



DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

ENTERED



Colonel Dawn A. Nickell, USAF
Vice Commander
377th Air Base Wing
2000 Wyoming Blvd SE
Kirtland AFB NM 87117

APR 24 2018

Ms. Michelle Hunter
Ground Water Quality Bureau (GWQB)
New Mexico Environment Department (NMED)
Harrold Runnels Building
1190 Saint Francis Drive
Santa Fe New Mexico 87502

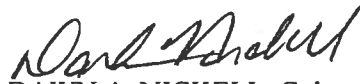


Dear Ms. Hunter

Attached please find the *Effluent Conveyance Line Integrity Testing Report of the Groundwater Treatment System*. This procedure has been prepared to summarize the testing performed to ensure compliance with Condition 15 of the Discharge Permit DP-1839 associated with the discharge of treated water from the groundwater treatment system at ST-106/SS-111.

If you have any questions or concerns, please contact Mr. Scott Clark at (505) 846-9017 or at scott.clark@us.af.mil or Mrs. Holly O'Grady at (505) 853-3484 or at holly.ogradey@us.af.mil.

Sincerely


DAWN A. NICKELL, Colonel, USAF
Vice Commander

Attachment:

Effluent Conveyance Line Integrity Testing Report of the Groundwater Treatment System; 2 Hard Copies/2 CDs

cc:

NMED (Borrego) letter
NMED-OOTS (McQuillan), letter and CD
NMED HWB (Kielsing), letter and CD
EPA Region 6 (King, Ellinger), letter and CD
COA (Faris), letter and CD
ABCWUA (Shean), letter and CD
SAF-IEE (Lynnes), electronic only
AFCEC/CZ (Renaghan, Clark, O'Grady), electronic only
USACE-ABQ District Office (Simpler, Phaneuf, Dreeland, Sanchez, Salazar), electronic only
Public Info Repository, Administrative Record/Information Repository (AR/IR) and File





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**EFFLUENT CONVEYANCE LINE INTEGRITY TESTING SUMMARY
FROM THE GROUNDWATER TREATMENT SYSTEM TO KAFB-7
APRIL 4, 2018**

The groundwater treatment system (GWTS) conveys treated effluent water to two discharge locations, the Tijeras Arroyo Golf Course Main Pond and the gravity-fed injection well KAFB-7. Discharge into KAFB-7 is performed in accordance with the New Mexico Environment Department (NMED) Discharge Permit DP-1839 (NMED, 2017). Condition Number (No.) 15 of DP-1839 states the following:

The Permittee shall ensure the treated effluent conveyance system, i.e., piping, between the GWTS and the UIC well(s) does not leak and shall report any such leakage to the NMED GWQB in accordance with 20.6.2.1203(A) NMAC and copy the NMED HWB. Within 1 year of the effective date of this Discharge Permit, the Permittee shall demonstrate the structural integrity of the treated effluent conveyance system between the GWTS and KAFB-7. Prior to testing, the Permittee shall propose for NMED approval the test method to be used. The results of the mechanical integrity testing shall be submitted to NMED within 60 days of test completion. The Permittee shall integrity test the treated effluent conveyance system between GWTS and the UIC well(s) prior to submitting a permit renewal application.

This test report summarizes the results of testing performed on April 4, 2018, in compliance with the year one testing requirement.

TESTING SETUP AND PROCEDURE

All testing was performed in accordance with the NMED approved Standard Operating Procedure for Effluent Conveyance Line Integrity Testing (U.S. Army Corps of Engineers [USACE], 2018) and the GWTS Operations and Maintenance Plan (USACE, 2016).

TESTING RESULTS

Initial Test: GWTS to KAFB-7

The entire effluent conveyance line between the GWTS facility and KAFB-7 was isolated and hydrostatically pressurized up to 50 pounds per square inch (psi). After initial pressurization, the KAFB-7 well head was visually inspected for leaks during the 30-minute makeup period. During the inspection, the KAFB-7 well head pressure transducer, located downstream of the effluent isolation valve (Figure 1), was reading 56 psi indicating that the isolation valve was not functioning properly. It is believed that the valve malfunction was caused by fine sediment buildup within the valve seat causing the valve to remain open.

Several unsuccessful attempts were made to re-seat the valve. The sediment cannot be manually removed from the valve as it is located below grade and was inserted directly into the pipeline. Additionally, as a result of the March 14, 2018 failure of the hydraulic lines that control the functioning of the downhole V-smart valve in KAFB-7, pressurized flow through the line cannot not be used to scour sediment from the isolation valve until the V-smart valve is repaired.

Therefore, the test of the section of conveyance line between the changeover valves and the wellhead could not be completed per the Standard Operating Procedure (SOP) specifications as utilization of the V-smart valve as an isolation point could not be maintained for the full 90 minutes required in the SOP due to potential damage to the V-smart valve or the well from sustaining pressure in the downhole drop pipe. However, the section of the conveyance line from the GWTS to KAFB-7 held 56 psi (KAFB-7) for

approximately 25 minutes before the testing was aborted and there was minimal indication of pressure loss from the line. The section of line will be retested (Figure 1) following repairs to the KAFB-7 injection system.

Second Test: GWTS to Changeover Valves

Prior to starting the second test, the conveyance line pressure was relieved to the Tijeras Arroyo Golf Course main pond. Once the pressure had been relieved, the second test was initiated on the conveyance line between the GWTS facility and the changeover valves (Figure 1). Hydrostatic testing of this section was completed within the SOP specifications. The hydrostatic test on this section began with the 30-minute expansion makeup period initiated at 1130. Makeup water was added at two intervals during this period at 1145 and 1155. The initial pressure reading of 50.00 psi was collected at 1200 and successive readings were collected at 5-minute intervals thereafter until 1300. The pressure versus time profile is provided in Figure 2. The final pressure reading collected was 49.12 psi, resulting in an overall loss of pressure of 0.88 psi, or less than 2 percent (%) of the initial pressure. This 2% difference in pressure is within the acceptable range of $\pm 30\%$ as provided in the SOP specifications (USACE, 2018). No leaks were observed along any of the exposed piping. The field testing form is provided in Attachment 1, and a photographic log is provided in Attachment 2.

FINDINGS AND RECOMMENDATIONS

1. The section of conveyance line piping from the GWTS to the changeover valves was hydrostatically tested in conformance with the SOP and found acceptable.
2. The section of the conveyance line pipe from the changeover valves to KAFB-7 held pressure, but could not be tested in full conformance with the SOP due to faulty seating of the isolation valve upstream of the V-smart valve and possible damage to the V-smart valve if the test was continued.
3. The section of the conveyance line pipe from the changeover valves to KAFB-7 should be re-tested following completion of repairs to the V-smart valve assembly.

REFERENCES

- New Mexico Environment Department (NMED). 2017. Correspondence from Michelle Hunter, Chief, Ground Water Quality Bureau to Colonel Eric. H. Froehlich, Base Commander, Kirtland Air Force Base, New Mexico, Regarding Discharge Permit Issuance, DP-1839, Kirtland Air Force Base. April 28.
- U.S. Army Corps of Engineers (USACE). 2016. *Operations and Maintenance Plan, Groundwater Treatment System – Annual Update, Bulk Fuels Facility, SWMU ST-106/SS-111, Kirtland Air Force Base, New Mexico*. Prepared by EA Engineering, Science, and Technology, Inc., PBC for the USACE–Albuquerque District under USACE Contract No. W912DR-12-D-0006. August.
- USACE. 2018. *Standard Operating Procedure for Effluent Conveyance Line Integrity Testing of the Groundwater Treatment System*. Prepared by EA Engineering, Science, and Technology, Inc., PBC for the USACE–Albuquerque District under USACE Contract No. W912DR-12-D-0006. March.

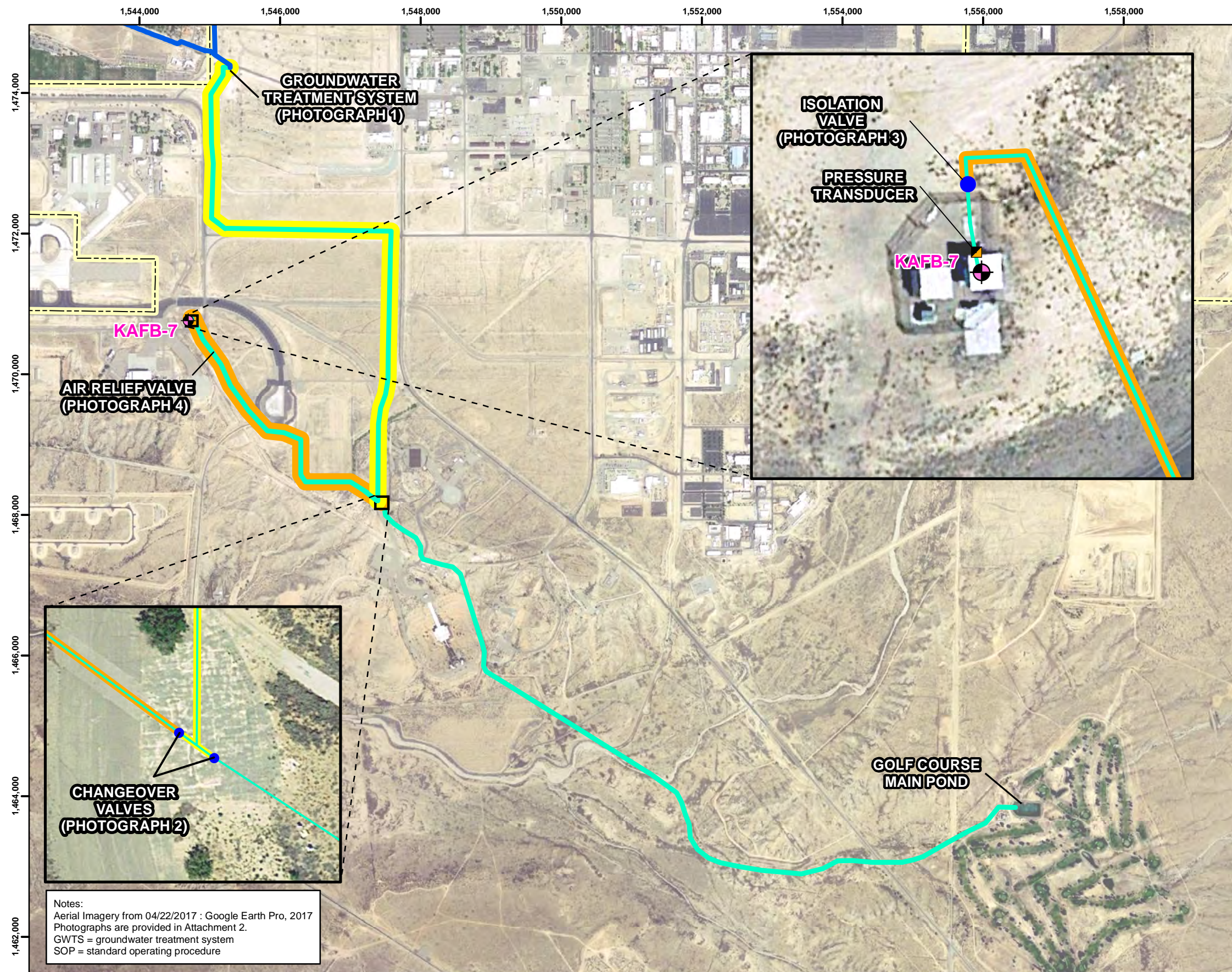
Figures

- 1 Effluent Conveyance Line Test Section and Isolation Valves
- 2 Periodic Hydrostatic Test Readings

Attachments

- 1 Hydrostatic Pressure Testing Forms
- 2 Photographic Log

FIGURES



Legend

- Injection Well
- GWTS Effluent Piping that Completed Testing within SOP Specifications
- GWTS Effluent Piping to be Retested Following Repairs to KAFB-7
- GWTS Effluent Piping
- GWTS Influent Piping
- Installation Boundary

SITE LOCATION

0 750 1,500 3,000 Feet

1 inch = 1,500 feet

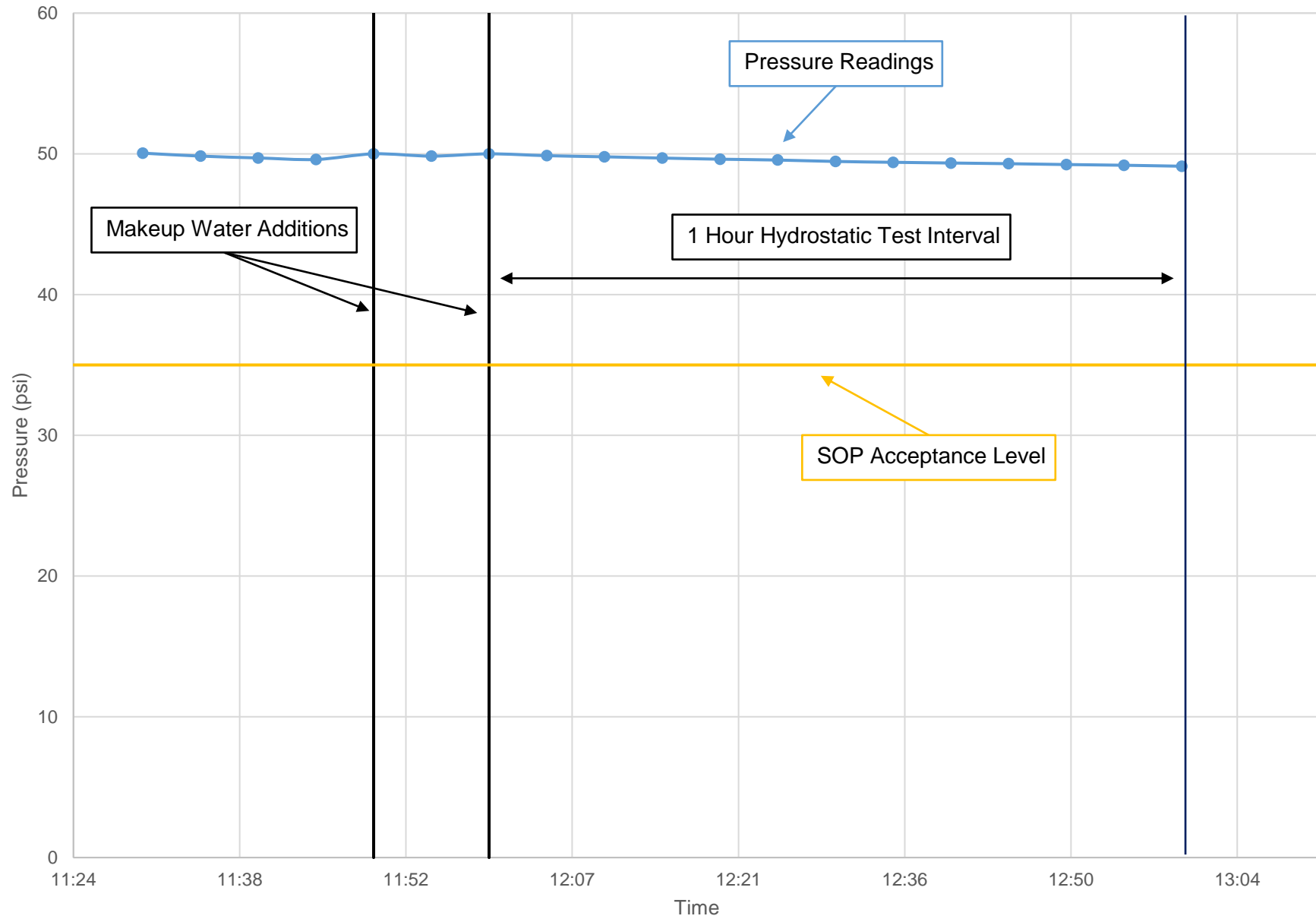
Projection: NAD83 State Plane New Mexico Central FIPS3002 Feet

EFFLUENT LINE INTEGRITY TESTING REPORT
OF THE GROUNDWATER TREATMENT SYSTEM
BULK FUELS FACILITY
SOLID WASTE MANAGEMENT UNIT ST-106/SS-111
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 1

EFFLUENT CONVEYANCE LINE TEST
SECTION AND ISOLATION VALVES

Figure 2. Periodic Hydrostatic Test Readings



ATTACHMENT 1

HYDROSTATIC PRESSURE TESTING FORMS



HYDROSTATIC PRESSURE TESTING FORM

Project: GWTS Effluent Conveyance Line
EA Project No: 62599DM01
Air Temperature: 52°F
Length of Pipe Tested: GWTS to KAFB-7 Iso. Valve
Location of Pipe Tested: Kirtland BFF

Date: 04/04/18
Time: 0930
Type of Pipe Tested: HDPE

Hydrostatic specified test pressure (STP) is recommended at 150 percent (%) of operating pressure per American Society of Mechanical Engineers B31.3 Part 345 and will be measured at gauge PI-3208 on the effluent skid No. 2. The current operating pressure in the effluent conveyance line is approximately 12 pounds per square inch (psi) with a high pressure alarm at 45 psi; thus, an STP of 50 psi has been specified for this test (10% higher than the high pressure alarm set point). The final pressure will be compared to the STP at the end of the test period. ASTM International F2164 – 13 defines a hydrostatic pressure test as acceptable if the final pressure does not deviate by more than 30% from the STP reading (± 15 psi for this test). The results of the hydrostatic test will be included in the test report. Although the ASTM International F2164 – 13 method requires an air volume and rebound assessment for the installation of new, uniform piping, these assessments will not be performed due to the varying pipe thicknesses, types, and age of the pipes that comprise the effluent conveyance line.

Testing Procedure

Piping shall be vented and then brought to the STP and held at the STP by providing successive injections of makeup water. Piping shall then be subjected for 1 hour to a hydrostatic test pressure of 50 psi. No additional makeup water will be added during this period. Exposed pipe, joints, fittings, and valves shall be carefully examined for leaks. Record testing results below and compare the final pressure to the STP.

Testing Results

Initial pressure reading after 30-minute makeup period: NA

Pressure reading after 1 hour: NA

Difference in pressure: NA

Final Pressure within 30% of STP? NA

Are there any leaks present? KAFB-7 isolation valve could not be sealed.

Additional testing comments: Pressure detected downstream of KAFB-7 isolation valve. Test could not be completed.

Signature: Tyler Curley

Testing Operator

4-4-18
Date



HYDROSTATIC PRESSURE TESTING FORM

Project: GWTS Effluent Conveyance Line
EA Project No: 62599DM01
Air Temperature: 59°
Length of Pipe Tested: GWTS to Changeover
Location of Pipe Tested: Kirtland BTF

Date: 04/04/18
Time: 11:30
Type of Pipe Tested: HDPE

Hydrostatic specified test pressure (STP) is recommended at 150 percent (%) of operating pressure per American Society of Mechanical Engineers B31.3 Part 345 and will be measured at gauge PI-3208 on the effluent skid No. 2. The current operating pressure in the effluent conveyance line is approximately 12 pounds per square inch (psi) with a high pressure alarm at 45 psi; thus, an STP of 50 psi has been specified for this test (10% higher than the high pressure alarm set point). The final pressure will be compared to the STP at the end of the test period. ASTM International F2164 – 13 defines a hydrostatic pressure test as acceptable if the final pressure does not deviate by more than 30% from the STP reading (± 15 psi for this test). The results of the hydrostatic test will be included in the test report. Although the ASTM International F2164 – 13 method requires an air volume and rebound assessment for the installation of new, uniform piping, these assessments will not be performed due to the varying pipe thicknesses, types, and age of the pipes that comprise the effluent conveyance line.

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Testing Results

Initial pressure reading after 30-minute makeup period: 50.05^{psi} makeup, 50.00^{psi} initial.

Pressure reading after 1 hour: 49.12^{psi}

Difference in pressure: 0.88^{psi}

Final Pressure within 30% of STP? Yes

Are there any leaks present? None observed

Additional testing comments: None

Signature: Tyler Cunley

Testing Operator

4-4-18
Date

ATTACHMENT 2
PHOTOGRAPHIC LOG



Location: Effluent Pipe Tree at the GWTS (Photograph 1 on Figure 1)
Description: Effluent Pressure Gauge at 13:10 (Post Test)
Date: April 04, 2018

Direction: West



Location: Changeover Valves (Photograph 2 on Figure 1)
Description: Post Indicators for the Changeover Valves
Date: April 04, 2018

Direction: South



Location: KAFB-7 (Photograph 3 on Figure 1)
Description: Newly Installed Isolation Valve
Date: April 04, 2018

Direction: Down



Location: Along Effluent Conveyance Line (Photograph 4 on Figure 1)
Description: Air Relief Valve
Date: April 04, 2018

Direction: Down