





## THIRD PRISON SITE LOCATION STUDY

Utah Department of Corrections  
Utah Division of Facilities Construction and Management

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### INTRODUCTION

The Utah Department of Corrections (“DOC”) has undertaken this study in order to plan for the growth of its prisoner population, which will need a significant amount of new space in the next few years. Currently there are approximately 6,700 inmates in the State’s prison system. According to the Department of Corrections roughly 190 prisoners enter the system every year. This means in about seven years another prison the size of the Central Utah Correctional Facility, which can accommodate 1,340 prisoners, will be needed. Given that it takes approximately 4 years to design and build a prison, now is a good time to secure a site in advance of the planning process.

Some of the groundwork for this study was laid in 2006 when the State of Utah published a study entitled “Evaluation of the Feasibility of Relocating the Utah State Prison.” This study was a response to popular interest in the removal and relocation of the State Prison in Draper to another site in a more rural area. The relocation study identified eastern Box Elder County, northeastern Juab County, and Rush Valley in Tooele County as areas that could be suitable for a new prison. The State has now asked the project team to build on the previous study’s site suitability analysis by identifying the most suitable site for a new prison in the previously identified areas. In addition, the project team was asked to create conceptual plans and cost estimates for the construction of the prison on the selected site. Finally, the team was charged with comparing the cost of a 6,000 bed facility at a new site to the cost of constructing the same facility on vacant land next to the Draper Prison.

This report first explains the site selection process and briefly describes the preferred site. The report then presents a conceptual program and site plan along with preliminary infrastructure planning. Finally, the report lays out the associated costs along with a comparison of costs between a new site and expansion on the existing site.

*Wikstrom Economic & Planning Consultants, Inc., is a Salt Lake City based economic, planning and real estate advisory services firm. Wikstrom offers services in economic consulting, planning, real estate development, feasibility studies, market analysis and fiscal analysis.*

## EXECUTIVE SUMMARY

### SITE SUITABILITY ANALYSIS AND SELECTION

The 2006 prison relocation study identified three general areas that would be suitable for a new state prison. These areas included Rush Valley in Tooele County, eastern Box Elder County and northeastern Juab County. Several factors were considered in the selection process including:

- Parcel size
- Topography
- Access to water
- Distance to a hospital with emergency care
- Distance to police
- Natural resources and hazards including:
  - Existence of wetlands
  - Liquefaction potential
  - Flooding potential
- Size of surrounding employment base
- Distance to Salt Lake City (courts and University of Utah Medical Center)
- Distance to highway
- Proximity to residential areas
- Ownership

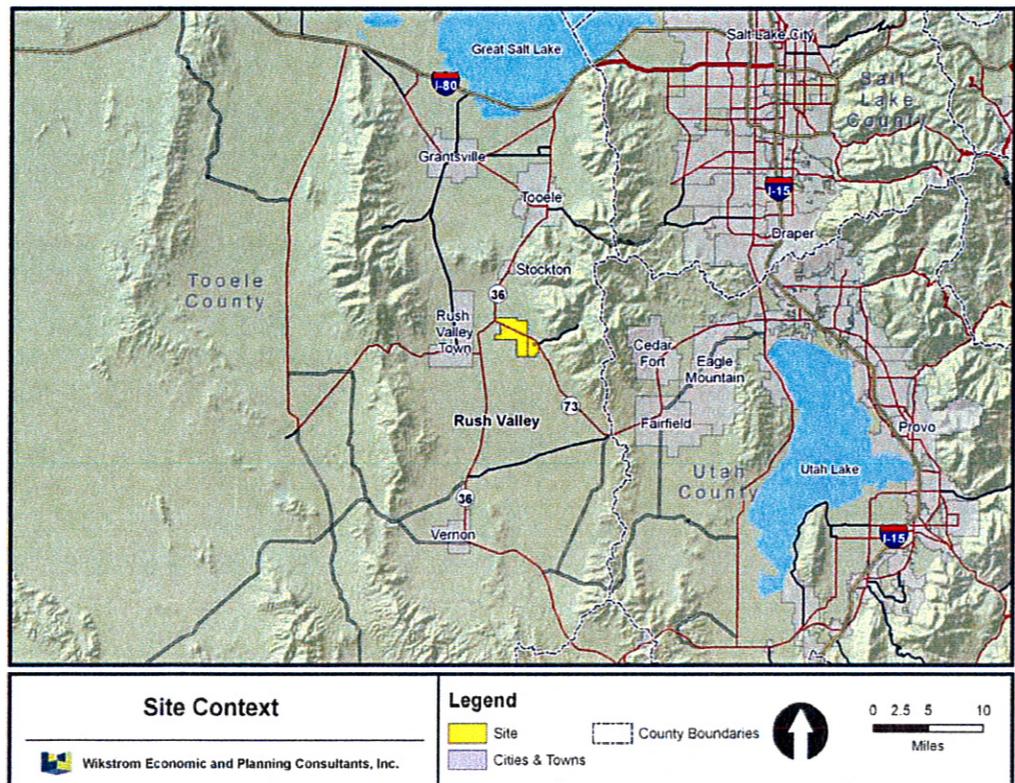


Figure S.1

These factors were used to compare the three general areas to each other and to rank individual parcels in relation to each other. The result of the analysis was to name Rush Valley as the clear winner between the three areas identified by the 2006 study. There were several parcels within Rush Valley to choose between, but one parcel, shown in its context in Figure S.1, stood out as clearly superior to all others in the valley because of its accessibility, size, and topography. The site sits at the intersection of State Highways 36 and 73 in northern Rush Valley. The selection process for this site is described in detail in Section 1 of this report.

The consultants were also asked to evaluate the possibility of locating a new prison near the Salt Lake County Landfill. The consultants found several major obstacles to locating a prison in the area. [Appendix X](#) is a report on the evaluation of the Landfill area.

## ARCHITECTURAL PLANNING

An architectural planning effort has been undertaken to define the major project parameters of a prison with capacities of 6,000 and 10,000 beds. The 6,000 bed facility reflects replacement of the 4,000 beds at the Draper facility plus expansion. The 10,000 bed facility reflects the ultimate available capacity at the Draper site. Of those total bed counts, approximately 85 percent are for men and the remaining 15 percent are for women inmates. Physically separated facilities between genders are anticipated in the analysis.

The primary purpose of the planning effort is to determine the amount of land necessary to locate a prison complex and the general configuration requirements of that land. For the 6,000 bed facility, 245 acres are required for the men's prison and 85 acres are required for the women's prison. To increase the capacity to 10,000 beds requires a total of 380 and 127 acres respectively.

The planning process evaluated the inmate populations and the required segregations to safely house the planned population. Those requirements were aggregated into housing complexes and arranged on the site along with the necessary support spaces to provide a fully functional prison facility. Figure S.2 is the conceptual site plan for the preferred site. It includes all anticipated structures and facilities.

## WATER AND WASTEWATER INFRASTRUCTURE

### CULINARY WATER

Water demands for the new prison site were estimated for 6,000 bed and 10,000 bed facilities. Demands were estimated based on a usage of 115 gallons per bed per day. Using this number, demands were estimated to be:

- 400 gallons per minute (gpm) for a 6,000 bed facility.
- 800 gpm for a 10,000 bed facility.

A single water well drilled at the site could potentially produce water at flow rates of 400 to 800 gpm. (There are several wells near the proposed site that are capable of

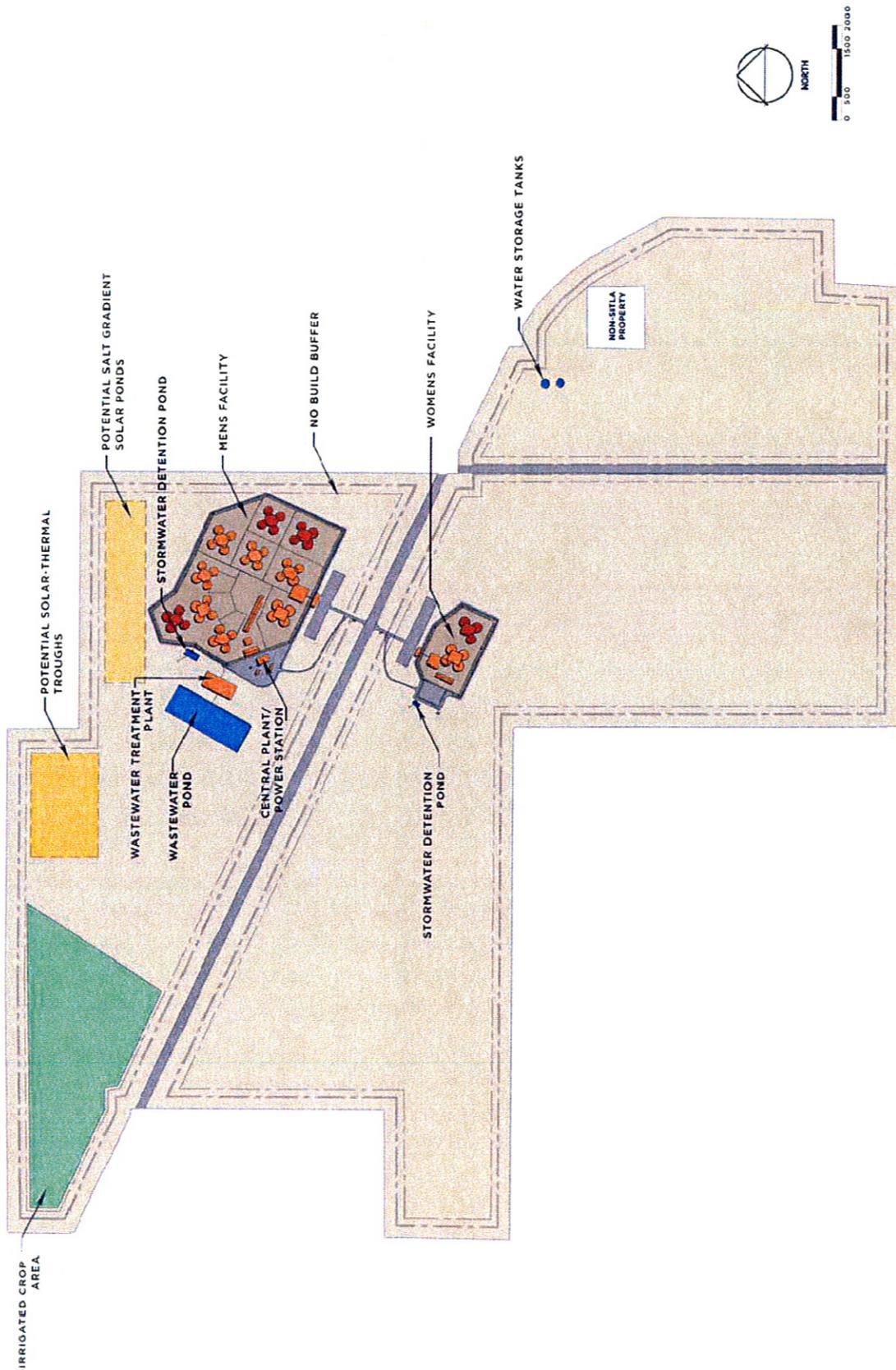


Figure S.2: Master Site Plan

discharges as great as 2,250 gpm.) The site will likely require more than one well to ensure adequate supply. According to available groundwater quality data, the proposed site has total dissolved solids (TDS) concentrations of between 350 and 2,180 milligrams per liter (mg/L). TDS values greater than 1000 mg/L are likely to cause consumer complaint. Because the actual TDS value of a future well on site is unknown, the groundwater at the site will require further detailed investigations to ensure that it has a TDS level below 1,000 mg/L. The conceptual water supply infrastructure includes:

- 2(or more) wells approximately 300-600 feet deep with a 10-12 inch casing. Elevation: 5,520 feet.
- Well flow of approximately 500-800 gpm.
- 2 tanks with 750,000 gallons of storage each. Elevation: 5,540 feet.
- 12 inch water supply line. Length: 7,200 feet. Elevation drop: 160 feet.
- A water supply loop inside the fence in each complex.
- The prison complex at an elevation range of 5,400 feet to 5,300 feet.

### SANITARY SEWER AND WASTEWATER

Two major wastewater treatment alternatives were investigated in this study. These include:

- An Oxidation Ditch Process with Biologic Sludge Reduction.
- Membrane Bio-Reactor (MBR) Process with Mechanical Sludge Dewatering.

Both of these options are capable of producing irrigation reuse water. An MBR system would produce irrigation water usable on food crops without any additional processes. An oxidation ditch system would produce irrigation water usable for food crops only if a filtration and disinfection step were added at the end of the process.

The conceptual wastewater system includes:

- A wastewater treatment plant with a flow rate of 0.7 million gallons per day (MGD) for a 6,000 bed facility or 1.15 MGD for a 10,000 bed facility. Elevation: 5,280 feet.
- A 15-acre, 15-foot deep wastewater storage pond for a 6,000 bed facility or a 25-acre, 15-foot deep pond for a 10,000 bed facility. Elevation: 5,240 feet.
- A gravity flow irrigation line that is approximately 4,900 feet long.
- An irrigated area of approximately 350 acres. Elevation: 5,140 feet to 5,060 feet.

### STORM DRAINAGE

Storm drainage lines and detention ponds were sized to reduce post-development runoff to pre-development runoff volumes and peak flow rates. Storm water detention ponds were sized to reduce peak runoff potential to pre-development levels during a 10-year event. These pond sizes are:

- 1.9 acre-feet (5 feet deep, 140 feet x 140 feet) on the men's side.
- 0.2 acre-feet (5 feet deep, 20 feet x 20 feet) on the women's side.

## ELECTRICAL AND COMMUNICATION INFRASTRUCTURE

### ELECTRICAL LOAD ANALYSIS & POWER DISTRIBUTION

#### *Load Analysis*

Electrical demands for the new prison site were estimated in the 10 to 15 Mega Watt Range. Those demands were estimated based on a historical analysis of usage at the Draper Facility. Using this demand, PacifiCorp can service the new campus from two locations:

- At 46 kilovolts from the Tooele Substation.
- At 15 kilovolts from the Rush Valley Substation.

Under either option, service will require extensions to the new site with upgrades to the existing off-site utility infrastructure.

#### *Power Distribution*

Secondary Campus Power should be delivered from a Department of Corrections sub-station at 15 kilovolts with redundant feeder duct-banks throughout the campus. The main physical plant should have Co-Generation capabilities for redundancy of electrical distribution. A Combined Heat and Power Plant design would provide optimal energy conservation. Campus illumination should employ high mast lighting techniques in the 3 footcandle range for optimal nighttime security considerations.

### DATA & COMMUNICATIONS

#### *To the Site*

Primary delivery of communications services to the prison site should be via fiber from the nearest utility provider. Qwest has a main switch facility in Tooele and fiber is already to the site.

#### *Within the Site*

Communications infrastructure within the site will be placed in an underground duct bank, which would encircle the site. The duct bank would include vaults for installation and maintenance.

### SECURITY SYSTEMS

#### *Perimeter Fence*

Fence protection using sensor cable on the fence fabric and microwave detection zones between the dual rings of fence should be the primary method of detection. This method is currently deployed by the State in its other facilities.

#### *Perimeter Towers & Gate Control*

Two towers should control the central vehicle entrance with an additional tower at each change in direction by the fence, thus maintaining a “visual” of all fence lines.

#### *Perimeter Cameras*

Video surveillance will supplement the guard’s vision, not replace it. Cameras should be deployed to cover the same areas covered by guards; however, monitoring should be done by direct visual lookout, not by viewing video monitors, which should be relied upon primarily for their recording function.

## RENEWABLE ENERGY ANALYSIS

The Rush Valley site offers significant potential for diversified renewable energy development at a 'district' energy scale. No single source similar to the geothermal resource at the present Draper Prison site, however, is likely to be identified. By applying a simultaneous strategy of 'high-performance' facility design to reduce energy demand, while developing a combination of renewable energy resources with utility grid backup, the DOC may achieve a high degree of energy self sufficiency at the Rush Valley site. As a complement to utility grid-sourced electrical and natural gas, renewable energy forms may offer a portion of the total energy demand of the prospective facility, and do so to provide some degree of energy and budget independence from future utility price fluctuations and power/fuel reliability concerns.

An inventory of potential renewable energy sources in the present analysis includes multiple forms of solar radiation capture and conversion to heat and electricity, wind electrical generation, biomass conversion to heat and electricity, geothermal heat and power, and small-scale hydroelectric generation. **Solar-thermal resources and multiple capture-conversion technologies appear, in this preliminary assessment, to promise both scale and versatility to fit the proposed project and its eventual expansion, providing both heat and electrical power, and storing a portion of thermal energy for use when needed.** Wind, biomass, geothermal and hydroelectric prospects are not understood quantitatively clearly enough to prioritize relative to other resource/technology combinations. Further, site-specific data-gathering and regional resources analyses are appropriate for these energy resources.

All possible technologies and the corresponding costs of renewable energy applications will be unique to the site, requiring further planning and engineering to define investment requirements for the various levels of renewable energy production: part of facility needs, all of facility needs, and energy production to fulfill all facility needs and to export renewable energy to the utility grid. As a hedge against future fuel price instability, planning for an excess of energy production on-site—for the DOC facility to become a 'net energy exporter,' fully utilizing the extensive property at the site—may present a State strategy worthy of serious consideration.

## PROJECT COSTS

### CONSTRUCTION COST COMPARISONS

Construction costs were estimated for three different scenarios, which are described below. Two scenarios are based on the same site—in Rush Valley. The only difference between the two is the size of the facility. The purpose of the third scenario is to compare the cost of constructing identical facilities in Rush Valley versus in Draper, next to the existing prison site.

The first scenario consists of a 6,000 bed facility located in Rush Valley. The facility would have seven male housing pods and one female housing pod. The estimated cost for this scenario is \$984,635,000.

The second scenario represents an expansion of the first scenario. It would provide 10,000 beds in ten male housing pods and two female housing pods. It not only in-

cludes more housing pods, but also additional support structures and site development. The estimated cost for this scenario is \$1,345,505,000.

The third scenario consists of a 6,000 bed facility located just west of the existing prison in Draper. This scenario would incorporate a development program identical to the Rush Valley 6,000 bed scenario. The cost of this scenario will, therefore, be very close to the Rush Valley 6,000 bed scenario. However, this scenario will cost somewhat less due to the proximity of existing utilities. The estimated cost for this scenario is \$973,069,000. While this amount is somewhat less than the Rush Valley total, the difference is only about one percent of total construction cost.

## OPERATIONAL COST COMPARISONS

Changing the location of the main prison facility or adding a third site to the current prison system will result in additional operational costs. Prisoner transportation expenditures would be the most affected operational cost. Sufficient data was available to project changes in transportation cost if a third site were built. Other operational costs would change somewhat; however, data needed to project other cost changes besides transportation was not available. Transportation related expenditures represent approximately four percent of the Draper facility's \$73.7 million budget.

The cost of providing prisoner transportation is directly related to the change in distance between the prison and the destination. Distances were modeled between potential new sites and each of the destination types: inmate placement program ("IPP"), board of pardons and parole ("BOPP"), court appointments (e.g. appeals, hearings, custody issues, etc.), medical needs, and assignment.

Two transportation scenarios were run. One compared the cost of providing transportation for Rush Valley as a replacement for the current Draper facility (Table S.1). This scenario resulted in a 30 percent cost increase. The second scenario assumed Draper would remain as the main prison facility and Rush Valley would be added as a third prison site (Table S.2). The cost of running a third site with a total of 10,000 beds (6,000 in Rush Valley and 4,000 in Draper) is less than a full location to Rush Valley but still higher than the same number of beds at Draper. See the operational cost analysis in Section 6 for additional detail.

Table S.1. Transportation Cost Comparison

Beds	Draper	Rush Valley	Difference from Draper	Percent Change from Draper
4,000	\$3,767,192	\$4,890,915	\$1,123,722	30%
6,000	\$5,515,635	\$7,162,137	\$1,646,502	30%
10,000	\$9,012,521	\$11,704,581	\$2,692,060	30%

Note: Assumes all bed are filled to 95% capacity

Table S.2. Cost of 10,000 Beds As a Three Site Scenario

Location	Beds	Cost
Draper	4,000	\$4,685,881
Rush Valley	6,000	\$6,177,819
<b>Total</b>	<b>10,000</b>	<b>\$10,863,700</b>

Note: Assumes all bed are filled to 95% capacity