

## TECHNICAL MEMORANDUM

**TO:** Taylor Weavil  
Board President  
Sugar House Park Authority  
6332 S Airport Road  
West Jordan, UT 84084

**FROM:** Rebecca Brown, PG, Senior Hydrogeologist

**DATE:** 6 April 2022

**SUBJECT:** Review of Environmental Concerns  
Proposed Kum & Go Gas Station  
2111 South 1300 East  
Salt Lake City, Utah

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### 1. Introduction

This Technical Memorandum has been prepared at the request of the Sugar House Park Authority Board (the “Board”) to review the Galloway US proposal for a Kum & Go Gas Station (the “Gas Station”) to be located on the northwest corner of the Sugar House Park block, 2111 South 1300 East in Salt Lake City, Utah (the “Property”) (Figure 1). The Board is seeking an opinion as to the potential for environmental impacts to human health or the environment at the Sugar House Park property (“Park”) from the proposed Gas Station development.

This assessment has included a review of the following publicly available documents:

- Historic topographic maps, aerial photographs, Sanborn Fire Insurance Maps, and historical information from the Sugar House Park Authority were reviewed to gain insight into the current and historical uses of the Park and the northwest corner Property.
  - Environmental records from the Utah Department of Environmental Quality (UDEQ) Division of Environmental Response and Remediation (DERR) pertaining to current and historical releases of contaminants into the environment from facilities on, or in the immediate vicinity of the Park and the northwest corner Property.
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- Hydrogeological information available from the UDEQ Division of Water Quality (DWQ), the Utah Department of Natural Resources (DNR) Division of Water Rights (DWR) and Division of Drinking Water (DDW), the US Geological Survey (USGS), and the Utah Geological Survey (UGS) to gain insight into the hydrogeological conditions which govern the fate and transport of potential contaminant releases from the proposed Gas Station.
- Environmental regulations governing the installation, operation, and monitoring of underground storage tanks (USTs) associated with gas station operations (DERR)
- Environmental regulations governing gasoline vapor emissions during transfer and storage operations per the UDEQ Division of Air Quality (DAQ).

## **2. Historical Use of Properties**

A brief review of historical uses of the Sugar House Park property and the northwest corner Property was done to assess the potential for existing impacts to soil or groundwater from historical activities on these properties, and to gain an understanding of the fate and transport of contaminant releases from nearby facilities.

### **2.1. Historical Maps and Aerials Review**

Historically, from 1854 through 1951, the Park property was used to house a penal institution. The location of the prison and supporting structures are depicted on the 1911 Sanborn Fire Insurance Map and the 1950 Sanborn Map, included as Figures 2 and 6 to this memo, respectively.

It appears that the northwest corner Property has been used for residential and commercial purposes not associated with the prison facility since at least 1911. Three residences are depicted on a 1911 Sanborn Map for this Property (Figure 3). An aerial photograph from 1938 (Figure 4) shows that those residences were replaced by one larger building, which is identified as a restaurant on a 1943 Sanborn Map (Figure 5). A small residence and several out-buildings also occupy the southern third of the Property in 1943, as well as a gas station on the far northwest corner of the Property. A 1950 Sanborn Map (Figure 7) depicts a new building, identified as a store, occupying the Property, in addition to the restaurant, residence, and gas station identified in 1943. These structures are also identified in an aerial photograph from 1962 (Figure 8).

Upon review of aerial photographs from 1973 (Figure 9), 1979 (Figure 10), and 1985 (Figure 11), the gas station appears to have been in operation on the northwest corner Property until sometime between 1979 and 1985. The restaurant and residence identified in 1943 had

been removed from the Property by 1962, and the store identified in 1950 had been replaced by a new building in 1973. This building is consistent with the former Sizzler restaurant that occupies the Property today.

## **2.2. Environmental Database Records**

A search for current and historical environmental records for the Park property, the northwest corner Property, and properties in the immediate vicinity was conducted using the Utah Environmental Interactive Map (<https://enviro.deq.utah.gov/>).

### **2.2.1. Sugar House Park Property**

Review of publicly available documents from UDEQ indicate that two USTs were formerly in use at the maintenance facility in the southwest corner of the Park. One 2,000-gallon gasoline UST and one 500-gallon diesel UST were reportedly installed around 1970. Both USTs were removed in January 1998. Upon removal it was discovered that the diesel UST and underground piping had failed, releasing diesel fuel into the subsurface soils, which were excavated down to 10 feet below ground surface when the tanks were removed. Low levels of diesel products remained in soil below 10 feet, but at concentrations that DERR determined did not pose a risk to human health or the environment, given the land use of the property. The groundwater table was estimated to be greater than 12 feet below ground surface, and no impacts to groundwater were identified at the time of the release. This site received regulatory closure in 1999.

A groundwater tetrachloroethene (PCE) groundwater plume has been detected in the deep drinking water aquifer beneath Sugar House Park. Contaminated groundwater has been detected in the Sugar House Park Municipal well, located in the southern portion of the park, since the late 1980s. Concentrations of PCE as high as 25 parts per billion (ppb) have been detected, which exceeds the drinking water Maximum Contaminant Level (MCL) of 5 ppb. The Sugar House Municipal well was shut down shortly after discovering the PCE in 1988. Elevated PCE concentrations were also found in soil and soil gas samples from locations upgradient of the Sugar House Park plume and in sediment samples collected from Parley's Creek downstream from the plume site. Despite numerous investigations into various nearby and upgradient dry cleaner locations, LUST sites, and other EPA sites, the source of this contamination has not been identified, but is not thought to have originated on the Sugar House Park property. The presence of plume beneath Sugar House Park does not present a risk to human health or the environment for users of the park property, and water collected in the Sugar House Pond is not impacted.

### **2.2.2. Northwest Corner Property**

Based on our review of historical maps and aerial photographs, a gas station likely operated on this property from approximately 1943 through 1979. No records of this gas station were found in the publicly available documents from UDEQ, likely because the US EPA did not begin regulation of USTs until 1988. There is a good chance that the USTs associated with this gas station are still in place on the Property, and that impacts to soil, and possibly even groundwater, will be found if excavation were to take place on the northwest corner of the Property.

### **2.2.3. Nearby Properties**

The Chevron gas station located to the west Sugar House Park, across 1300 East, has operated at least since the late 1980s, when new USTs were installed. Review of public records from UDEQ DERR indicates that the facility has maintained its Certificate of Compliance (see Section 4.1) and has had no significant releases of petroleum products to the environment. One minor leak was discovered around a dispenser in 2005 when dispenser lines were being repaired, but the impacted soil was removed, and the facility received No Further Action status from DERR. Groundwater was not impacted by this release.

There have been several other releases from historical gas stations in the Sugar House neighborhood. A review of DERR records indicates that a majority of these releases have been remediated, and that these releases were limited to surface and subsurface soils, and groundwater was not impacted.

## **3. Hydrogeology**

The Park property and northwest corner Property are located on the east bench of Salt Lake City on the southeast corner of 1300 East and 2100 South. Parley's Creek flows westward through the Park and empties into Sugar House Pond on the western side of the Park. The pond serves as a flood detention structure for Parley's Creek, controlled by a flood control spillway and hydraulically operated headgate at 1300 East. The detention basin can store up to 80 acre-feet of stormwater and is often the first line of defense for the City to control and manage flood flows through the City's drainage system. Parley's Creek then flows beneath 1300 East, surfacing briefly in Hidden Hollow Park, and eventually discharges 3.5 miles downstream into the Jordan River.

Shallow groundwater in the vicinity of the Park is located between 15 and 20 feet below ground surface, or more, and flows in a southwesterly direction. Surface water that collects in Sugar House Pond is not hydraulically connected to groundwater in the vicinity of the Park.

### **3.1. Groundwater Recharge Zones**

The primary recharge areas for the principal drinking water aquifer for Salt Lake City are along the mountain fronts on the eastern and, to a lesser degree, western sides of the Salt Lake Valley, as depicted on Figure 12. In these areas, the principal aquifer is unconfined and generally few fine-grained deposits are present to impede the downward movement of water from the land surface to the principal aquifer. Contaminants in these areas generally could move directly, and locally rapidly, to the aquifer. In secondary recharge areas, downgradient from the primary areas, confining beds are present, but the hydraulic gradient is downward from the shallow unconfined aquifer to the principal aquifer. In these areas, contaminants could move from the land surface to the principal aquifer, but movement would be impeded by the confining beds.

The Park and northwest corner Property are located within the secondary recharge zone for the Salt Lake Valley. There are several springs and artesian wells downgradient, to the west, of the Park, in the Salt Lake Valley discharge zone, but according to DWR records, these wells are not currently being used as public or private drinking water sources.

## **4. Air Quality Issues at Gas Stations**

Despite vapor control system requirements for fuel transfer activities, gasoline vapor emissions are still prevalent at gas stations. A recent 2018 study by the Columbia Mailman School of Public Health estimated that 1.4 to 1.7 pounds of liquid gasoline were lost through evaporation for every 1,000 gallons of gasoline dispensed (*Vent Pipe Emissions from Storage Tanks at Gas Stations: Implications for Setback Distances*, Science of the Total Environment 650 (2019) 2239-2250). Many communities around the world have begun to establish setback distance regulations that determine how close schools, playgrounds, and parks can be to gas dispensing facilities. Although Salt Lake City currently has no setback distance requirements for gas stations, there is a unique situation that should be considered with respect to the proposed Kum & Go Gas Station.

Gasoline vapors are three to four times denser than air, meaning that gasoline vapors emitted from any fuel dispensing operations will tend to sink and collect on the ground, and are well known to travel in a fluid-like manner along the ground to low-lying areas where it accumulates and presents health hazards and, potentially, fire hazards. For example, gasoline vapors that leak out of underground structures typically will migrate away from facilities along underground utility trenches.

The tendency for gasoline vapors to accumulate in low-lying areas could present a very real threat to human health in the Segó Lily installation at the western edge of Sugar House Park that serves as a flood control structure and also as an entrance to the underground tunnel that connects the Park with Hidden Hollow across 1300 East. This installation is located less than 100 feet south of the southern property boundary of the proposed Kum & Go gas station, at an elevation approximately 20 to 30 feet lower than the gas station property. During the right wind conditions, petroleum vapors are likely to be blown southward, and settle into the Segó Lily installation and the tunnel.

## 5. Conclusions and Recommendations

We have identified two potential environmental impacts to the Park should the proposed Gas Station be developed on the property on the northwest corner of Sugar House Park. Both potential impacts involve the unique location of the Sugar House Park Segó Lily installation with respect to the proposed Gas Station. The Segó Lily installation is located less than 100 feet south of the proposed Gas Station southern property line and approximately 20 to 30 feet lower than the Gas Station property.

1. During periods of significant precipitation, stormwater runoff from the gas station, which undoubtedly would be laden with gasoline from frequent vehicle fueling spills and other common petroleum product discharges from vehicles (i.e., oil leaks), is very likely to migrate southward and down into the Segó Lily installation. The proposed grading plan is not adequate to control stormwater drainage from the site and should be reworked to direct drainage onto the street westward and northward. In addition, a retaining wall would need to be constructed to ensure that fuel spills and petroleum product-laden stormwater drainage does not flow southward, especially during rare rainfall events (100-year floods).
2. The unique location of the Segó Lily installation also presents, in our opinion, a very real concern to human health due to the likelihood that petroleum product vapors would settle into the installation and the tunnel entrance, as discussed in Section 4. At the very least, collection of these vapors would irritate the nose, throat, and lungs of installation visitors, and potentially escalate to headaches and nausea, which would significantly degrade the experience that was so thoughtfully crafted for this site, in both form and function.

**Figures**

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**Figure 1: Site Map**

Kum & Go Gas Station  
2111 South 1300 East  
Salt Lake City, Utah



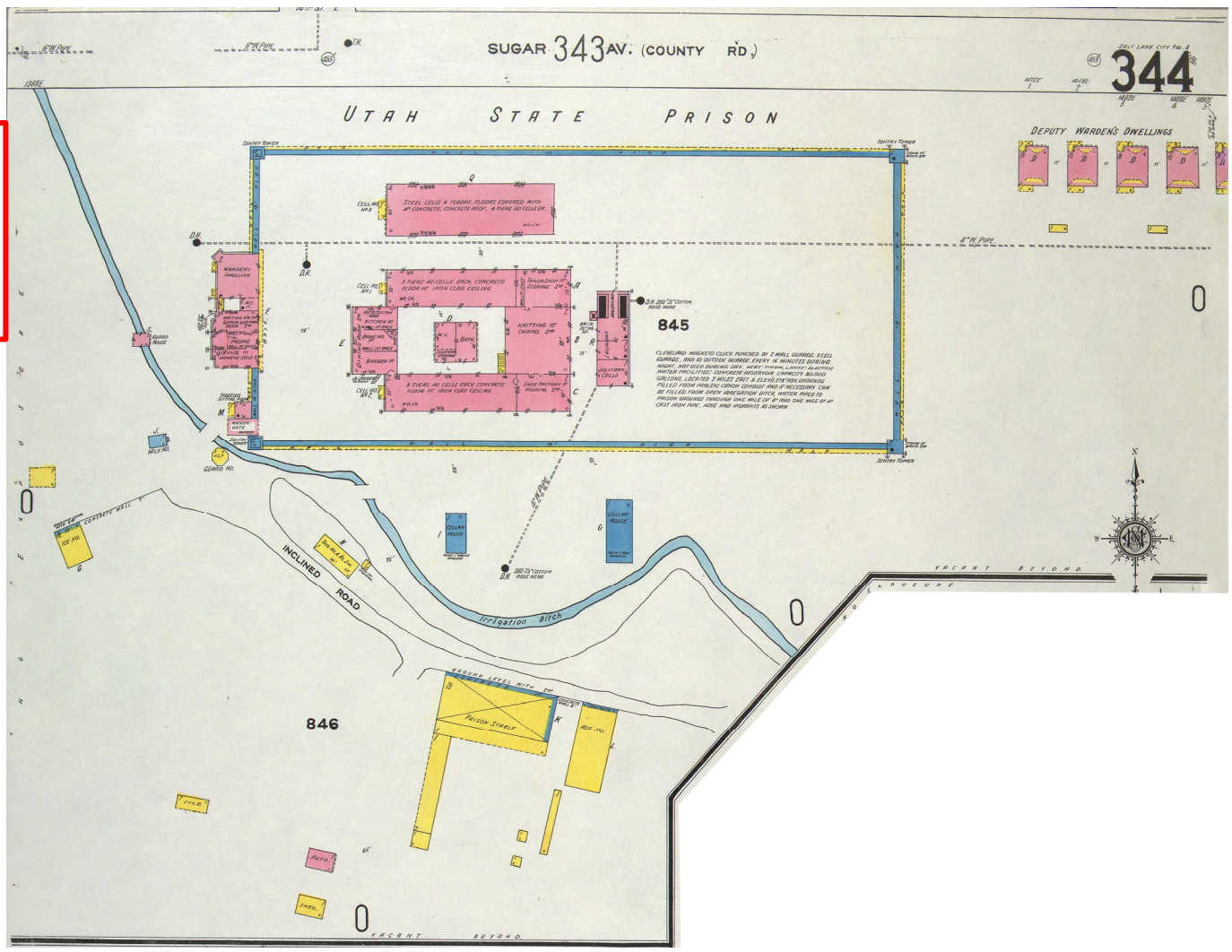
3489 West 2100 South, Suite 150  
Salt Lake City, Utah 84119  
(801) 908-5447

Project No. 2203

Boundaries are approximate. Not to scale.



See Figure 3  
NW Corner  
Sugarhouse  
Park Block



**Figure 2: 1911 Sanborn Map of Utah State Prison Site**

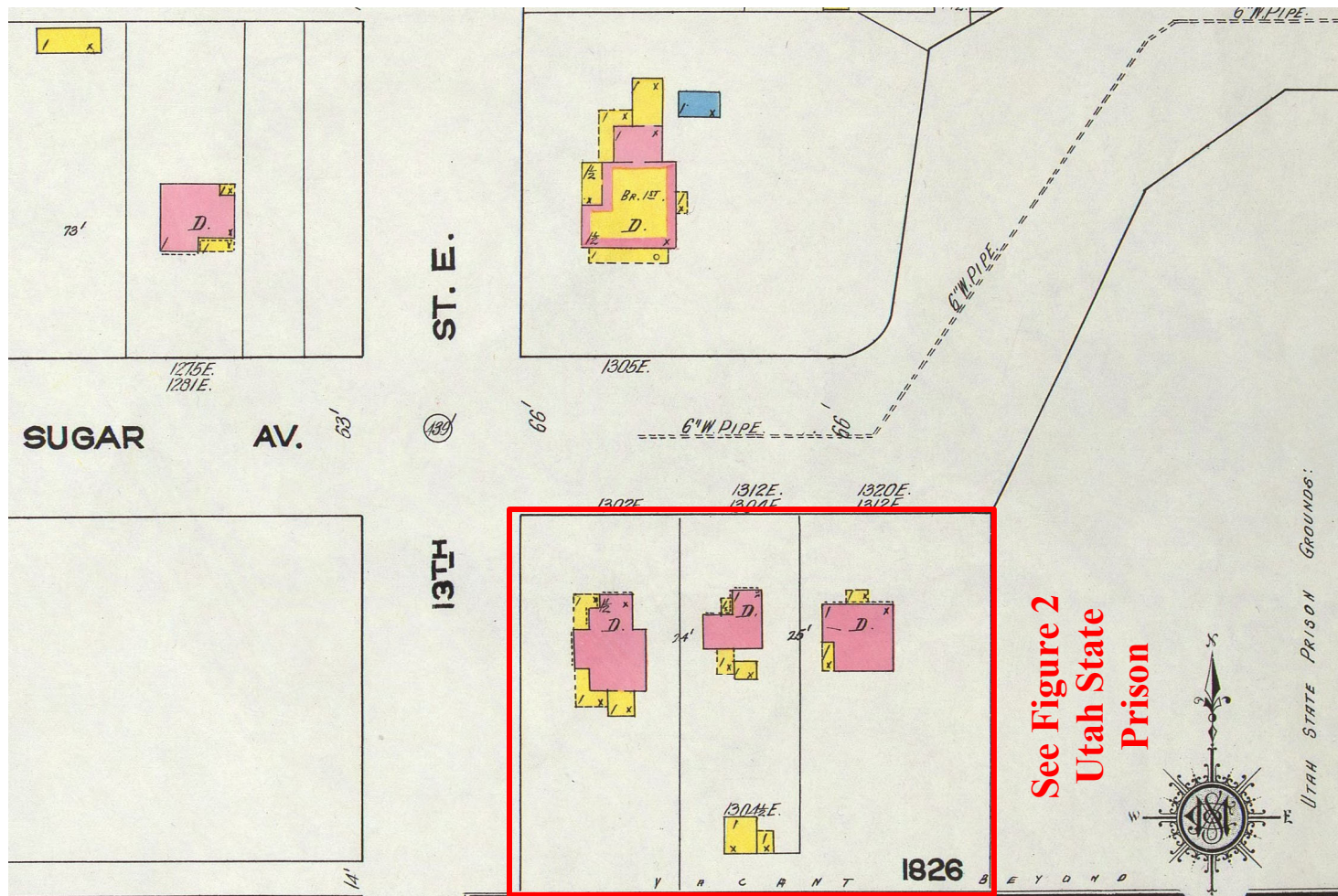
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**Figure 3: 1911 Sanborn Map of NW Corner Sugarhouse Park Block**

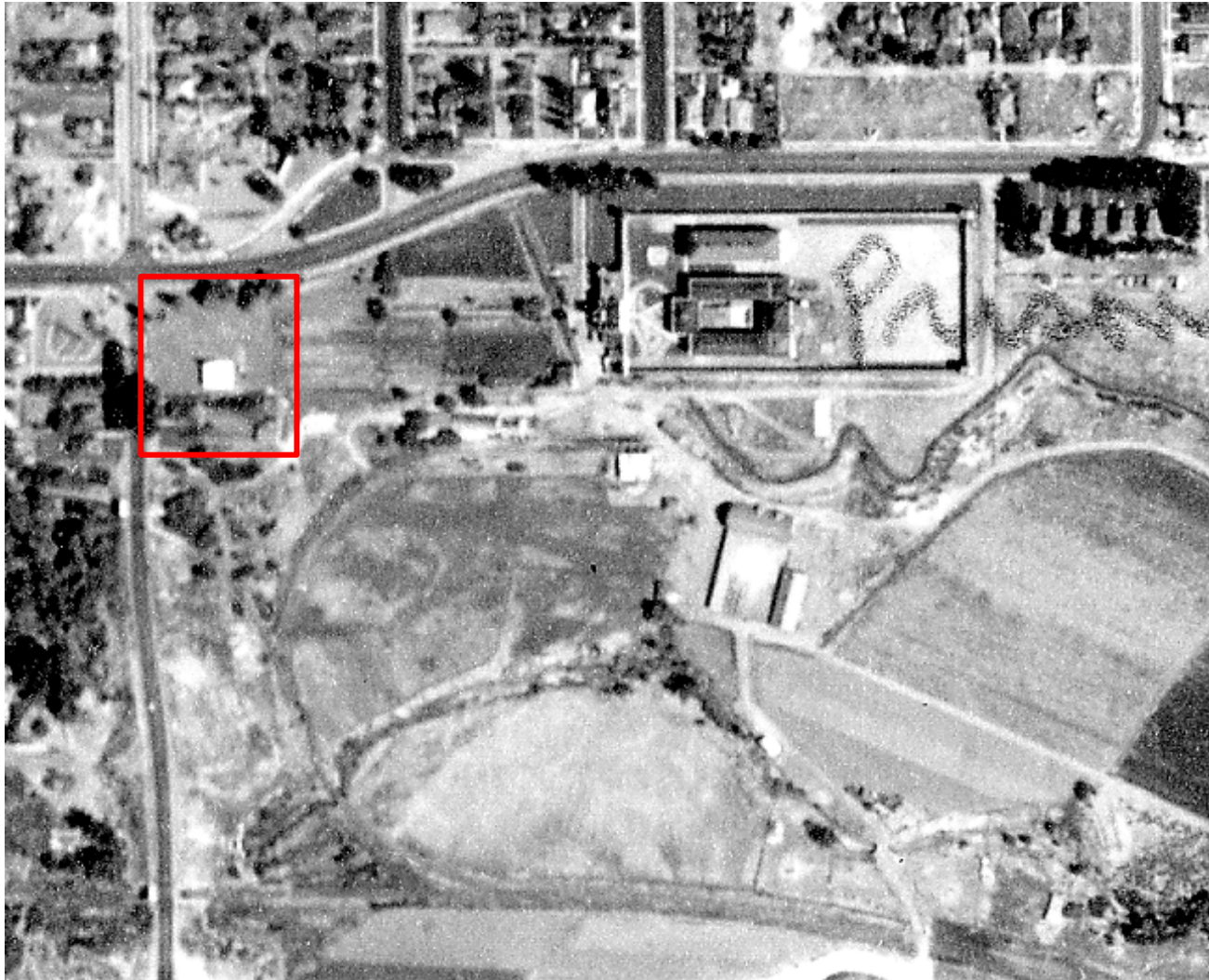
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**Figure 4: 1938 Aerial Photograph**

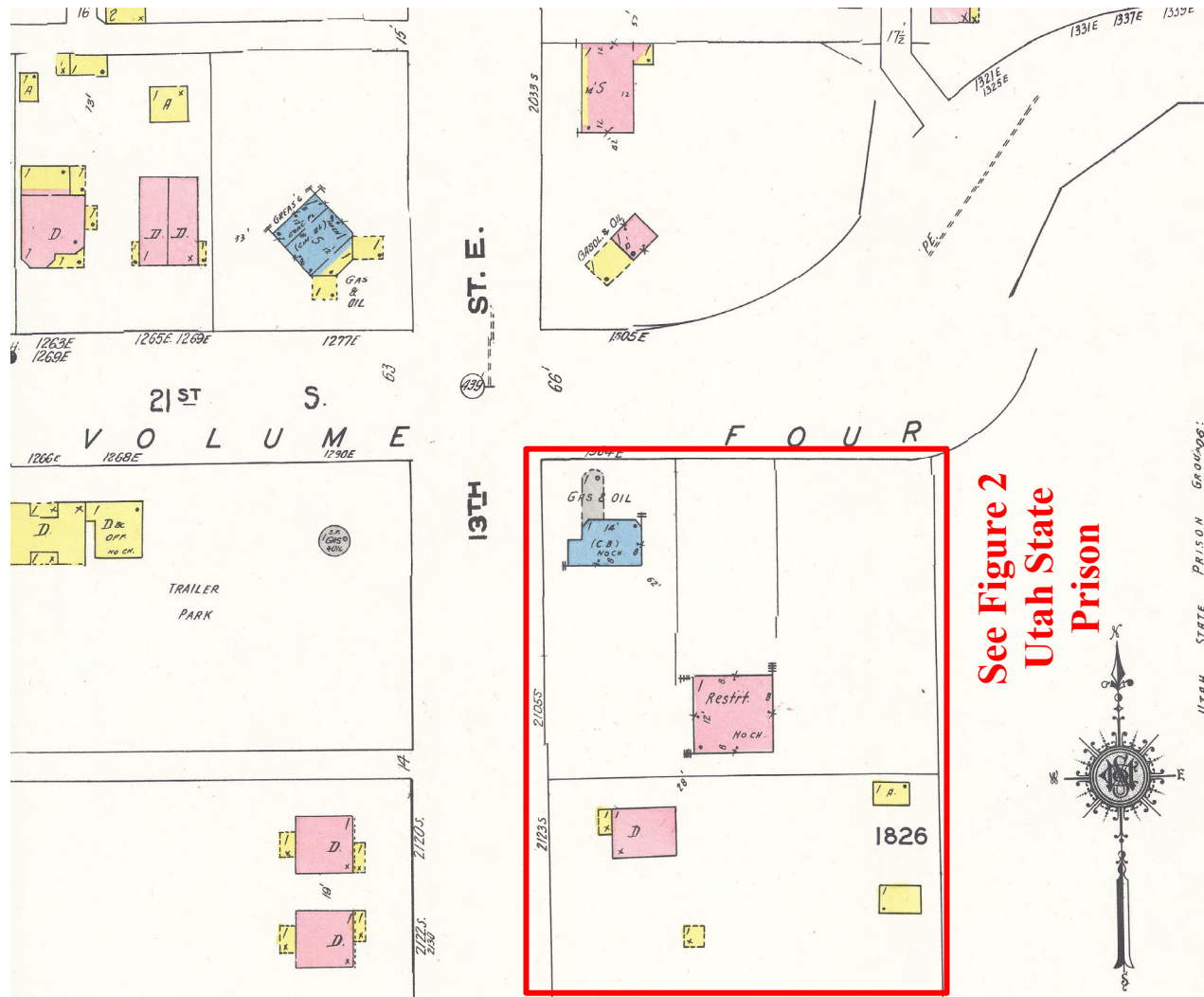
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**Figure 5: 1943 Sanborn Map of NW Corner Sugarhouse Park Block**

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 Salt Lake City, Utah

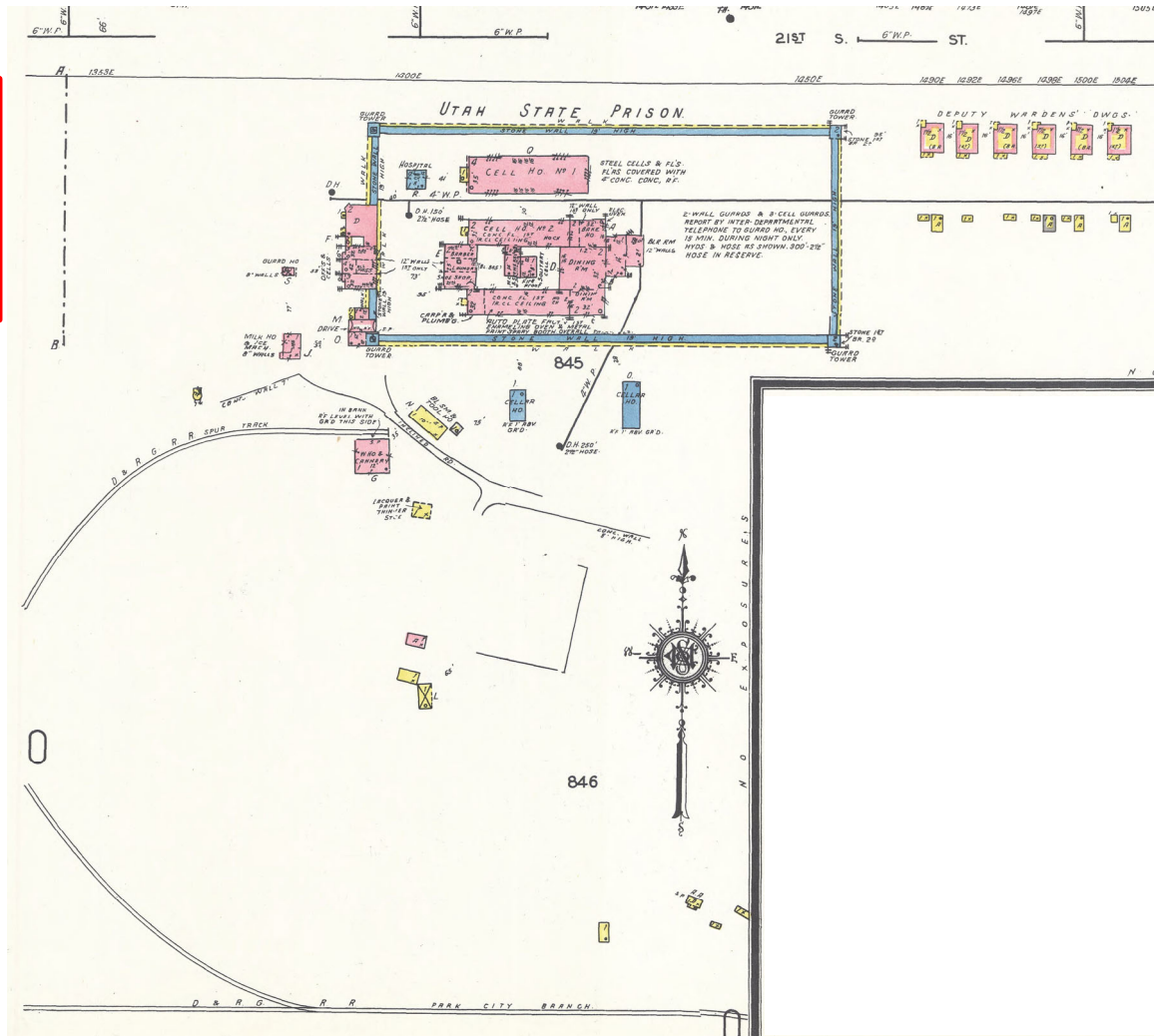


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See Figure 7  
 NW Corner  
 Sugarhouse  
 Park Block



**Figure 6: 1950 Sanborn Map of Utah State Prison Site**

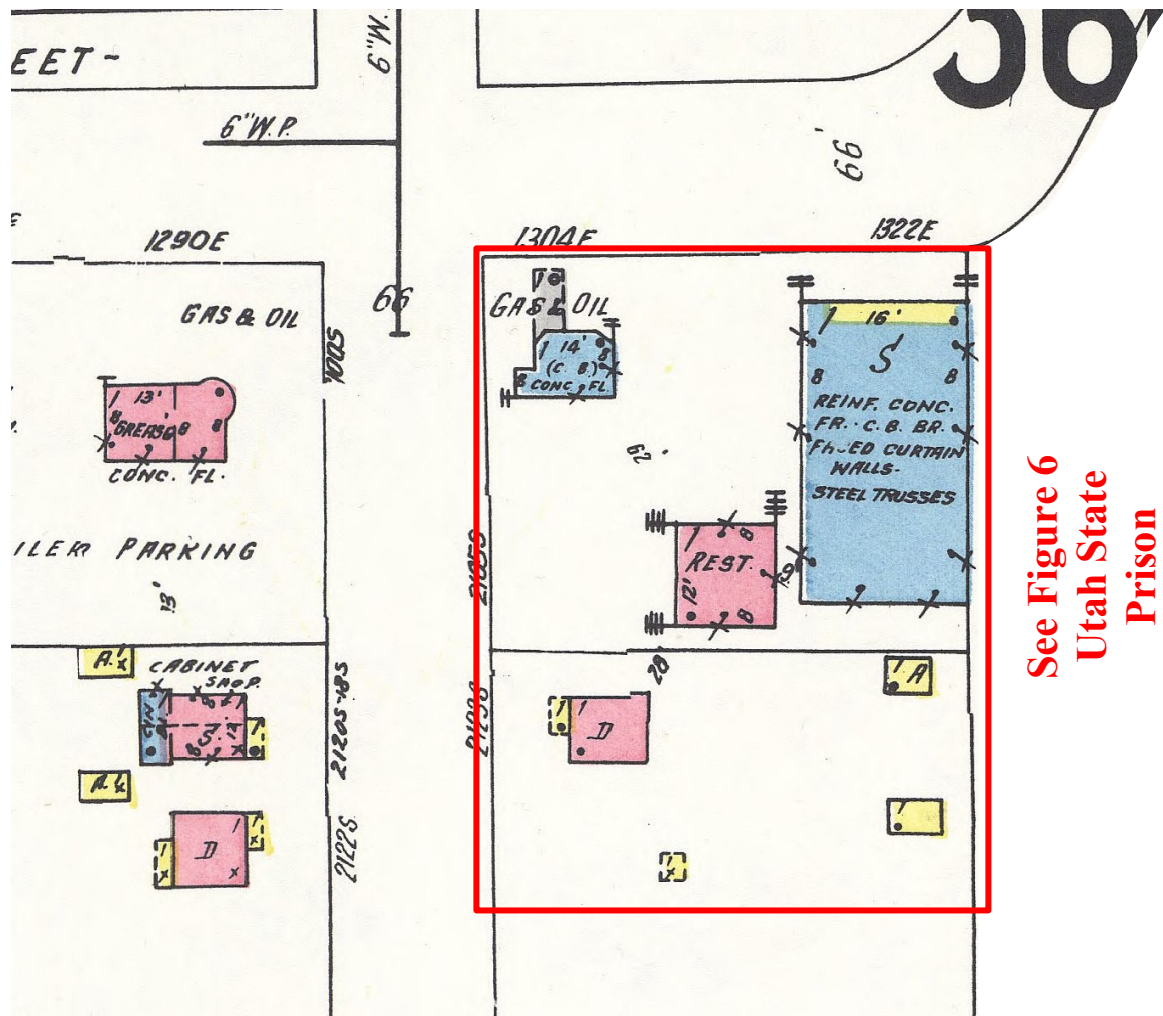
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See Figure 6  
Utah State  
Prison

**Figure 7: 1950 Sanborn Map of NW Corner Sugarhouse Park Block**

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Salt Lake City, Utah



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**Figure 8: 1962 Aerial Photograph**

Kum & Go Gas Station  
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**Figure 9: 1973 Aerial Photograph**

Kum & Go Gas Station  
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**Figure 10: 1979 Aerial Photograph**

Kum & Go Gas Station  
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**Figure 11: 1985 Aerial Photograph**

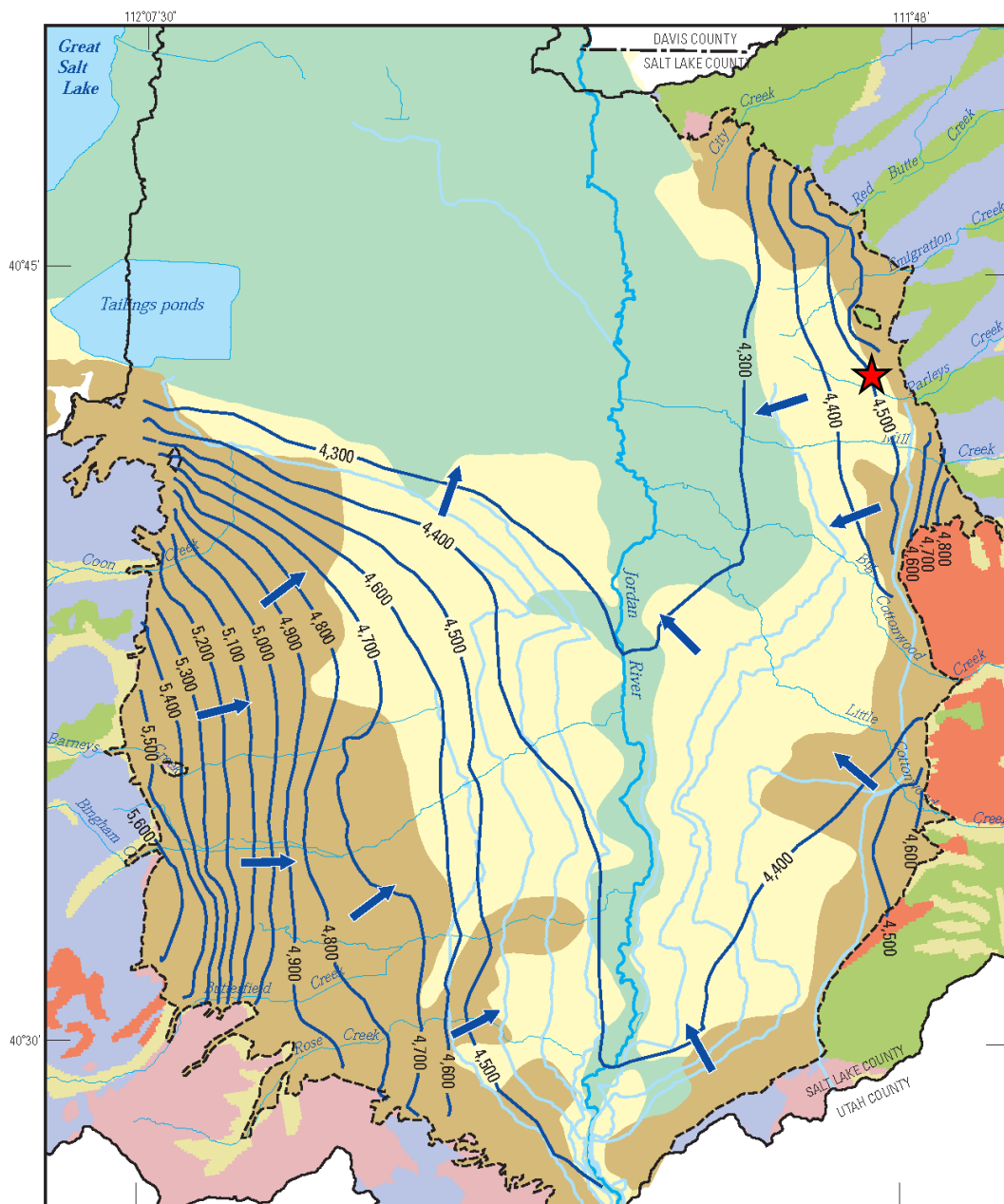
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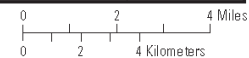
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Base from U.S. Geological Survey digital line graph data, 1979, 1980, Universal Transverse Mercator projection, Zone 12



- |  |   |   |                         |
|--|---|---|-------------------------|
| <b>Geology</b>                         |   | <b>EXPLANATION</b>                                    |                         |
| Carbonate rocks                        | Discharge area  | Primary recharge area                                 | Secondary recharge area |
| Metamorphic or intrusive igneous rocks | Approximate boundary of basin-fill sediments  | Approximate direction of lateral groundwater movement |                         |
| Sedimentary-dominated rocks            | 4,500— Potentiometric contour—Shows altitude of model-computed potentiometric surface for the principal aquifer in 1991 (from Lambert, 1995). Contour interval is 100 feet. Datum is the National Geodetic Vertical Datum of 1929 | Study area boundary                                   |                         |
| Volcanic rocks                         | Canal   |   |                         |
| Basin-fill sediments                   |   |   |                         |
| Sugarhouse Park                        |   |   |                         |

**Figure 12: Groundwater Recharge and Discharge Zones  
Salt Lake Valley, Utah**

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★ Sugarhouse Park

**Figure 13: Salt Lake Valley Groundwater Protection Zones**

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