

**OFFICE OF THE NEVADA ENVIRONMENTAL RESPONSE TRUST TRUSTEE**

**Le Petomane XXVII, Inc., Not Individually, But Solely as the Nevada Environmental Response Trust Trustee**  
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August 24, 2015

Mr. James Dotchin  
Bureau of Industrial Site Cleanup  
Nevada Division of Environmental Protection  
2030 E. Flamingo Rd, Suite 230  
Las Vegas NV 89119

RE: Secondary Containment Evaluation and Recommendations  
Nevada Environmental Response Trust  
Henderson, Nevada

Dear Mr. Dotchin:

As discussed with the Nevada Division of Environmental Protection Bureau of Industrial Site Cleanup (NDEP-BISC), please find enclosed an evaluation of existing secondary containment structures at the Nevada Environmental Response Trust (NERT or the Trust) Groundwater Extraction and Treatment System facility in Henderson, Nevada. The attached report presents the Trust's recommendations for site improvements focused on expanding secondary containment at vulnerable areas in terms of the likelihood of a potential release.

After a thorough review of the GWETS, including the FBR and chrome treatment plant, all well fields, lift stations and the influent and effluent pipelines, NERT proposes to focus on above ground pipelines and conveyances that contain untreated groundwater as this material poses the greatest potential threat to the environment.

After NDEP has reviewed the attached report, NERT would like to convene a conference call to discuss the recommendations. If NDEP is in agreement with the recommendations, NERT will prepare a budget to design and construct the site improvements.

If you have any questions or concerns regarding this matter, feel to contact me at (702) 686-9611 or at [steve.clough@nert-trust.com](mailto:steve.clough@nert-trust.com).

Office of the Nevada Environmental Response Trust



Stephen R. Clough, P.G., CEM  
Remediation Director  
CEM Certification Number: 2399, exp. 3/24/17

cc: Jay Steinberg, as President of the Nevada Environmental Response Trust Trustee and not individually  
Andrew Steinberg, Le Petomane, Inc.  
Weiquan Dong, NDEP Bureau of Industrial Site Cleanup  
Tanya C. O'Neill, Foley & Lardner LLP



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**To:** Jay Steinberg, Andy Steinberg, Steve Clough (Nevada Environmental Response Trust)

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**Cc:** Derek Amidon, Dan Pastor (Tt)

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**From:** Frank Johns, Caroline Verlander

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**Date:** August 24, 2015

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**Subject:** NERT – GWETS Piping Secondary Containment

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Envirogen Technologies, Inc. (ETI) prepared and submitted a report entitled, “Review of Above Ground Piping Outside Secondary Containment,” dated June 2015 (attached), for the Nevada Environmental Response Trust (Trust). That report identifies piping that is part of the Ground Water Extraction and Treatment System (GWETS) that is neither located within a secondary containment area nor is a double containment piping system. The Trust requested that Tetra Tech review this report and provide comments and recommendations for addressing piping outside of secondary containment. This memorandum provides our recommendations from that review and further evaluation.

Note that this report is only for the GWETS piping. Therefore, piping and infrastructure associated with AP-5 and the solids removal project are not discussed. The piping, tanks, and equipment associated with that project will be designed with adequate secondary containment.

## **Recommendations**

The ETI report is a high-level summary of the results of ETI’s review of piping located outside of secondary containment. Although not mentioned, it should be noted that there are no double-contained piping systems as a part of the GWETS. Therefore, a leak from any piping located outside of a secondary containment area is not contained. The report also only addresses above ground piping. It should be noted that no buried piping has containment. Tetra Tech identified pipes outside of containment areas and prepared a list of these pipes, including the pipe size, location, and contents, in Table 1.

The goal of this report was to identify pipes containing elevated levels of perchlorate or other potentially hazardous compounds that could adversely impact human health and the environment. Therefore, groundwater that has been treated biologically to remove perchlorate is not considered as significant a concern as untreated groundwater. Tetra Tech has considered partially treated water as any water after the second-stage fluidized bed reactors (FBRs), which does not contain detectable levels of perchlorate. Biological solids (sludge) also do not contain levels of perchlorate at concentrations of concern. As noted in Table 1, piping carrying treated water, partially treated, or sludge is not recommended for secondary containment, except in cases where the piping is located adjacent to other pipes that are recommended for containment.

In our analysis, piping sections that consist of continuous pipe lengths or welded pipe joints are a lower priority than pipe sections that include threaded joints and flanges. This criterion was used to cost effectively determine the higher priority pipe sections to consider for secondary containment.

Tetra Tech has the following recommendations by location as designated in the ETI report.

### **On-Site Perchlorate Treatment Systems**

- The Equalization Area (EQ Area) has two types of raw water pipelines: one 4-inch pipe from the GWTP and several 12-inch pipes from the well fields, from the GW-11, and from the GAC effluent. Tetra Tech recommends extending the containment pad at the EQ Area around the raw water pipe, installing a concrete curb, and coring openings into the existing containment area. If raw water is spilled, then it will flow towards the existing sump in the EQ area. By installing this new containment pad and curb, treated water in the area will also be contained.
- Tetra Tech also recommends installing a HDPE liner underneath the raw water pipe installed on the slope under the bridge to GW-11. With this liner in place, any spilled raw water would flow towards the EQ Area and new containment pad and then to the existing containment area where a sump is already installed.
- On the east side of the D-1 Building, there is one 8-inch raw water pipe. Tetra Tech recommends installing a concrete or asphalt berm and, potentially, installing trench drains in this area. If raw water is spilled, it would be collected and moved to the sumps in the D-1 building or a new sump located north of the D-1 building. By installing this new containment system, treated water in the area will also be contained.
- The five pump pads located on the north and south side of the FBR pad each contain 10-inch raw water piping. Tetra Tech recommends installing a concrete curb around each pump pad that will connect into the existing sumps within the FBR pad in the event raw water might spill.
- Two pipes carrying raw water between the FBR pad and the D-1 building have been identified: a 3-inch sump discharge pipe (can contain raw water in the event of a spill) and a 10-inch raw water pipe. Tetra Tech recommends installing an asphalt berm and trench drains that would direct flow to a new containment sump constructed north of the D-1 building. The DAF discharge and feed piping and the sludge piping outside of the FBR containment pad in the area between the FBR pad and D-1 building is partially treated water and will not contain detectable concentrations of perchlorate, but a portion will be included within the containment for piping between the FBR pad and the D-1 building.
- The ethanol piping from the FBR pad is not recommended for containment because there are only welded joints present.

### **Off-Site Well Fields and Lift Stations**

- Lift Station 1 has multiple raw water pipelines: eight 2-inch pipelines from the extraction wells; and one 6-inch raw water pipeline to Lift Station 2. The extraction well piping will be modified during the

planned IX installation and containment will be added. The 6-inch raw water pipeline will have a HDPE containment liner installed during the IX installation as well.

- Lift Station 2 has a single 6-inch, above ground raw water pipeline. This pipe is the discharge from the higher capacity vertical turbine pump. There are plans to replace the lower capacity submersible pump. It is recommended that the raw water piping be rerouted and containment added during the pump replacement project.
- Lift Station 3 does not have above ground piping needing secondary containment.

### **On-Site Ground Water Treatment Plant (GWTP or Chrome Plant)**

- The GWTP is located on a concrete pad with continuous curbs, except on a portion of the south side for access to the filter press and at the southwest corner near a control panel. It is recommended that a trench drain be added to the open area on the south and be piped to the existing sump. An evaluation will be made to determine if a curb section can be added to the southwest corner or a trench drain is required in that area as well.
- The section of 4-inch HDPE piping located just north of the GWTP that runs from the GWTP to the EQ Area will not need secondary containment because there are only thermally welded joints present in this section of pipe.
- The ferrous sulfate feed from two locations (storage tank and temporary tote) will not require secondary containment because there are no joints outside of the containment areas.

### **On-Site Well Field**

- The 30 extraction wells in the interceptor well field (IWF) wells each have sections of above ground, 1-inch galvanized steel pipe that contains threaded joints. Although this is raw water piping and has threaded joints, the cost for installing 30 separate containment pads is significant and will be difficult to monitor and pump out after rain events. In addition, this piping is being reworked as part of the Enhanced Operational Metrics project, so there will be new installations. Therefore, Tetra Tech recommends that no action be taken since the above ground well discharge piping will be inspected on a regular basis.

**Table 1 - Piping Outside of Secondary Containment**

**On-Site Perchlorate Treatment System**

<u>Location</u>	<u>Contents</u>	<u>Size (in.)</u>	<u>Length (ft.)</u>	<u>Material</u>	<u>Action Required</u>
Equilization (EQ) Area	Raw Water	4, 12	35	CPVC	Concrete containment and HDPE liner
Equilization (EQ) Area	Treated Water	8, 10	35	CPVC	None, but will be included with raw water.
Piping on East Side of the D-1 Building	Raw Water	8	50	CPVC	Concrete curb/asphalt berm
Piping on East Side of the D-1 Building	Treated Water	8, 10	50	CPVC	None, but will be included with raw water.
Piping between the FBR pad and the D-1 Building	Raw Water	3 (sump discharge), 10	25	CPVC	Asphalt berm and trench drains to new containment sump to the north of D-1 building.
Piping between the FBR pad and the D-1 Building	Partially Treated Water	2 (filtrate), 8	25	CPVC	None, but will be included with raw water.
Piping between the FBR pad and the D-1 Building	Sludge	3	25	CPVC	None, but will be included with raw water.
FBR Recirculation Pump Skid Piping - North (1st stage - 3 skids) and South (2nd stage - 2 skids)	Raw Water	10	40	CPVC	Concrete curb that will connect into the existing sumps within the FBR pad.
DAF Feed Piping Outside of FBR Containment Pad	Partially Treated Water	14	25	CPVC	None, but a portion will be included with containment for piping between FBR pad and the D-1 building.
DAF Discharge Piping Outside of FBR Containment Pad	Partially Treated Water	10	125	CPVC	None, but will be included with containment for piping between FBR pad and the D-1 building.
Ethanol Piping from the FBR Pad	Ethanol	1/2 (8 pipes total)	25	SS	None because there are only welded joints present.

**Off-Site Well Fields and Lift Stations**

<u>Location</u>	<u>Contents</u>	<u>Size (in.)</u>	<u>Length (ft.)</u>	<u>Material</u>	
<u>Lift Station No. 1</u>					
Extraction Well Piping to Lift Station No. 1	Raw Water	2	50	Steel	Piping will be modified during planned IX installation and containment will added.
Raw Water to Lift Station No. 2	Raw Water	6	25	Steel	HDPE containment liner will be added during IX installation.
Effluent Pipe to LVW-above ground section in LS1 with valves from pig catching	Treated Water	12	20	HDPE	None
<u>Lift Station No. 2</u>					
Raw Water to Lift Station No. 2	Raw Water	6	20	Steel	Piping will be rerouted and containment added during pump replacement.
<u>Lift Station No. 3</u> (No above ground piping)					

**On-Site Ground Water Treatment Plant and IWF Well**

<u>Location</u>	<u>Contents</u>	<u>Size (in.)</u>	<u>Length (ft.)</u>	<u>Material</u>	
<u>GWTP</u>					
GWTP pad containment	Raw water	N/A	N/A	N/A	Open area in curb on south side of containment pad. Add trench drain.
Surface piping from GWTP to EQ Area	Treated water	3	200	HDPE	None because there are only welded joints present.
Ferrous sulfate feed-from 2 locations, storage tank and temporary tote	Ferrous Sulfate	1/2	20	PE Tubing	None because there are no joints outside of the containment areas.
<u>IWF</u>					
Surface piping at typical extraction well-30 locations	Raw Water	1	10	GSP	Containment not economically feasible. Well piping above ground will be inspected on a regular basis.



1373-REP-002

Rev 0

## Review of Above Ground Piping Outside Secondary Containment

SITE:

NERT

Henderson, Nevada

PREPARED BY:

Envirogen Technologies  
250 Phillips Boulevard, Suite 255  
Ewing, NJ 08618

## Introduction

As one of the preventive and/ or corrective actions to be taken following the report of a treated water spill at the NERT Henderson, NV site on May 7, 2015 (Incident No, 150507-02), Envirogen Technologies has prepared this review to identify piping that is not located within the confines of secondary containment for equipment on the site. A failure of such piping could result in an uncontained spill similar to that of the subject report.

The review is divided into three major areas of concern;

- The on-site perchlorate treatment system
- The off-site well fields and lift stations
- The on-site Ground Water Extraction Treatment System (GWETS or Chrome Plant)

Photographs and plant construction drawings have been included to assist in identifying the piping in question.

## On-site Perchlorate Treatment System (Figure 1)

Items not further identified are the chemical drum and tote storage area, shown as item 8, and the AMPAC sludge storage tank, shown as item 7. Both the entire chemical storage area and the piping from the sludge storage tank are not contained.

### Figure 2: Equalization Area

Identifies piping outside the EQ containment pad and on the GW-11 containment berm. The EQ pad is contained and its sump pumps to GW-11.

### Figure 3: Piping on East side of building D-1

Identifies piping to and from the sand filter as well as raw and treated water to and from building D-1. The Raw Water filters are contained and the sump pumps to the D-1 sump.

### Figure 4: Piping on West side of building D-1

Identifies piping on the pipe bridge between building D-1 and the FBR area as well as piping outside the FBR containment pad.  
Building D-1 is contained and its sump pumps to GW-11.

### Figure 5: Identifies DAF feed and discharge piping outside the FBR area containment pad.

Figure 6: Identifies piping outside the FBR containment pad, including ethanol feed tubing and ethanol circulating piping on the ethanol tank. The ethanol tank is double wall construction. The FBR equipment pad is contained and pumps to the D-1 sump.

## Off-site Well Fields and Lift Stations (Figure 7)

### Figure 8: Lift Station No. 1.

Nine (9) raw water seep wells (not shown) surface with flow meter runs to Lift station 1 wet well. Discharge pumps and piping on the wet well are uncontained. Discharge continues to Lift Station No. 2. Treated water from the plant surfaces for pig recovery before continuing to the wash. Other currently unused piping remains in place.

Figure 9: Identifies surface piping at Lift Station No. 2. Discharge continues to the treatment plant.



Figure 10: Identifies surface piping at Lift Station No. 3. Athens Road Wells (not shown) pump to this wet well. Discharge continues to Lift Station No. 2.

### **On-site Ground Water Extraction Treatment System (Figure 11)**

Figure 12: Identifies surface piping at GWETS and typical extraction well locations.

Figure 13: Identifies surface piping at typical extraction well.

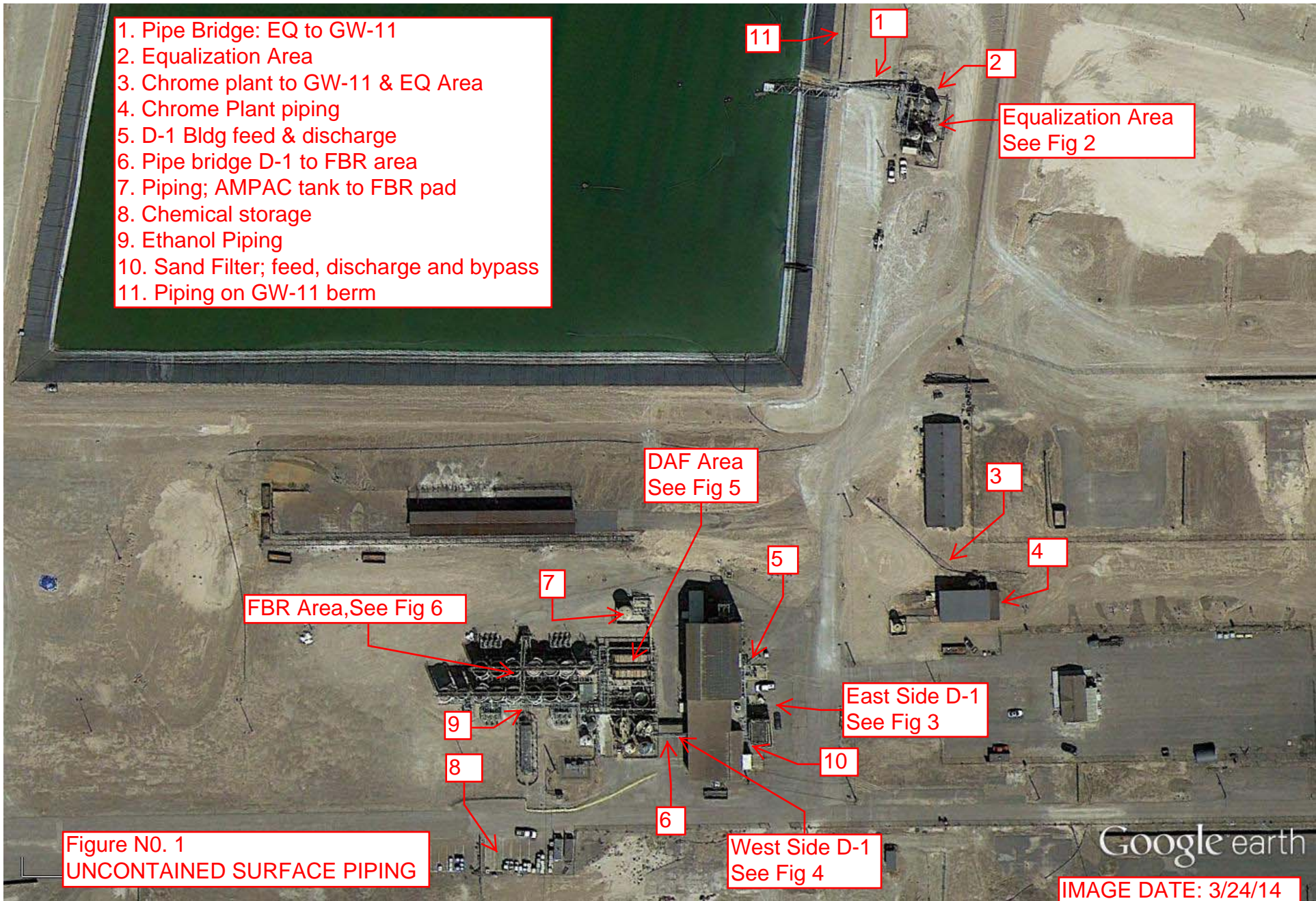
### **Original Design Parameters**

It should be noted here that the original plant design and subsequent modifications were never intended to COMPLETELY contain all plant equipment, piping and storage. Rather the design was such that the large tanks reside on containment pads which can contain a spill of the contents of the largest tank.

The chrome treatment plant predates even this design parameter and is on a pad with a spill sump but the pad is uncontained.

Lastly, it should also be noted that all underground piping both on and offsite are uncontained. With individual well lines, this could be in excess of 15+ miles of underground piping. Along the lines from and to the lift stations are numerous air and vacuum release valves which are uncontained.

This report is intended to be the starting basis for discussion with the Trust and its consultants, for any possible modifications to either, operating/inspection procedures or physical plant changes that may better protect the facility from spills and containment.



Contained Area

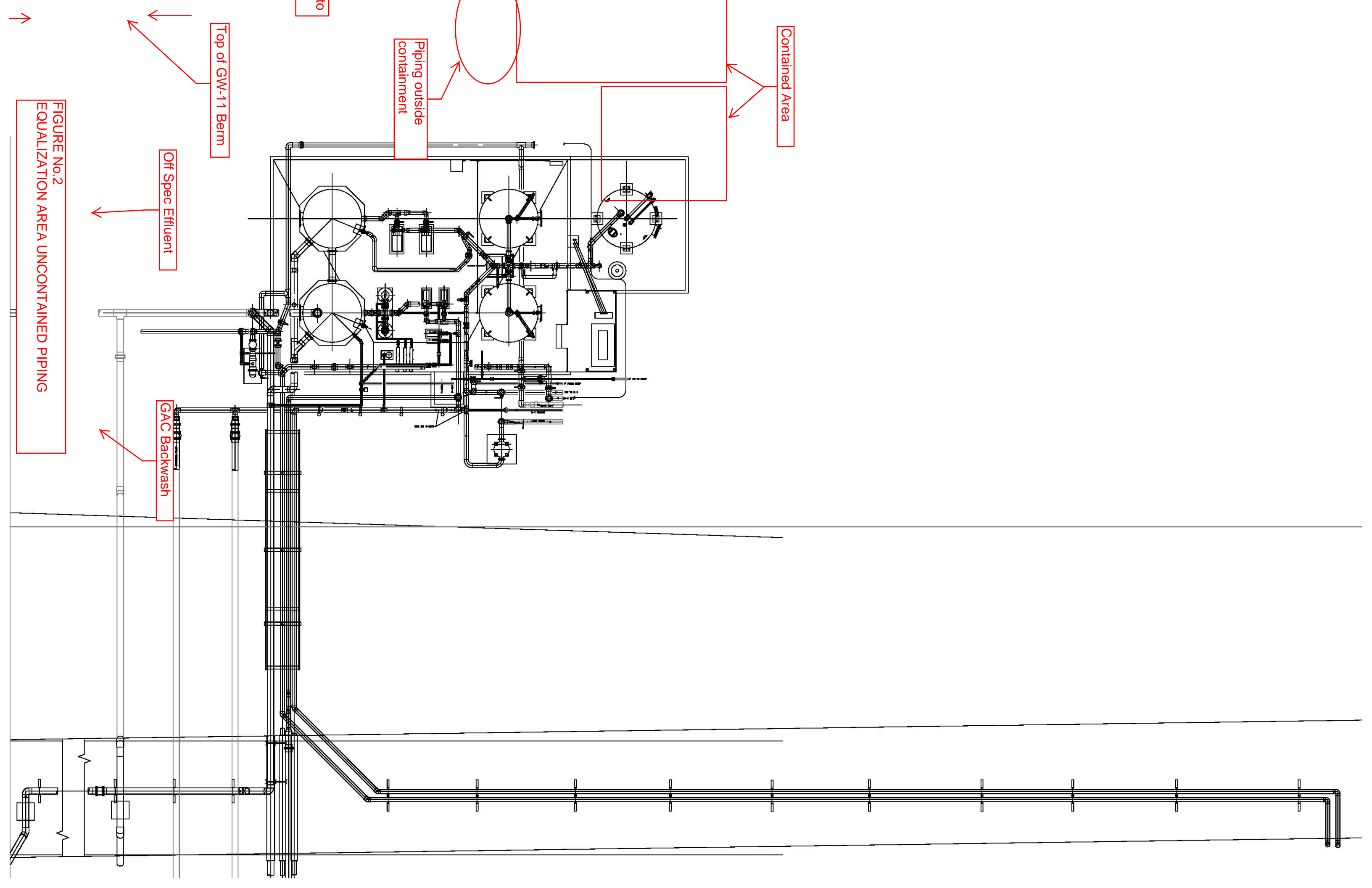
Piping outside containment

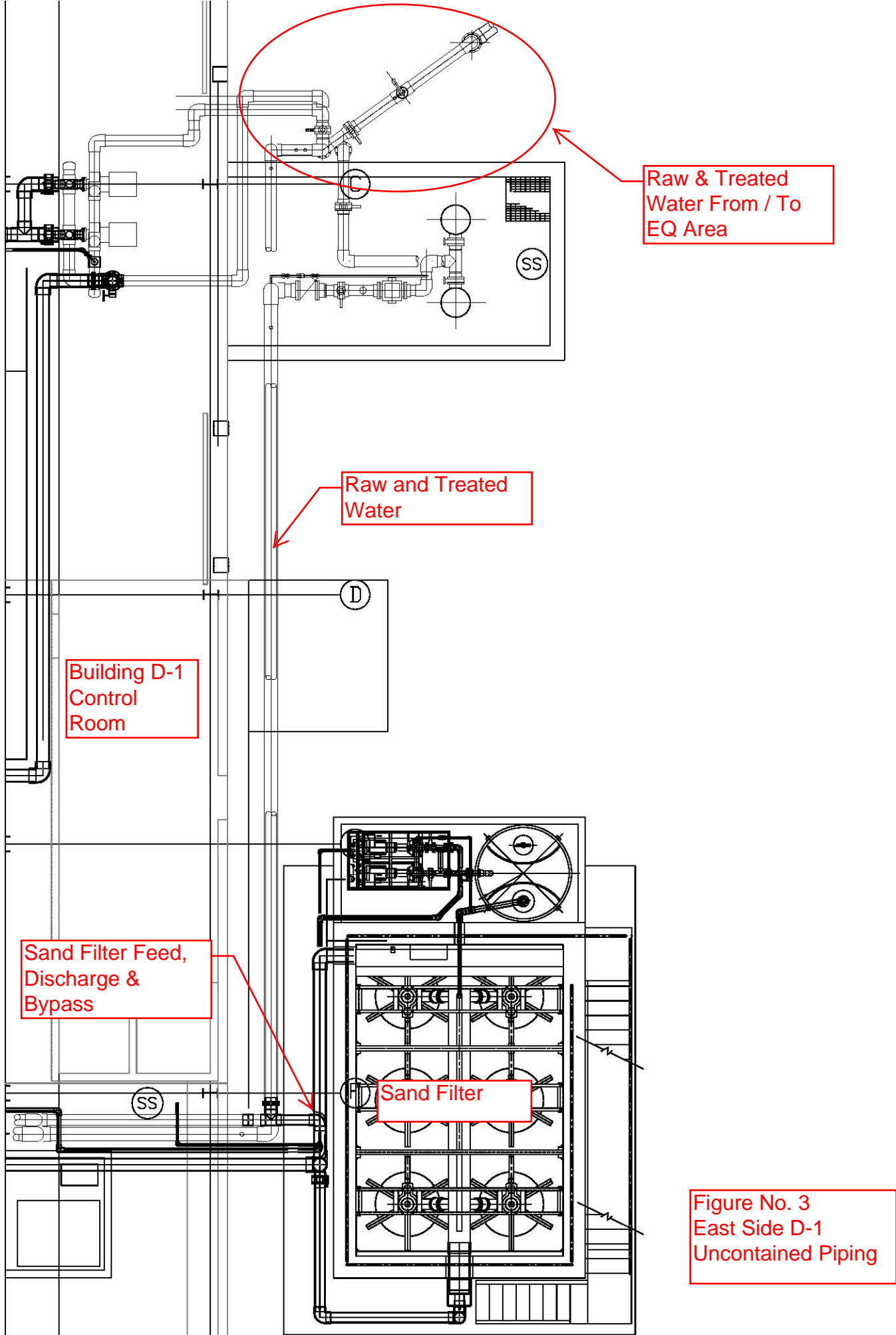
Top of GW-11 Berm

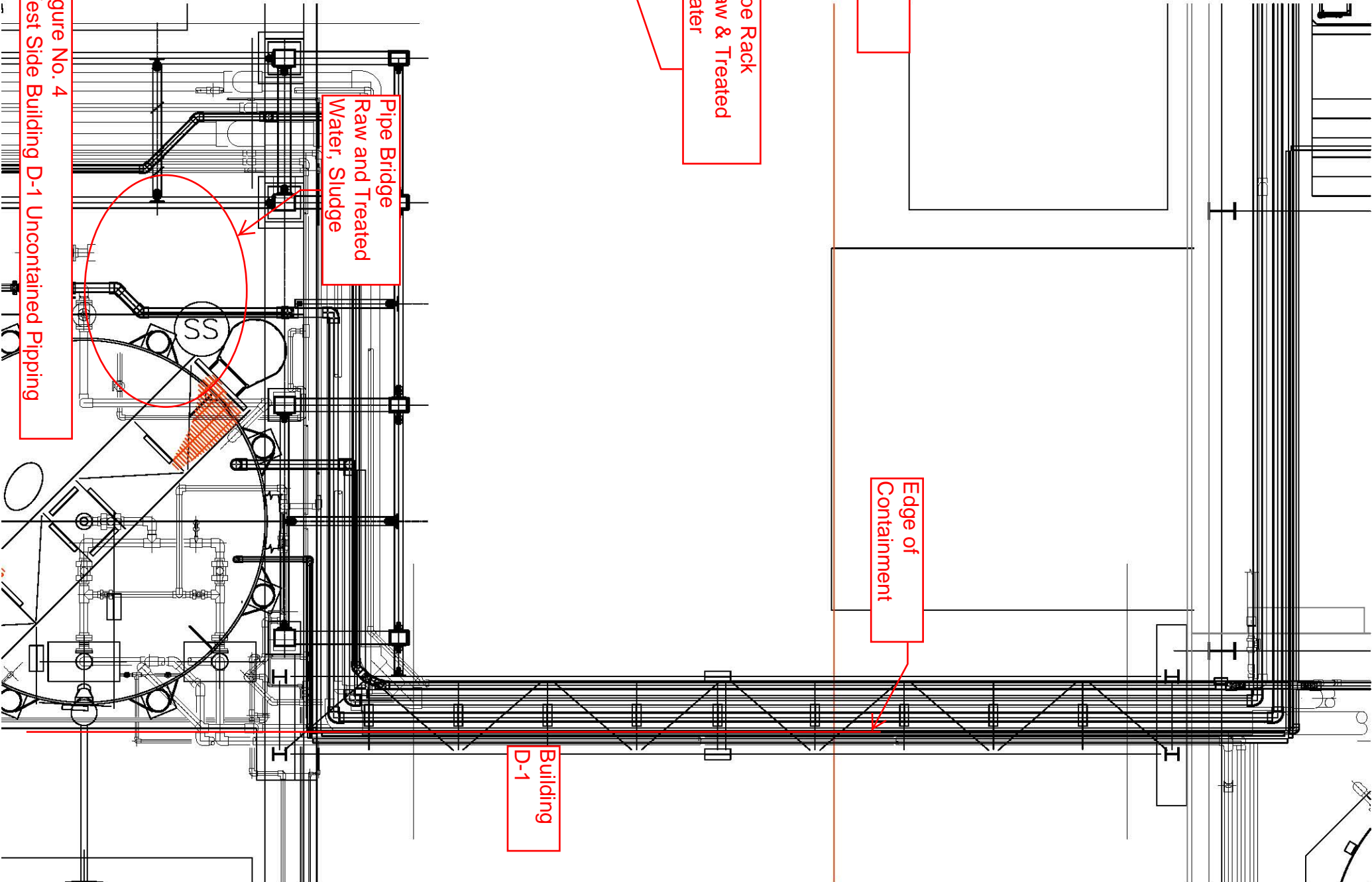
Off Spec Effluent

GAC Backwash

FIGURE No.2  
EQUALIZATION AREA UNCONTAINED PIPING







Edge of Containment

Pipe Rack  
Raw & Treated  
Water

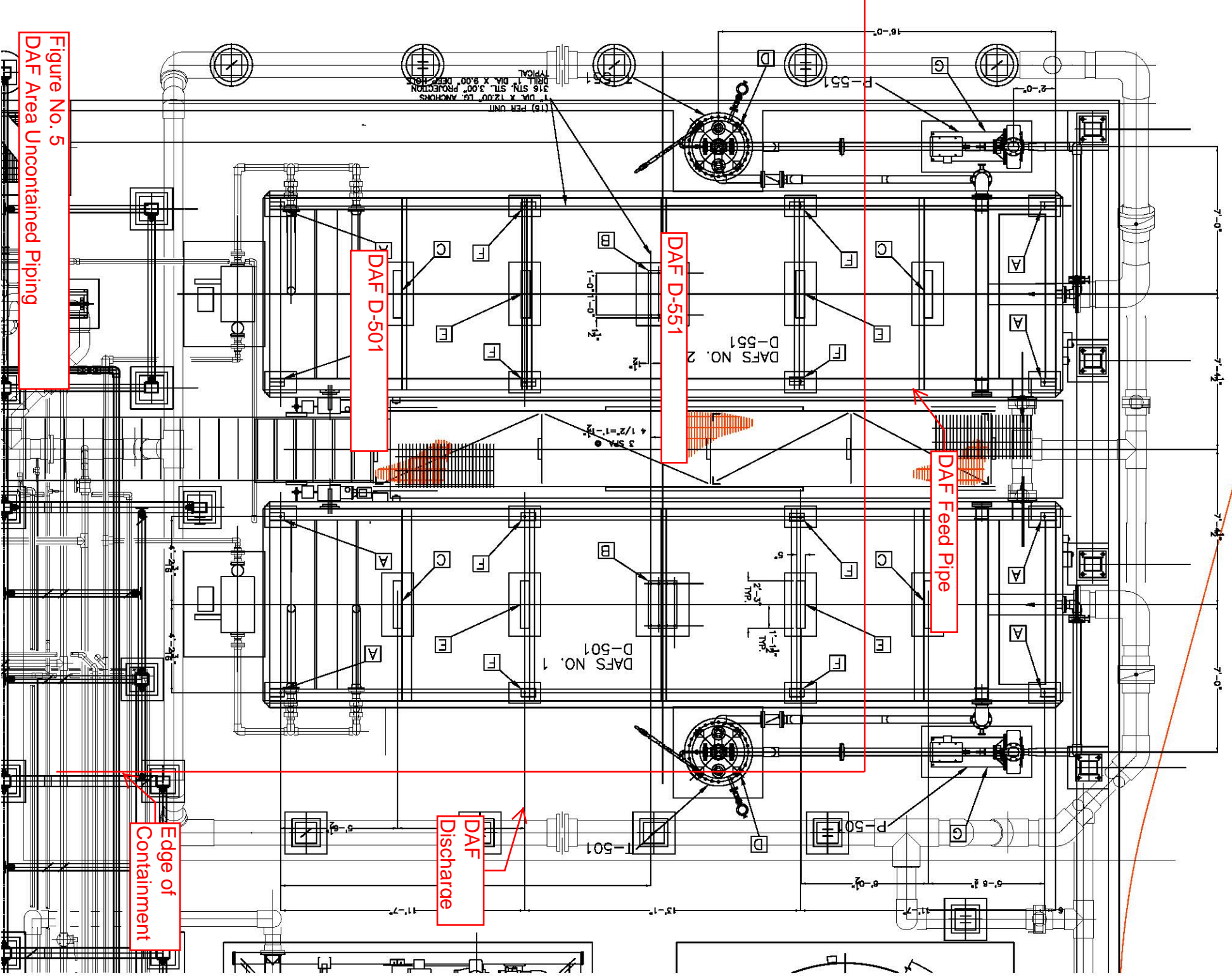
Pipe Bridge  
Raw and Treated  
Water, Sludge

Edge of Containment

Building  
D-1

Figure No. 4  
West Side Building D-1 Uncontained Piping

Figure No. 5  
DAF Area Uncontained Piping

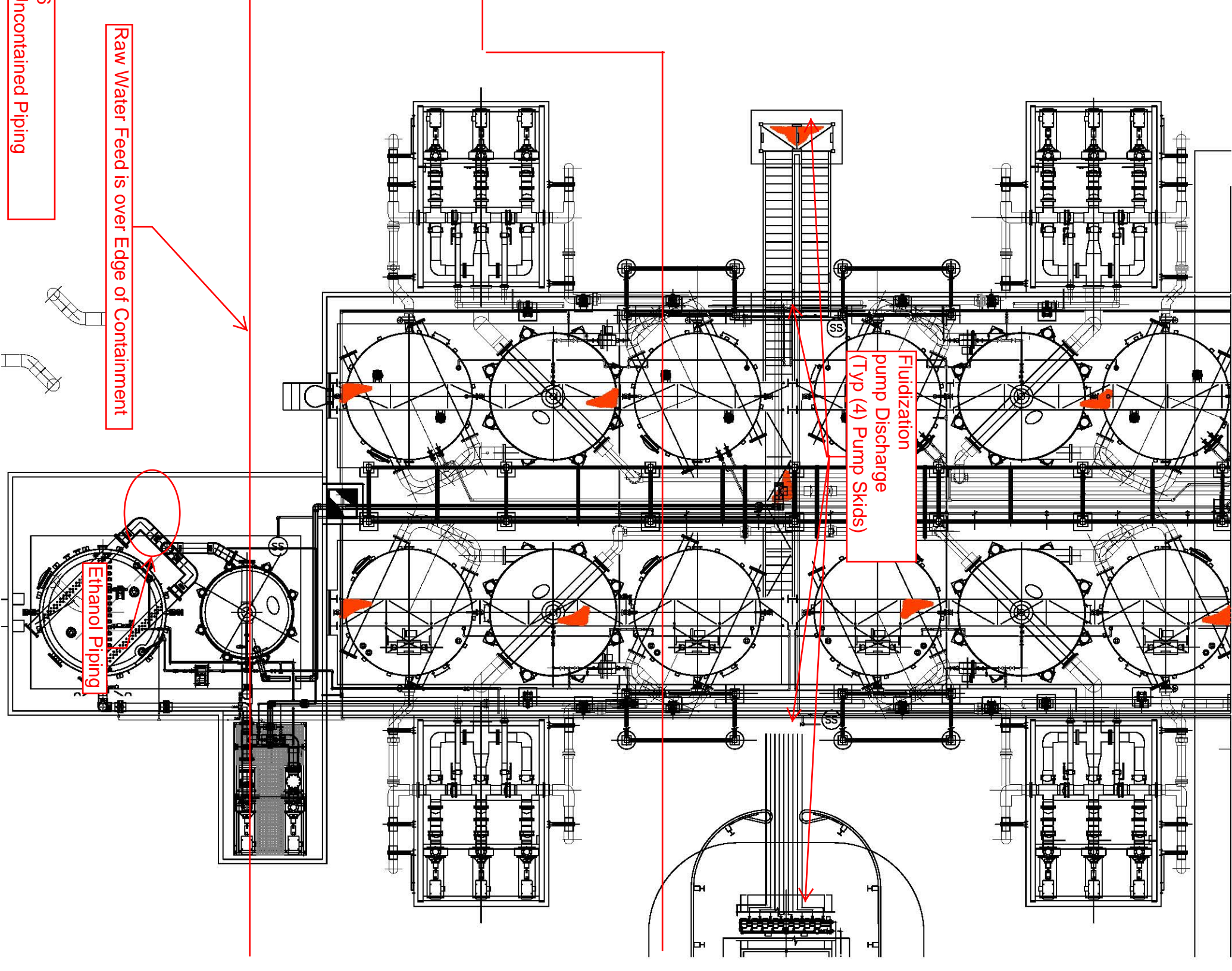


Incontained Piping

Raw Water Feed is over Edge of Containment

Ethanol Piping

Fluidization  
pump Discharge  
(Typ (4) Pump Skids)



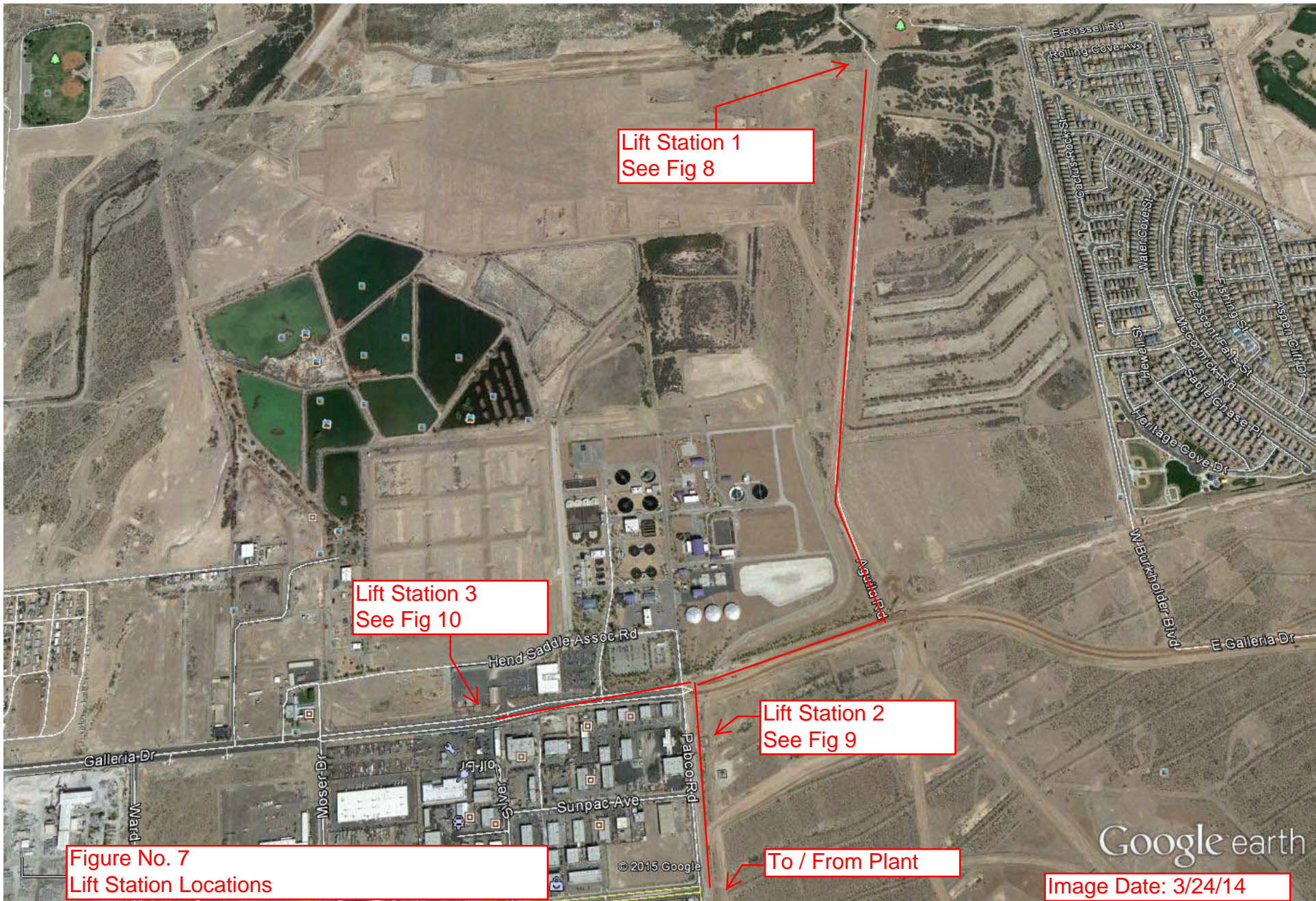






Figure No. 8  
Lift Station No. 1

Image Date: 3/24/14





Figure No. 9  
Lift Station No. 2

Image Date: 3/24/14

Google earth





Lift Station No. 3

Figure No. 10  
Lift Station No. 3

Google earth  
Image Date: 3/24/14

Google earth





Ground Water Plant  
See Figure 12

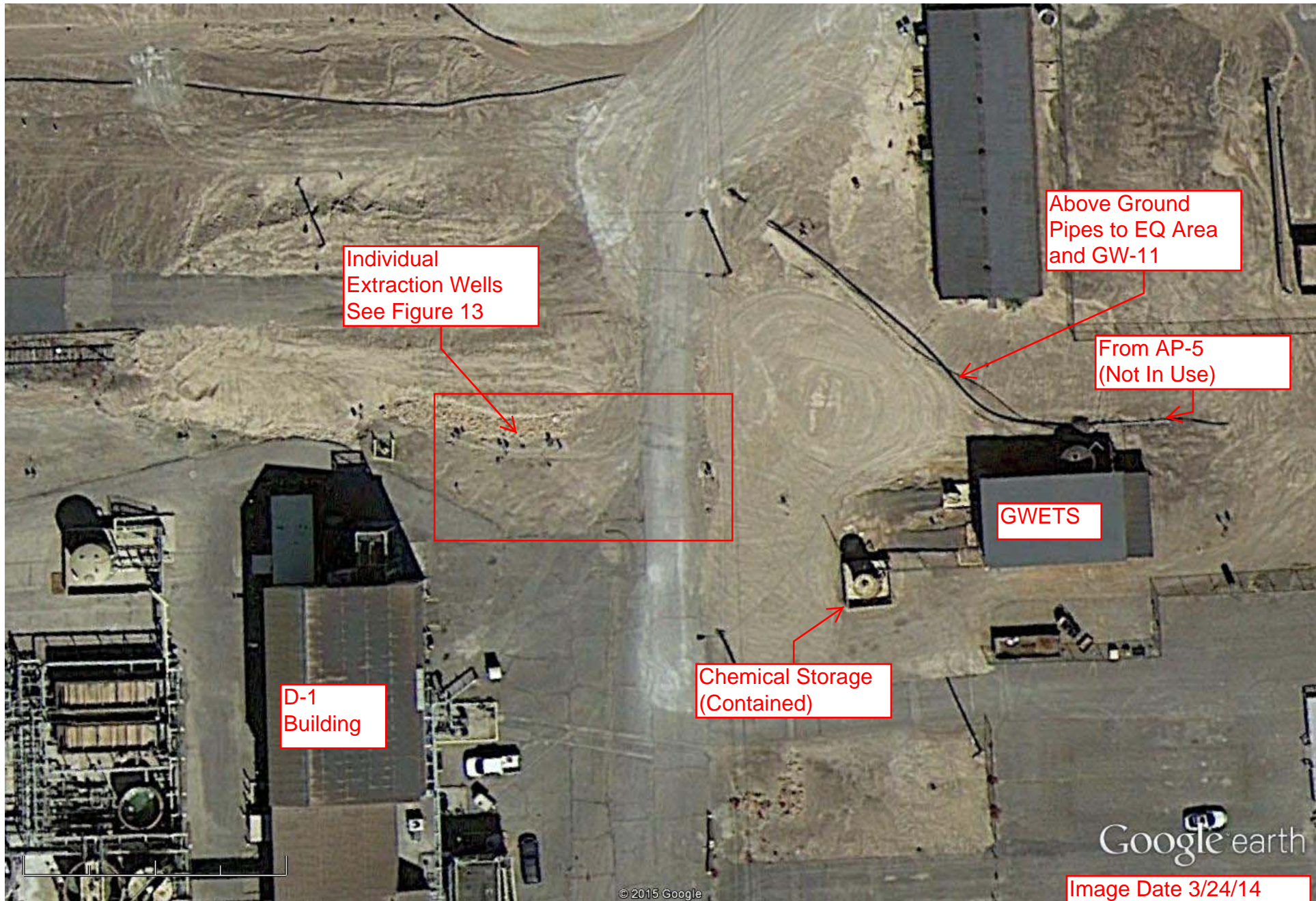
Figure 11  
Ground Water Extraction Well Field

**Legend**

- ◆ Extraction Wells
- Influent/Effluent Pipelines
  - At Ground Surface
  - - - - - Underground

Pipeline locations are obtained from design drawings and from discussions with onsite personnel and are adjusted based on the relative locations of known facilities. Locations are approximate and are not to be used for construction.





Google earth



Figure 12  
Ground Water Treatment Plant





EQ Area

I-L

Typical Discharge  
Pipe Above Ground

I-Y

GW-11

I-R

Figure 13  
Individual Extraction Wells