CA 95201

Tuesday, Jul 13, 2021

**SUBJECT: PUMPING COST ANALYSIS**  
HP: 100.00 Plant: Station 1 Pump 2  
PUMP TEST REFERENCE NUMBER: PT-25297  
PUMP TEST RUN: Run 1

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed Jul 09 2021 and information provided by you during the pump test.

It is recommended and assumed that:

- Overall plant efficiency can be improved to: 67%
- Water requirements will be the same as for the past year
- All operating conditions (annual hours of operation, discharge head, and water pumping level) will remain the same as they were at the time of the pump test

|                             | EXISTING<br>PLANT<br>EFFICIENCY | IMPROVED<br>PLANT<br>EFFICIENCY | SAVINGS    |
|-----------------------------|---------------------------------|---------------------------------|------------|
| kWh/AF                      | 87.2                            | 32.3                            | 54.90      |
| Estimated Total kWh         | 71,162                          | 26,380                          | 44,782     |
| Average Cost per kWh        | \$0.18                          | \$0.18                          |            |
| Average Cost per hour       | \$13.14                         | \$16.65                         | *          |
| Cost Per Acre Ft.           | \$16.1                          | \$5.97                          | \$10.13    |
| Estimated Acre Ft. Per Year | 816.26                          | 816.26                          |            |
| Run Hours                   | 1,000.00                        | 1,000.00                        |            |
| Overall Plant Efficiency    | 24.8%                           | 67%                             |            |
| Estimated Total Annual Cost | \$13,137.92                     | \$4,870.29                      | \$8,267.63 |

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued. If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,

William Thomas Power, III

Enclosures



6301 Bearden Lane  
 Modesto, CA 95357  
 209.527.2908  
 fax  
 cal.powerhydrodynamics.com

Report ID: PT-25297

**Agricultural and Domestic Pump Test Report  
 Rec Dist 1601 Twitchell Island - Station 1 Pump 2 - Run 1**

Latitude: 38.9658  
 Test Date: Jul 09 2021

Longitude: -121.65130  
 Tester: Bill Power

Elevation: 0  
 Nameplate HP: 100.00

| Customer Information   | Power Company Data   | Equipment Data   |
|--|--|--|
| <b>Rec Dist 1601 Twitchell Island</b><br><br>P O Box 844<br>Stockton, CA 95201<br><br>Contact: Rick Carter<br>Cell: 209-946-0268 | <b>PG&amp;E</b><br><br>Meter #: <b>1009485969</b><br>Rate Schedule: <b>AG5B</b><br>Average Cost: <b>\$0.18</b> | Motor Make: <b>Westinghouse</b><br>Volts/Amps: <b>440V/119.00A</b><br>Serial #: <b>8058850</b><br>Pump Make: <b>No Name Plate</b><br>Pump Type: <b>Mix Flow</b><br>Drive Type: <b>Electric Motor</b><br>Gearhead Make: |

| Hydraulic Data  | Flow Data  |
|---|--|
| Pumping Water Level (PWL): 11.00 ft<br>Discharge Pressure: 4.40 lb/sqft<br>Discharge Level: 10.16 ft<br>Total Lift: 21.16 ft<br>Water Source: Canal | Run Number: 1 of 1<br>Measured Flow: 4433 gpm<br>Customer Flow: 5401 gpm<br>Flow Velocity: 2.12 ft/sec<br>Acre Feet per 24 Hr: 19.62<br>Cubic Feet Per Second (CFS): 9.87 ft |

| Power Data  |  |
|---|--|
| Horsepower Input to Motor: 95.39 hp<br>Brake Horsepower: 86.8 hp<br>Kilowatt Input to Motor: 71.16 kW<br>Energy Cost: \$13.14/hr<br>Nameplate RPM: 860 rpm<br>VFD: 0 hz | Percent of Rated Motor Load: 87%<br>Kilowatt Hours per Acre Foot: 87.18<br>Cost to Pump an Acre Foot: \$16.1<br><b>Overall Plant Efficiency: 24.84%</b><br>Water Horsepower: 23.69 hp<br>Run Hours: 1000 |

**Remarks**

All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance.

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This pump has an adequate test section.

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This pump had a propeller type flow meter.

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Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.

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HPI measured with direct read KWI.

---

Overall efficiency of this plant is considered to be very low assuming this run represents plant's normal operating condition.

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6301 Bearden Lane  
Modesto, CA 95357  
209.527.2908  
fax  
cal.powerhydrodynamics.com

Report ID: PT-25297

Rick Carter  
Rec Dist 1601 Twitchell Island  
P O Box 844  
Stockton, CA 95201

**Pump Name:** Station 1 Pump 2

**HYDRAULIC TEST RESULTS**

PT-25297

**Test Date:** Jul 09 2021

**Tester:** Bill Power  
**Meter #:** 1009485969  
**Annual Run Hrs:** 1000

**Utility:** PG&E  
**Rate Sched:** AG5B  
**Avg Cost kWh:** \$0.18

**Meter kWh:** 1.80  
**Meter Const:** 80

**Motor Make:** Westinghouse  
**Volts:** 440  
**Gearhead Make:**  
**Pump Make:** No Name Plate  
**Water Source:** Canal

**Motor Serial:** 8058850  
**Amps:** 119.00  
**NameplateRPM:** 860  
**Pump Type:** Mix Flow

**Horsepower:** 100.00  
**Drive Type:** Electric Motor  
**Pipe Diameter:** 29.25

| <b>Results</b>                      | <b>Test 1</b> |
|-------------------------------------|---------------|
| Discharge Pressure, PSI             | 4.40          |
| Standing Water Level, Feet          | 0             |
| Recovered Water Level               | 0.00          |
| Drawdown, Feet                      | 11            |
| Discharge Head, Feet                | 10.16         |
| Pumping Water Level, Feet           | 11.00         |
| Total Measured Head, Feet           | 10.164        |
| Measured GPM                        | 4433.00       |
| Customer Meter, GPM                 | 5401.00       |
| Well Yield, GPM/ft Drawdown         | 403           |
| Acre Feet Pumped in 24 Hours        | 19.62         |
| kW Input to Motor                   | 71.16         |
| HP Input to Motor                   | 95.39         |
| Motor Load %                        | 86.8          |
| Measured Speed of Pump, RPM         |               |
| VFD, Hz:                            |               |
| <b>kWh per Acre Foot</b>            | <b>87.18</b>  |
| <b>Overall Plant Efficiency (%)</b> | <b>24.8</b>   |
| Energy Cost per Hour                | 13.14         |
| Water Horsepower, hp                | 23.69         |
| Flow Velocity, ft/sec               | 2.12          |

# Exhibit F

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**CONFIDENTIAL/PROPRIETARY INFORMATION**

Rick Carter  
Rec Dist 1601 Twitchell Island  
P O Box 844  
Stockton, CA 95201

Tuesday, Jul 13, 2021

**SUBJECT: PUMPING COST ANALYSIS**  
HP: 100.00 Plant: Station 1 Pump 3  
PUMP TEST REFERENCE NUMBER: PT-25298  
PUMP TEST RUN: Run 1

The following Pumping Cost Analysis is presented as an aid to your cost accounting. This analysis is an estimate prepared from operating criteria supplied from the pump test performed Jul 09 2021 and information provided by you during the pump test.

It is recommended and assumed that:

- **Overall plant efficiency can be improved to: 67%**
- **Water requirements will be the same as for the past year**
- **All operating conditions (annual hours of operation, discharge head, and water pumping level) will remain the same as they were at the time of the pump test**

|                             | <b>EXISTING<br/>PLANT<br/>EFFICIENCY</b> | <b>IMPROVED<br/>PLANT<br/>EFFICIENCY</b> | <b>SAVINGS</b> |
|-----------------------------|--|--|----------------|
| kWh/AF                      | 59.8                                     | 32.3                                     | 27.50          |
| Estimated Total kWh         | 94,443                                   | 51,005                                   | 43,438         |
| Average Cost per kWh        | \$0.18                                   | \$0.18                                   |                |
| Average Cost per hour       | \$17.44                                  | \$16.65                                  | \$0.79         |
| Cost Per Acre Ft.           | \$11.05                                  | \$5.97                                   | \$5.08         |
| Estimated Acre Ft. Per Year | 1,578.21                                 | 1,578.21                                 |                |
| Run Hours                   | 1,000.00                                 | 1,000.00                                 |                |
| Overall Plant Efficiency    | 36.2%                                    | 67%                                      |                |
| Estimated Total Annual Cost | \$17,435.99                              | \$9,416.49                               | \$8,019.51     |

It is sincerely hoped that this information will prove helpful to you, and that your concerns over maintaining optimum pumping efficiency will be continued. If you have any questions, please contact Bill Power at (209) 527-2908.

Regards,

William Thomas Power, III

Enclosures



6301 Bearden Lane  
 Modesto, CA 95357  
 209.527.2908  
 fax  
 cal.powerhydrodynamics.com

Report ID: PT-25298

**Agricultural and Domestic Pump Test Report  
 Rec Dist 1601 Twitchell Island - Station 1 Pump 3 - Run 1**

Latitude: 38.9658  
 Test Date: Jul 09 2021

Longitude: -121.65130  
 Tester: Bill Power

Elevation: 0  
 Nameplate HP: 100.00

| Customer Information   | Power Company Data   | Equipment Data  |
|--|--|---|
| <b>Rec Dist 1601 Twitchell Island</b><br><br>P O Box 844<br>Stockton, CA 95201<br><br>Contact: Rick Carter<br>Cell: 209-946-0268 | <b>PG&amp;E</b><br><br>Meter #: <b>1009485969</b><br>Rate Schedule: <b>AG5B</b><br>Average Cost: <b>\$0.18</b> | Motor Make: <b>U.S.</b><br>Volts/Amps: <b>440V/128.00A</b><br>Serial #:<br>Pump Make: <b>Cascade</b><br>Pump Type: <b>Mix Flow</b><br>Drive Type: <b>Electric Motor</b><br>Gearhead Make: |

| Hydraulic Data  | Flow Data   |
|---|---|
| Pumping Water Level (PWL): 11.00 ft<br>Discharge Pressure: 4.40 lb/sqft<br>Discharge Level: 10.16 ft<br>Total Lift: 21.16 ft<br>Water Source: Canal | Run Number: 1 of 1<br>Measured Flow: 8571 gpm<br>Customer Flow: 8162 gpm<br>Flow Velocity: 4.09 ft/sec<br>Acre Feet per 24 Hr: 37.92<br>Cubic Feet Per Second (CFS): 19.09 ft |

| Power Data   |  |
|--|--|
| Horsepower Input to Motor: 126.6 hp<br>Brake Horsepower: 115.2 hp<br>Kilowatt Input to Motor: 94.44 kW<br>Energy Cost: \$17.44/hr<br>Nameplate RPM: 890 rpm<br>VFD: 0 hz | Percent of Rated Motor Load: 115%<br>Kilowatt Hours per Acre Foot: 59.84<br>Cost to Pump an Acre Foot: \$11.05<br><b>Overall Plant Efficiency: 36.18%</b><br>Water Horsepower: 45.81 hp<br>Run Hours: 1000 |

| Remarks   |
|---|
| All results are based on conditions during the time of the test. If these conditions vary from the normal operation of your pump, the results shown may not describe the pump's normal performance. |
| <u>This pump has an adequate test section.</u>  |
| <u>This pump had a propeller type flow meter.</u>   |
| Based on information obtained at the time the test was performed, this test represents the pumps standard operating conditions.   |
| <u>HPI measured with direct read KWI.</u>   |
| Overall efficiency of this plant is considered to be very low assuming this run represents plant's normal operating condition.  |



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Modesto, CA 95357  
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Report ID: PT-25298

Rick Carter  
Rec Dist 1601 Twitchell Island  
P O Box 844  
Stockton, CA 95201

**Pump Name:** Station 1 Pump 3

**HYDRAULIC TEST RESULTS**

PT-25298

**Test Date:** Jul 09 2021

**Tester:** Bill Power  
**Meter #:** 1009485969  
**Annual Run Hrs:** 1000

**Utility:** PG&E  
**Rate Sched:** AG5B  
**Avg Cost kWh:** \$0.18

**Meter kH:** 1.80  
**Meter Const:** 80

**Motor Make:** U.S.  
**Volts:** 440  
**Gearhead Make:**  
**Pump Make:** Cascade  
**Water Source:** Canal

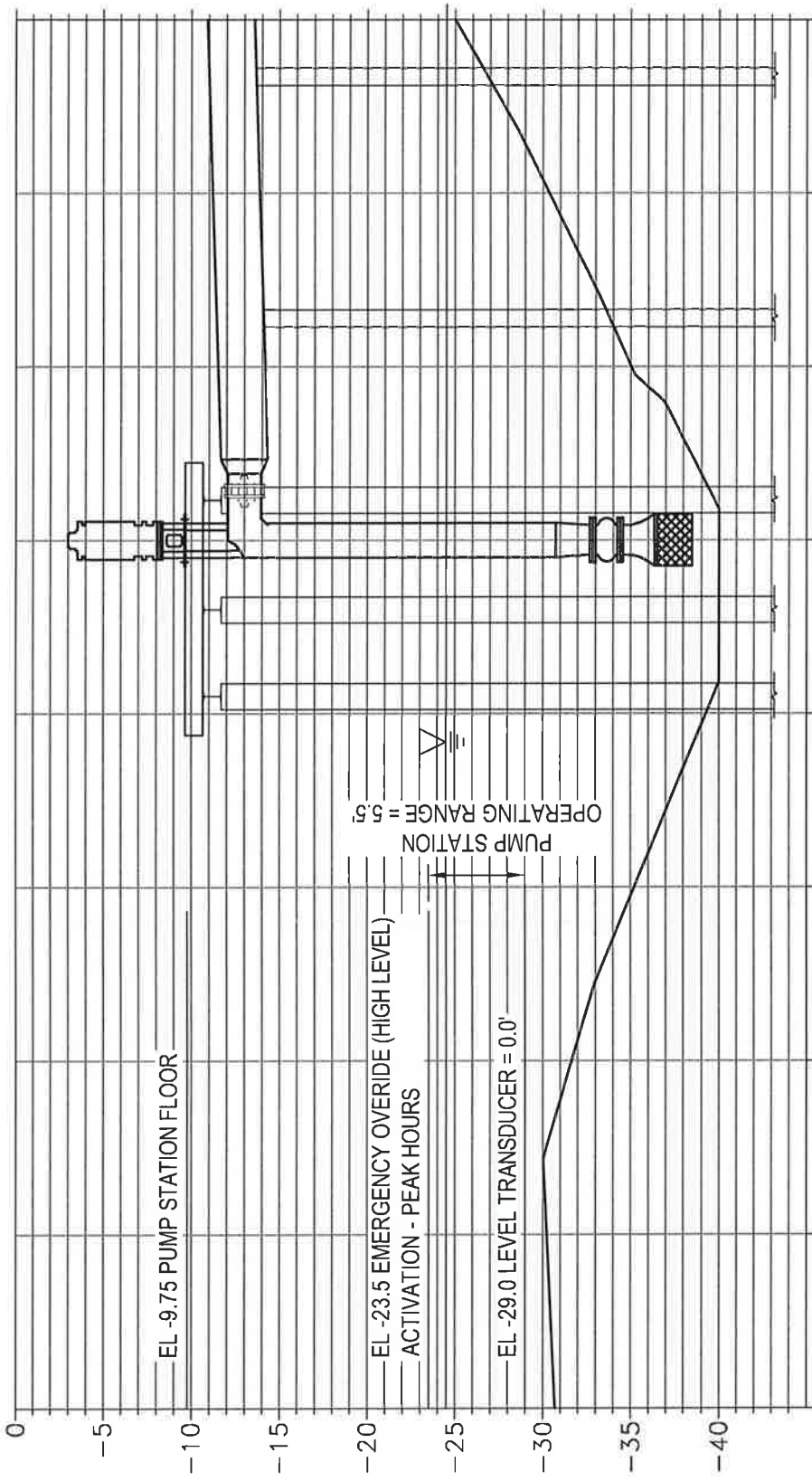
**Motor Serial:**  
**Amps:** 128.00  
**NameplateRPM:** 890  
**Pump Type:** Mix Flow

**Horsepower:** 100.00  
**Drive Type:** Electric Motor  
**Pipe Diameter:** 29.25

| <b>Results</b>                      | <b>Test 1</b> |
|-------------------------------------|---------------|
| Discharge Pressure, PSI             | 4.40          |
| Standing Water Level, Feet          | 0             |
| Recovered Water Level               | 0.00          |
| Drawdown, Feet                      | 11            |
| Discharge Head, Feet                | 10.16         |
| Pumping Water Level, Feet           | 11.00         |
| Total Measured Head, Feet           | 10.164        |
| Measured GPM                        | 8571.00       |
| Customer Meter, GPM                 | 8162.00       |
| Well Yield, GPM/ft Drawdown         | 779.18        |
| Acre Feet Pumped in 24 Hours        | 37.92         |
| kW Input to Motor                   | 94.44         |
| HP Input to Motor                   | 126.6         |
| Motor Load %                        | 115.2         |
| Measured Speed of Pump, RPM         |               |
| VFD, Hz:                            |               |
| <b>kWh per Acre Foot</b>            | <b>59.84</b>  |
| <b>Overall Plant Efficiency (%)</b> | <b>36.2</b>   |
| Energy Cost per Hour                | 17.44         |
| Water Horsepower, hp                | 45.81         |
| Flow Velocity, ft/sec               | 4.09          |

# Exhibit G

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EMERGENCY HIGH LEVEL OPERATION<sup>1</sup>

|               | PEAK HOURS | NON-PEAK HOURS |
|---------------|------------|----------------|
| LAG PUMP ON   | 5.5'       | 4.5'           |
| LAG PUMP OFF  | 4.6'       | 3.5'           |
| LEAD PUMP ON  | 5.35'      | 3.6'           |
| LEAD PUMP OFF | 4.8'       | 2.9'           |

NOTE:

- EMERGENCY HIGH LEVEL OPERATION DURING PEAK HOURS TO PROTECT NW AREA (JAIME R.) FIELDS FROM SUBMERGENCE.


**KJELDSEN SINNOCK NEUDECK**  
 CIVIL ENGINEERS & LAND SURVEYORS  
 WWW.KSTINC.COM  
 711 N. Peashing Avenue  
 Stockton, CA 95203  
 209-946-0268  
 1550 Harbor Blvd., Suite 212  
 West Sacramento, CA 95651  
 916-403-5900

RECLAMATION DISTRICT NO. 1601  
 TWITCHELL ISLAND  
 PUMP STATION START LOG

DRAWING SCALE

1" = 10'

ORIG. DRAWING SCALE

0 1/4" = 1/2"



EXHIBIT NO.

A

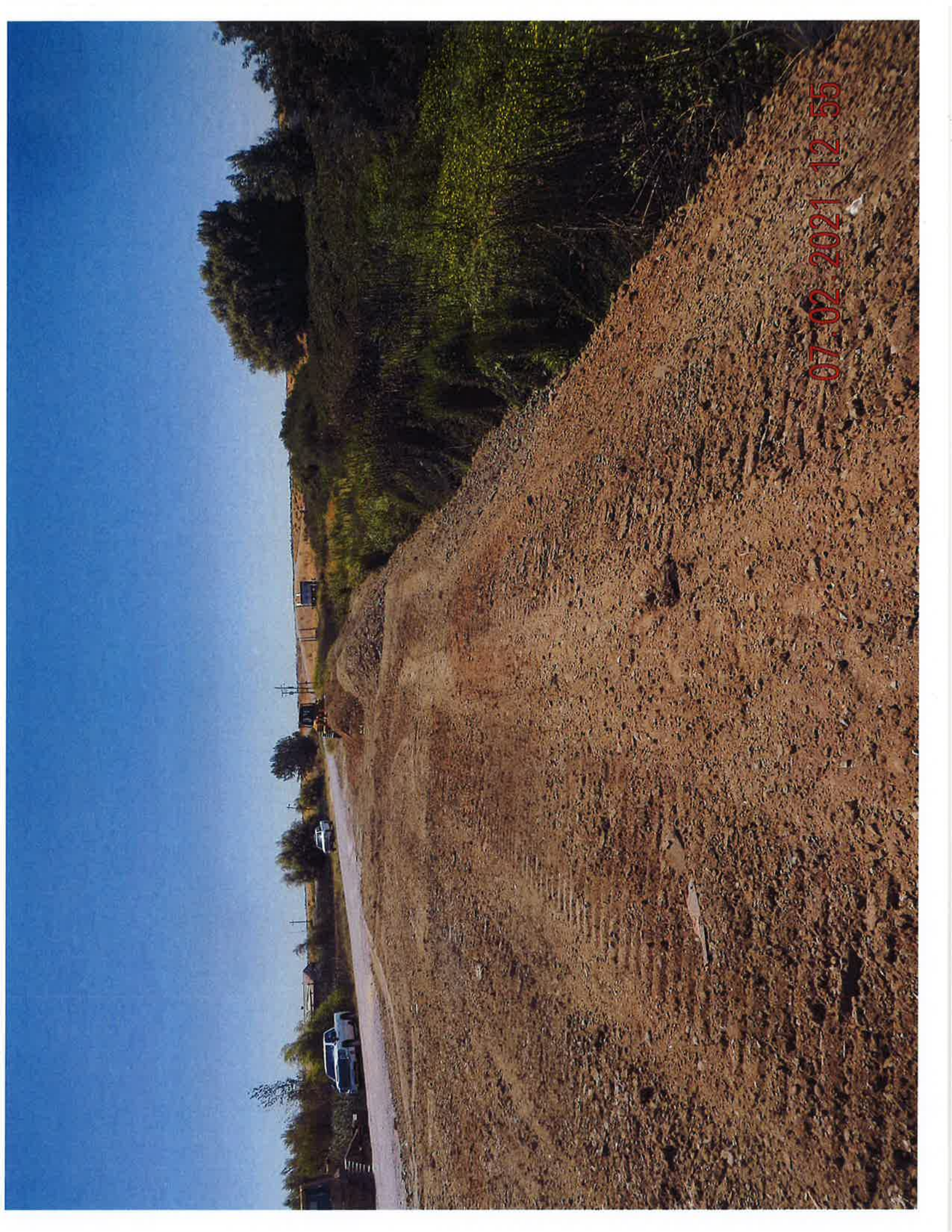
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# Exhibit H

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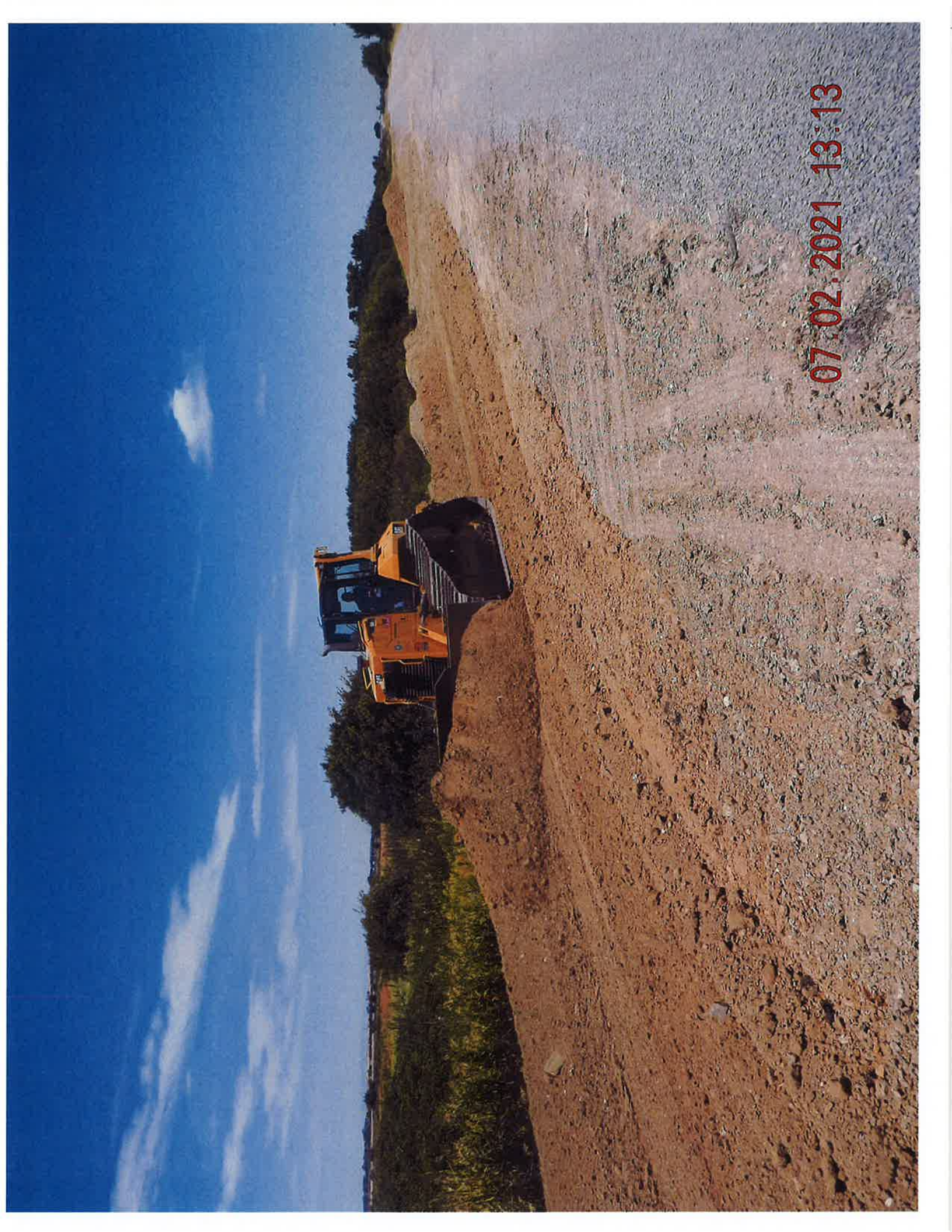




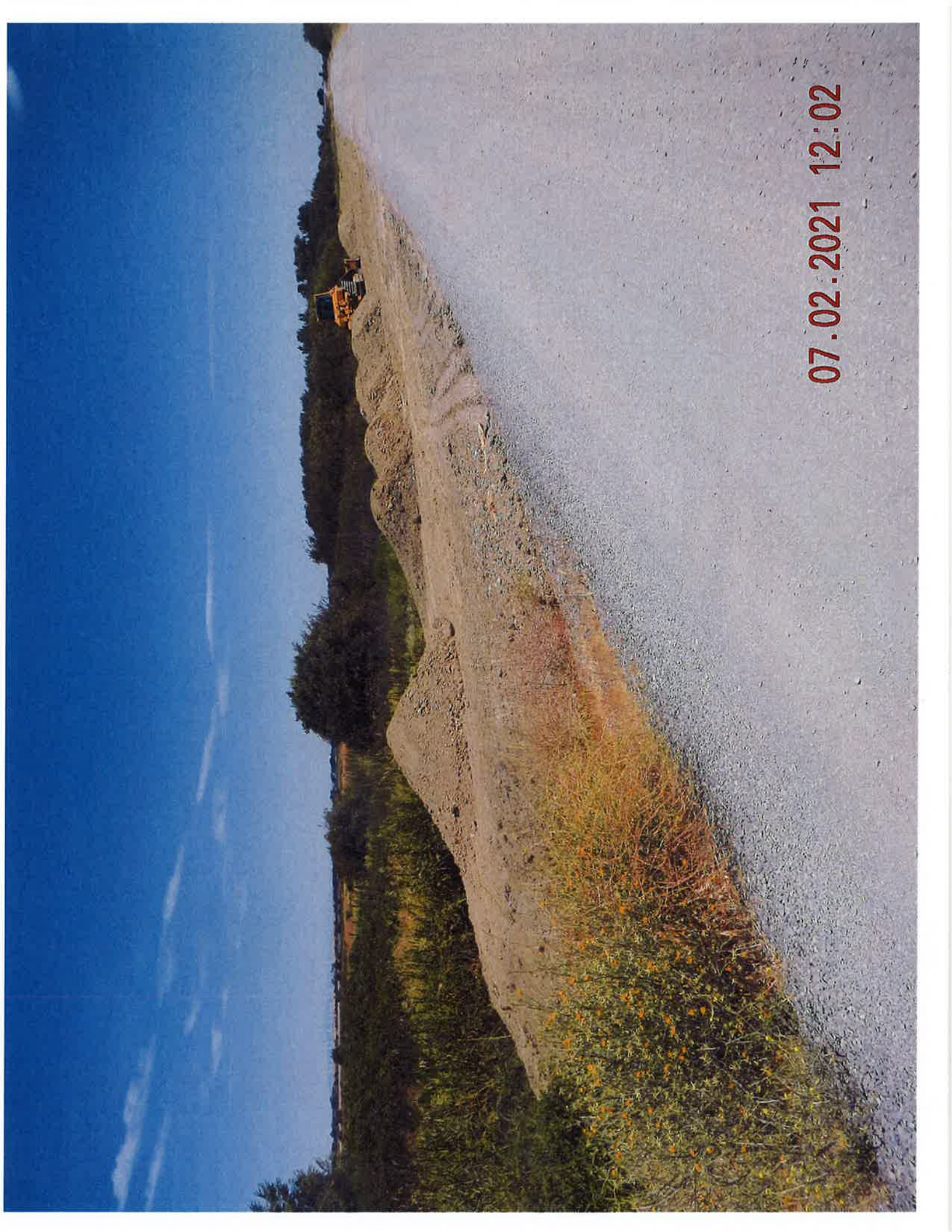
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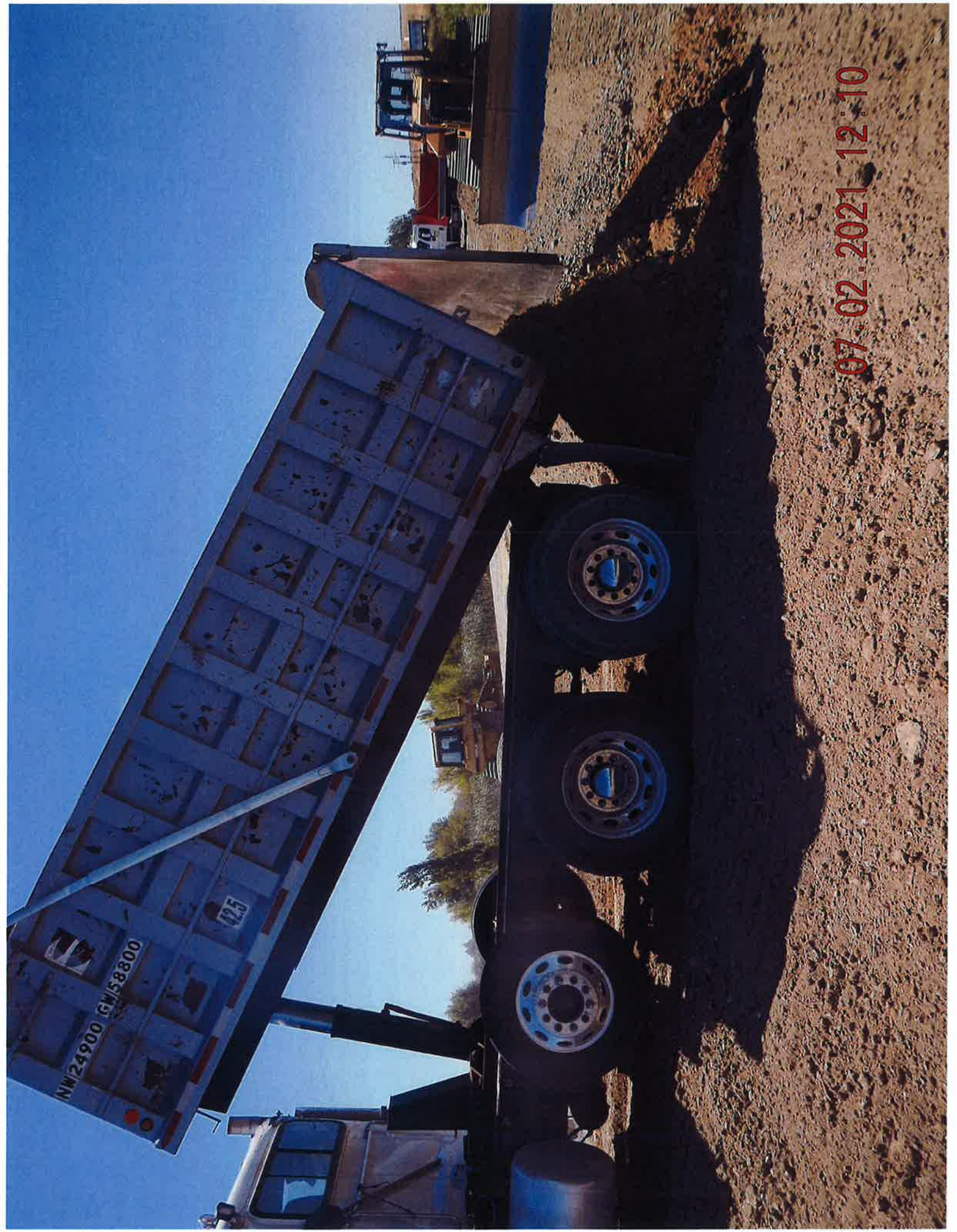
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07.02.2021 12:10



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07.02.2021 12:37



07-02-2021 12:54



07.02.2021 12:54

ANNUAL  
TIDE  
CALENDAR

**(Under Separate Cover)**

EXHIBIT I