

## MEMORANDUM

**TO:** Board of Trustees

**THROUGH:** Indra Winquest  
District General Manager

**FROM:** Brad Underwood, P.E.  
Director of Public Works

**SUBJECT:** Review and discuss - Effluent Storage (Pond Lining) Project Update

**STRATEGIC PLAN:** Long Range Principle 5 – Assets and Infrastructure

**DATE:** March 1, 2022

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### **I. RECOMMENDATION**

This memo is provided for Effluent Storage Project informational update purposes only.

### **II. District Strategic Plan**

Long Range Principle 5 – Assets and Infrastructure – The District will practice perpetual asset renewal, replacement, and improvement to provide safe and superior long term utility services and recreation venues, facilities and services.

- Maintain, renew, expand, and enhance District infrastructure to meet the capacity needs and desires of the community for future generations.
- Maintain, procure, and construct District assets to ensure safe and accessible operations for the public and the District’s workforce.

### **III. BACKGROUND**

The CMAR team (IVGID Public Works, Jacobs, and Granite) was notified in December 2021 by Department of Water Resources (DWR) - Division of Dam Safety that the proposed 60% Effluent Pond Lining Project would require formal submittal of an Application for Approval of Dam Plans (dam permit). A dam permit requires structural and hydraulic analyses of the existing dam in addition to a likely requirement for improvements to the existing spillway to prevent overtopping of the dam in the event of a Probable Maximum Flood event. The dam permit application

would require considerable engineering resources and, more importantly, a significant time delay to the pond lining project (estimated >12 months). The Pond 2 lining project was intended to provide the effluent storage volume necessary to commence the effluent pipeline replacement. Due to the increased evaluation required by Division of Dam Safety, the CMAR team has moved to reinvestigate options for Pond 1 to store effluent in an emergency situation to meet the NDEP permit requirements for the WRRF.

During subsequent meetings with the Nevada Department of Environmental Protection (NDEP) and DWR in January and February 2022, the CMAR team has provided the regulatory agencies with information summarizing the critical nature of the effluent pipeline project. The main point of discussion was the potential design options required to temporarily line Pond 2 to provide the necessary storage volume to accommodate the effluent pipeline construction in an effective and efficient manner.

Several options for effluent storage at Pond 1 have been discussed and investigated to date. Following are the recommended options for continued design development so that feasibility, relative benefits, risks, and costs can be properly assessed.

#### 1. HDPE Liner to Pond 1

This option includes grading to prepare the existing surface in a manner suitable to support an HDPE liner. The existing Dam 1 will remain in place but upstream civil and drainage improvements will be required to minimize and reduce surface stormwater flows currently discharging to Pond 1.

Security fencing will be required around the perimeter. This option may also require re-treatment of the effluent water due to the open air nature of the facility.

Advantages of the HDPE liner in Pond 1 are the reduced earthwork quantities required and the smaller construction costs.

A preliminary opinion of probable construction cost (OPCC) is approximately \$6,490,000.

Inclusive of approximate estimated costs:

- \$1.71M construction
- \$0.88M design/permitting
- \$3.9M TRPA SEZ coverage mitigation

## 2. 2MG Steel Tank

This option is for a standard, circular steel tank similar to current IVGID-owned, potable water storage tanks in existence throughout the District.

The tank would be placed in Pond 1 and would require removal of the existing Dam 1. Removal of the dam to accommodate the tank would require a large volume of earthwork to be exported from the site. The tank dimensions are expected to be 136-ft diameter and approximately 24-ft tall.

This tank will be placed directly in line with the current effluent discharge stream from the WRRF and could be used as part of daily operations and in emergency situations with no additional operational activity required. The tank option eliminates the potential need for retreatment of effluent storage.

Advantages to this option include IVGID staff familiarity with tank operation, inspection, and maintenance. The primary disadvantage is the large volume of earthwork required to construct the tank.

A preliminary OPCC is approximately \$8,300,000.

Inclusive of approximate estimated costs:

- \$6.27M construction
- \$0.93M design/permitting
- \$1.1M TRPA SEZ coverage mitigation

## 3. 2MG Pre-Stressed Concrete Tank

This option is similar to the steel tank described above. Instead of welded steel construction, this option is constructed of pre-stressed reinforced concrete.

The tank would be placed in Pond 1 and would require removal of the existing Dam 1. Removal of the dam to accommodate the tank would require a large volume of earthwork to be exported from the site. The tank dimensions are expected to be 136-ft diameter and approximately 21 feet tall.

This tank will be placed directly in line with the current effluent discharge stream from the WRRF and could be used as part of daily operations and in emergency situations with no additional operational activity required. The tank option eliminates the potential need for retreatment of effluent storage.

Advantages of the concrete tank include the ability to partially bury the tank to mitigate visual impact and a slightly shorter overall height. The primary disadvantage is the large volume of earthwork required to construct the tank.

A preliminary OPCC is approximately \$7,630,000.

Inclusive of approximate estimated costs:

- \$5.6M construction plus contingencies
- \$0.93M design/permitting
- \$1.1M TRPA SEZ coverage mitigation

Another option - a cast-in-place concrete basin - was not recommended for further design consideration.

All of the considered options require engineering and design beyond the respective storage facility itself.

In each case, a geotechnical investigation will be necessary to inform the structural foundation design. A geotechnical report and specific recommendations for each proposed alternative shall be included, as appropriate.

A hydrologic assessment and design report will be necessary in each case with regard to the permanent use of or removal of the existing Dam 1. This dam is currently inspected annually by DWR, and the CMAR team will be responsible for analyses of the contributing watershed and associated flow volumes resulting from possible flooding events. Whether Dam 1 is maintained or removed, the evaluation and report must demonstrate that the resulting net effects of stormwater runoff are mitigated to within acceptable standards.

It is important to note that all of the potential options will have land capability coverage impacts that require permitting/approvals with TRPA. The implications of the coverage are unknown although both Pond 1 and Pond 2 are currently identified as 1b (SEZ) and could require mitigation efforts at 1.5:1. These estimated costs are included in the overall project as outlined in the options above. As part of the further evaluation, staff will be meeting with TRPA to investigate opportunities to drive down the cost of these fees.

#### **IV. BID RESULTS**

There are no bid results associated with this item.

#### **V. FINANCIAL IMPACT AND BUDGET**

To investigate preliminary design options and OPCC's for placing the effluent storage facility within Pond 1, staff approved a contract amendment with Jacobs



to include this scope in the amount of \$18,800 from the approved contingency. An additional contract amendment to advance the three recommended options to the 30% design level is needed and will be brought to the Board for approval.

Funding exists within the FY 2021-22 CIP Budget for the Effluent Pond Lining Project 2599SS2010 (see attached data sheet – Attachment B) in the amount of \$1,550,000.

Following is a summary of the Jacobs contract amounts to date:

Contract	Amount	Total Amount
Original	\$36,000	\$36,000
ASA 1 (Scope Change)	\$0	\$36,000
ASA 2	\$425,339 *	\$461,339
ASA 3	\$18,800 **	\$480,139

\* A \$40,000 contingency was authorized by the Board with ASA 2

\*\* The amount of contingency remaining with the approval of ASA 3 is \$21,200.

Engineering Staff time will also be billed to the project to manage the design and bidding phase of the project.

## **VI. ALTERNATIVES**

The CMAR team at this time recommends advancing three options to a 30% design level so that further technical and cost evaluations can be completed using an increased level of information suitable for a project of this importance and scope. An alternative would be to choose one of the design options without obtaining further information for an effective evaluation of all three options.

## **VII. BUSINESS IMPACT**

This item is not a "rule" within the meaning of Nevada Revised Statutes, Chapter 237, and does not require a Business Impact Statement.

Attachments:

- Pond 1 Effluent Storage Alternatives - DRAFT (Jacobs)
- CIP Data Sheet
- Presentation

## Pond 1 Effluent Storage Alternatives - DRAFT

<b>Date:</b>	February 21, 2022	<b>Jacobs</b>
<b>Project name:</b>	IVGID Effluent Export Pond Lining	2525 Airpark Drive
<b>Project no:</b>	W8Y12900	Redding, CA 96001-2443
<b>Attention:</b>	Brad Underwood	United States
<b>Company:</b>	Incline Village General Improvement District:	T +1.530.243.5831
<b>Prepared by:</b>	Ashley Kellogg, PE	F +1.530.243.1654
<b>Copies to:</b>	Granite Construction	

### Project Background:

Incline Village General Improvement District (IVGID) currently operates a Water Resource Reclamation Facility (WRRF) in Incline Village, NV. The facility includes two unlined reservoirs initially designed for effluent storage: Pond 1 located immediately adjacent to the WRRF and Pond 2 north of the facility and at a lower elevation. Pond 1 has an approximate existing storage capacity of 2 MG, while Pond 2 is contained by Mill Creek No. 2 Dam and has an approximate existing storage capacity of 15 MG. IVGID’s current operating permit prohibits use of an unlined pond for emergency effluent storage, therefore IVGID is pursuing a permanent effluent storage option to satisfy their operating permit requirements. The 60% design of pond lining at Pond 2 was submitted to Nevada Department of Water Resources Division of Dam Safety for their review. The Division of Dam Safety team conferred with the State Engineer and then notified the Design team in December 2021 that the proposed 60% Effluent Pond Lining Project requires formal submittal of an Application for Approval of Dam Plans (dam permit). A dam permit consists of structural and hydraulic analyses of the existing dam in addition to improvements of the existing spillway to prevent overtopping of the dam in the event of a Probable Maximum Flood event. The dam permit application would require considerable engineering resources and, importantly, a significant time delay to the pond lining project (estimated >12 months).

Agreements between IVGID, Jacobs Engineering, and Granite Construction (CMAR), have been established to initiate review of Pond 1 options for design and construction of the required permanent effluent storage improvements at the WRRF plant.



### **Effluent Storage Alternative Analysis:**

The alternative analysis presented below is comprised of effluent storage management criteria, alternative development, initial alternative screening, and results.

### **Effluent Storage Management Criteria**

Following are effluent storage criteria:

- Effluent storage capacity must be a minimum of 2.0 MG to accommodate 48 hours of average peak flow rates.
- The jurisdictional embankment (Mill Creek Dam No 1) must be considered, and NV DWR review will be required.
  - If removed, dam will be decommissioned per NAC 535.220
  - If remaining, application requirements to be determined by NV DWR
- Effluent must flow by gravity (i.e., without additional pumping) from the WRRF into the basin or storage facility. Effluent must be plumbed to both the existing pumping station (to pump effluent back to the WRRF headworks) or be conveyed to the export pipeline.
- Effluent storage improvements and basin lining should consider protection or relocation of the existing decant facility.
- Effluent Storage shall be in accordance with Nevada Division of Environmental Protection (NDEP) requirements.
- TRPA 1b SEZ Coverage impact must be considered with each alternative and is included in estimated project cost.

### **Alternative Development:**

Effluent storage alternatives were developed based on the criteria presented above and are described below. The alternatives considered with Mill Creek Dam No 1 decommissioning were construction of a concrete basin with vertical walls, and construction of a single enclosed tank: welded steel or prestressed concrete. Lining the basin with HDPE geomembrane was also considered but will not include decommissioning of Mill Creek Dam No 1 and annual inspections will remain necessary.

#### **Single Enclosed Tank – Welded Steel**

IVGID currently maintains an existing welded steel storage tank for effluent storage and is familiar with the construction and maintenance requirements of such a system. To accommodate existing plant hydraulics, the minimum bottom of tank elevation would be 6461' with the maximum water elevation at 6479'. The assumed tank diameter is 136 feet with a height of 20' depending on freeboard requirements. Resource Development Company of Reno, NV has provided the initial estimate for welded steel tank installation. Earthwork, site preparation and construction of the grade band would be completed by Granite Construction. An 18' access road around the tank would be provided for maintenance and access to the spoil decant facility, to remain. Extensive earthwork within the pond would be required for Mill Creek Dam No. 1 decommissioning and to accommodate the bottom of tank elevation and the permanent access around the installed tank.

#### **Single Enclosed Tank – Prestressed Concrete**

Similar to the hydraulic requirements of a welded steel tank, it is anticipated that a prestressed concrete tank would need to be of similar dimensions and require the same amount of earthwork and site preparation prior to installation. DN Tanks specializes in prestressing of concrete tanks and would complete the prestressing after the casting of concrete panels of the tank. Compared to the lifecycle of a

welded steel tank, there are little to no repairs or maintenance required over the extended lifetime of a concrete tank. A prestressed concrete tank can also be partially buried, reducing the amount of earthwork export during construction. Initial earthwork for decommissioning Mill Creek Dam No. 1 and tank construction would be the same as that for the welded steel tank option.

**Reinforced Concrete Basin**

The proposed reinforced concrete basin storage volume of 2 MG would be accommodated with the decommissioning of Mill Creek Dam No. 1 but would require less earthwork export than the single enclosed tank options. Vertical walls would be constructed around the perimeter of the basin with a 6-inch reinforced concrete bottom slab at approximate elevation 6469'. Backfill outside of the vertical walls would allow for a perimeter access road and the spoil decant facility would remain near the existing location. The basin would be an open system so stormwater runoff would be routed around the basin to avoid excess stormwater collection within the basin. No vehicular access is planned into the basin so maintenance within the basin may be a challenge.

**HDPE Liner**

Per NDEP WTS-37 a dual geomembrane liner system of 60-mil primary and 40-mil secondary would be required. HDPE is proposed for the geomembrane system with geonet installed between the primary and secondary liners and a leak detection system. To avoid potential impact to Mill Creek Dam No. 1, lining of Pond 1 would be considered with minimal earthwork to prepare the slopes and pond bottom. This effort would prevent a decrease in storage volume. The available storage volume with the pond preparation and assumed 3-feet of freeboard would be 2.5MG. Although the initial investment in the liner system is much less than that of the tank and concrete basin option, the lifetime of the liner is a fraction of that of the other systems. Liner replacement cost should be assumed every 20-30 years during the basin life.

**Alternative Analysis Results:**

The alternatives, preliminary construction costs and considerations are summarized below.

Alternative	Estimated Project Cost	Considerations
Single Enclosed Tank – Welded Steel	\$8.3 Million	<p>Tanks are enclosed and, therefore, allow for greater detention durations before conveying effluent to the export pipeline as opposed to requiring pumping and retreatment through the WRRF.</p> <p>Extensive earthwork is required to provide room for the single tank within the basin footprint, including an increase of the side slopes to 2H:1V.</p> <p>IVGID is familiar with the maintenance and function of an enclosed tank for effluent storage.</p>
Single Enclosed Tank – Prestressed Concrete	\$7.6 Million	<p>Similar considerations for enclosure and grading as the steel tank.</p> <p>Lifetime maintenance costs may be less than that of a welded steel tank. Minimal maintenance is required once installed.</p> <p>Tank can be buried to reduce earthwork export volume.</p>

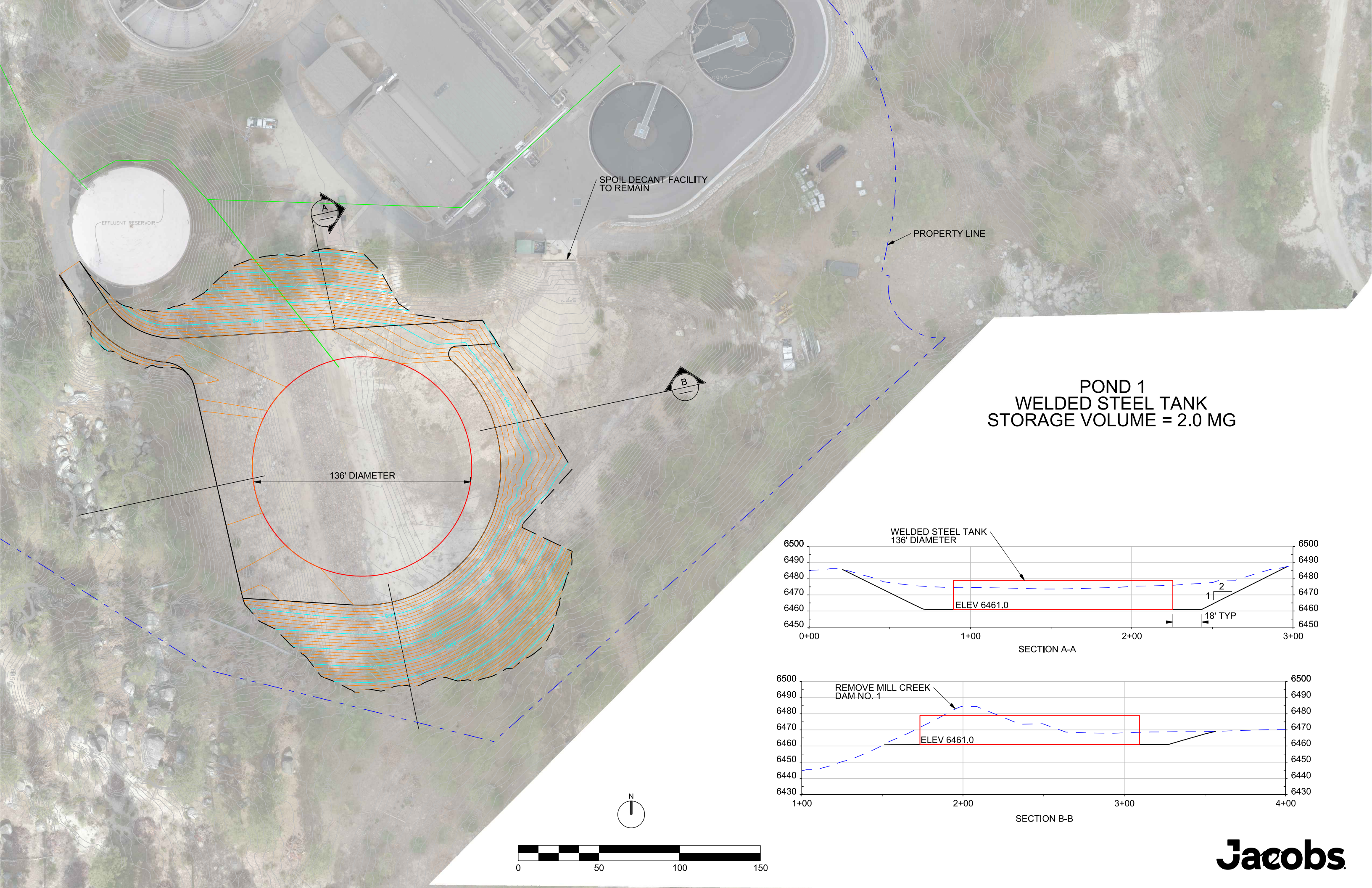
## Memorandum

Alternative	Estimated Project Cost	Considerations
Reinforced Concrete Basin	\$8.1 Million	<p>Concrete has a longer life span than a geomembrane liner but is more expensive and has a higher leakage rate.</p> <p>An open system is subject to natural elements such as snow and stormwater runoff and must be fenced to prevent unwanted activity or animals becoming trapped.</p> <p>Existing spoil decant facility would require some reconfiguration to accommodate basin.</p>
HDPE Liner	\$6.5 Million	<p>HDPE is widely used and preferred by NDEP for effluent storage and initial cost is lowest.</p> <p>Minimal earthwork would be required to prepare existing basin for liner system and to provide target storage volume.</p> <p>Maintaining Pond 1 would require the continued inspection and responsibility of Mill Creek Dam No. 1</p>

### Recommendations and Next Steps:

After consideration, IVGID does not wish to pursue the reinforced concrete basin alternative due to the open system and maintenance restrictions. To support the optimal opportunity for IVGID and the life of the WRRF, the CMAR team is recommending to advance the remaining three alternatives to 30% Design level for more accurate risk analysis and cost estimation prior to an ultimate decision for final design and construction.



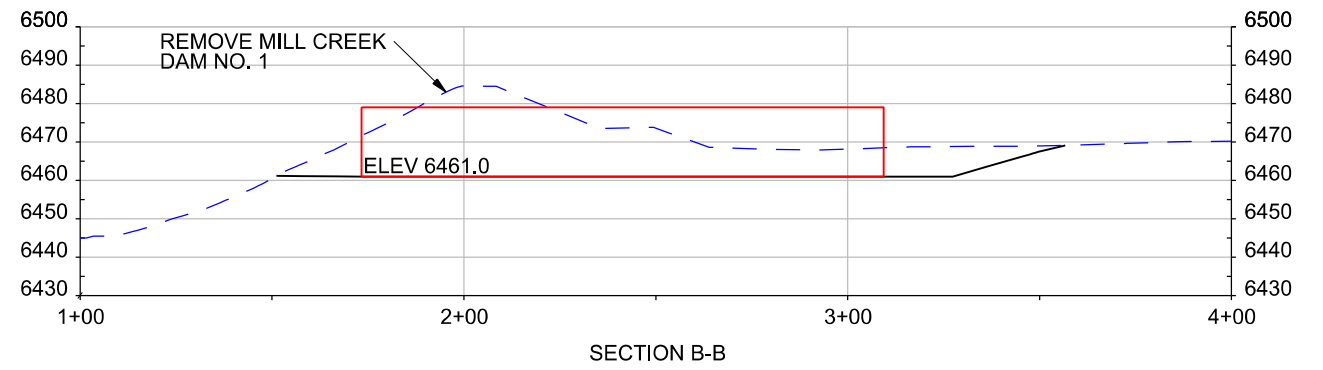
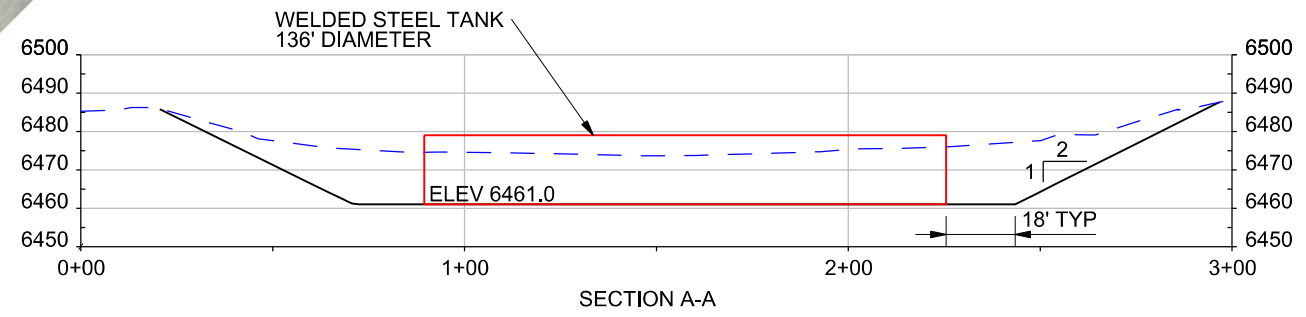


SPOIL DECANT FACILITY TO REMAIN

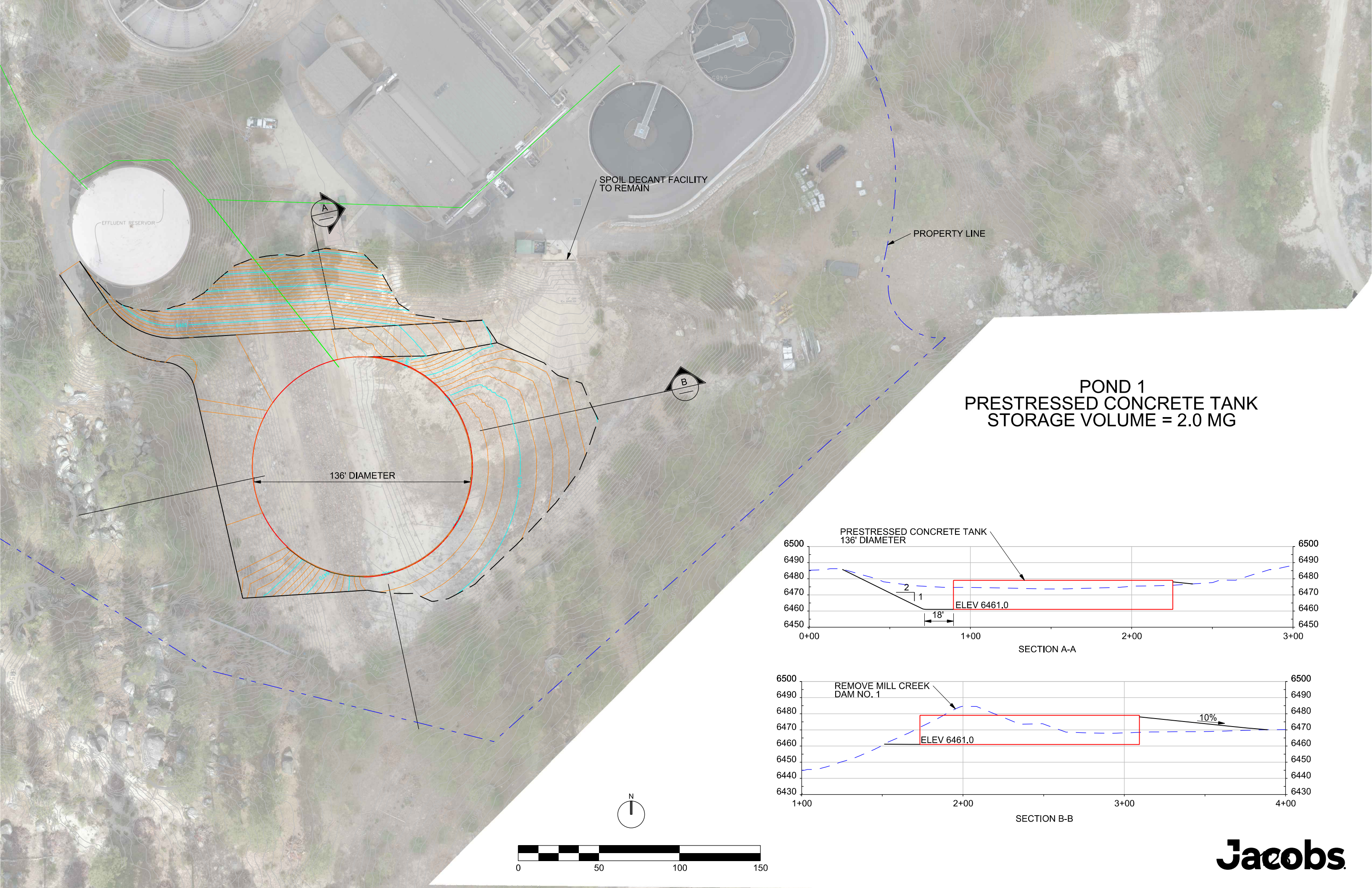
PROPERTY LINE

POND 1  
WELDED STEEL TANK  
STORAGE VOLUME = 2.0 MG

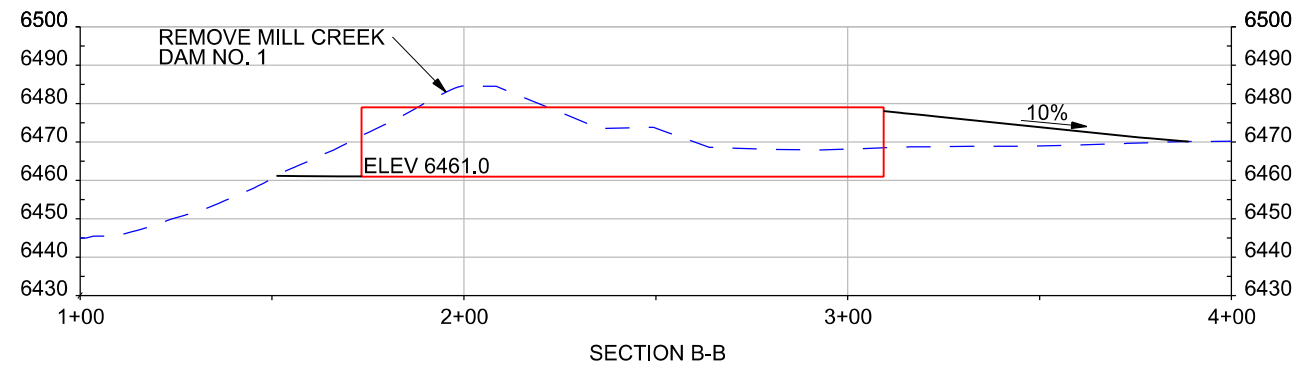
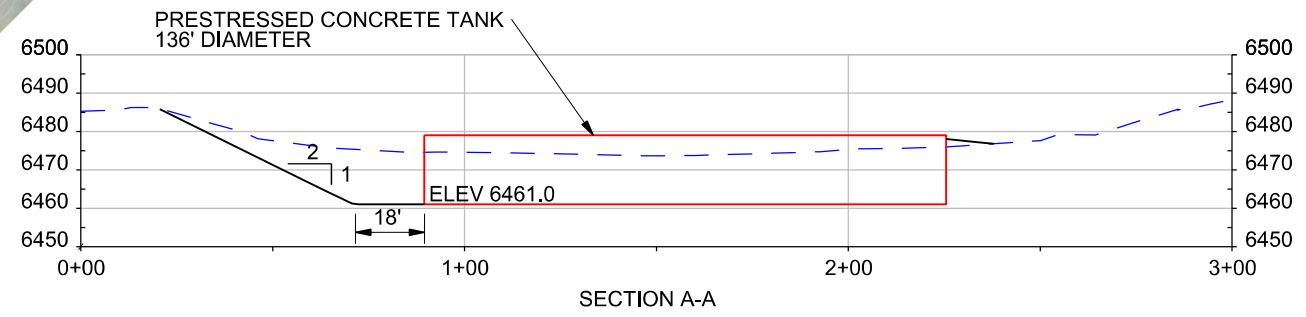
136' DIAMETER



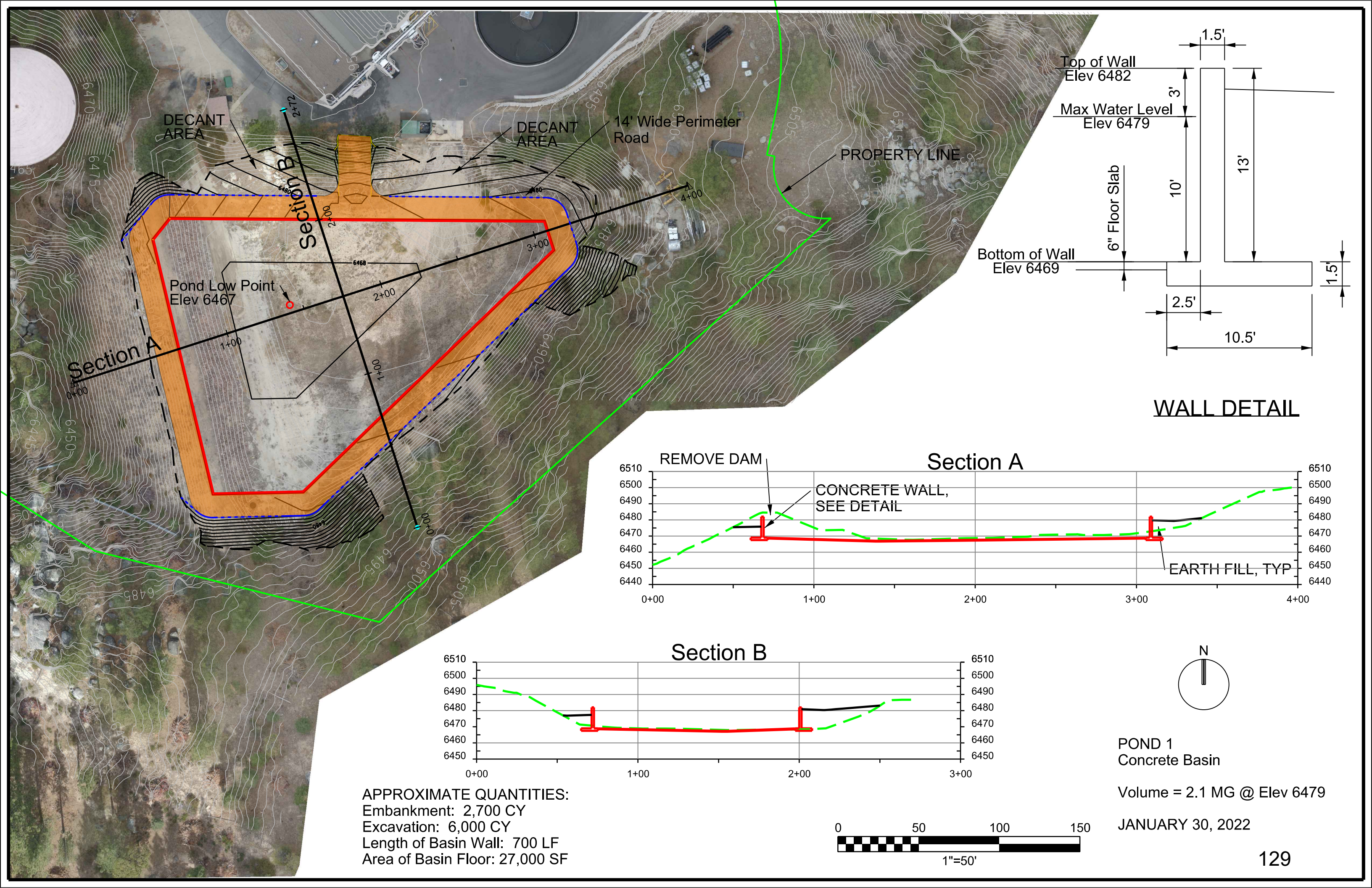




**POND 1  
PRESTRESSED CONCRETE TANK  
STORAGE VOLUME = 2.0 MG**







DECANT AREA

DECANT AREA

14' Wide Perimeter Road

PROPERTY LINE

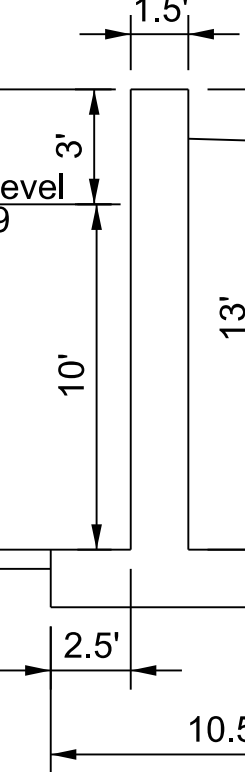
Pond Low Point Elev 6467

Bottom of Wall Elev 6469

Top of Wall Elev 6482

Max Water Level Elev 6479

6" Floor Slab



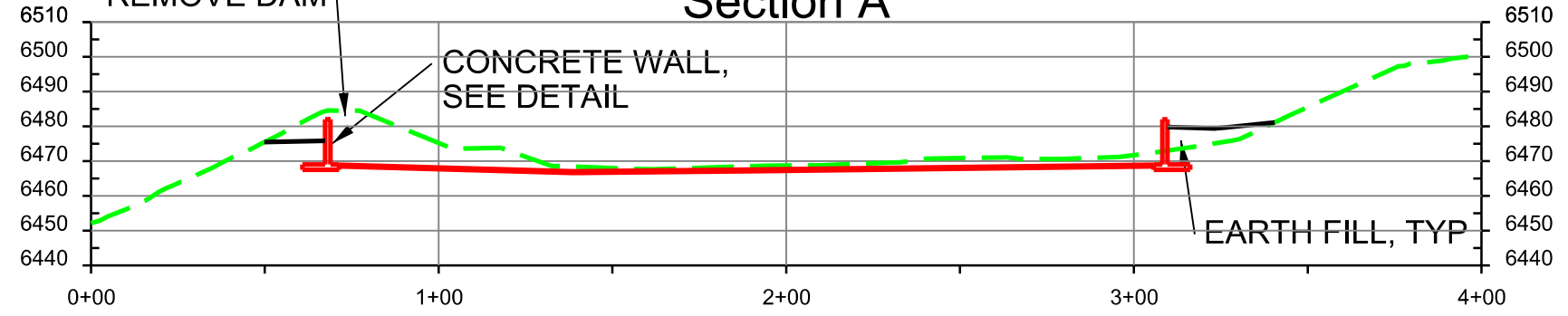
**WALL DETAIL**

Section A

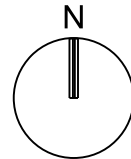
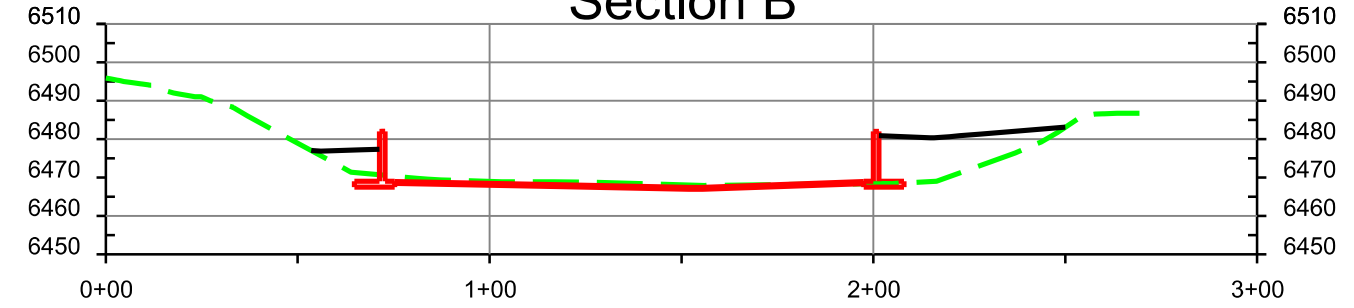
Section B

REMOVE DAM

Section A



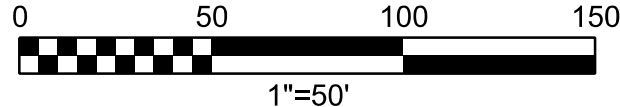
Section B



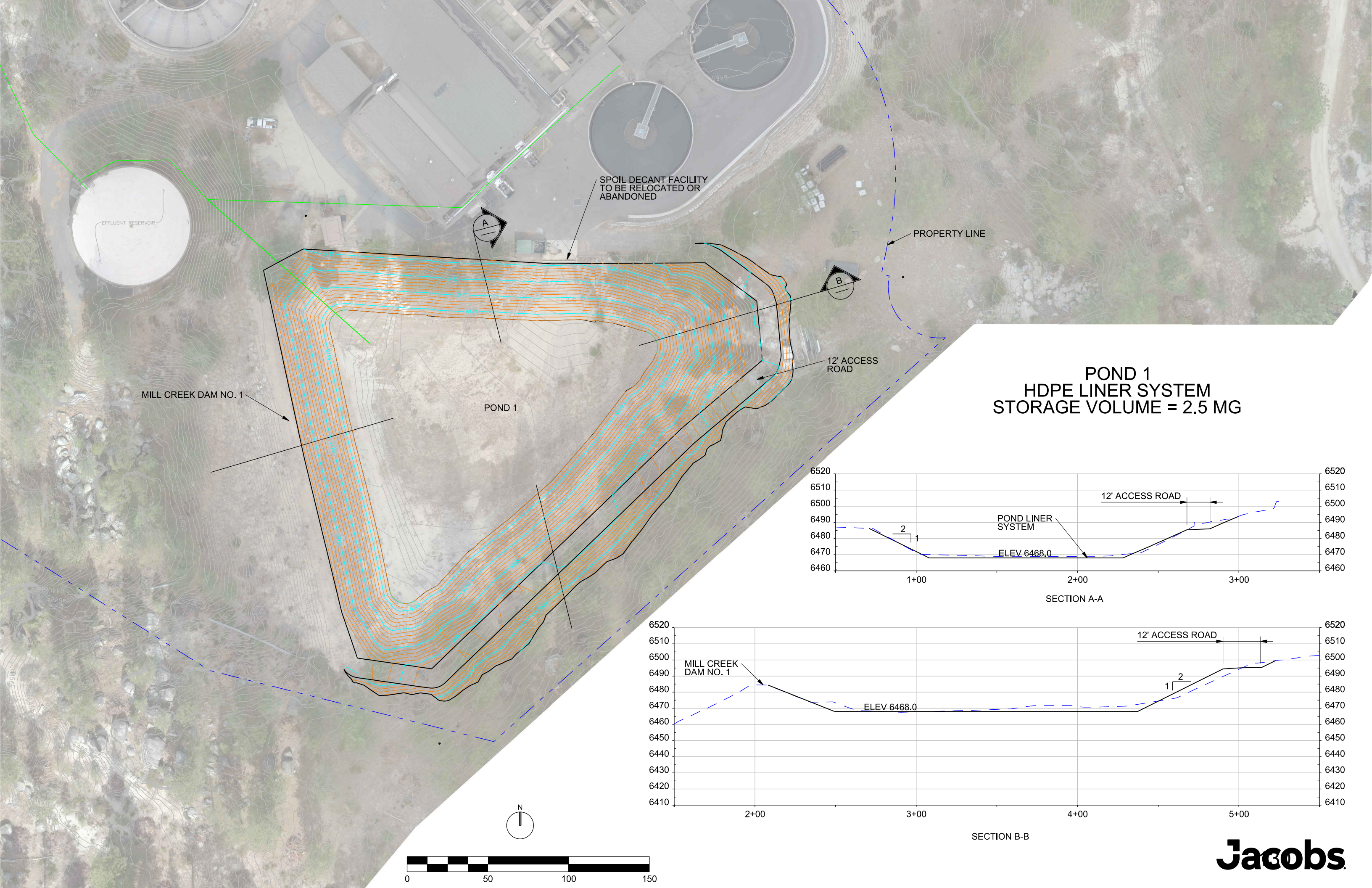
APPROXIMATE QUANTITIES:  
 Embankment: 2,700 CY  
 Excavation: 6,000 CY  
 Length of Basin Wall: 700 LF  
 Area of Basin Floor: 27,000 SF

POND 1  
 Concrete Basin  
 Volume = 2.1 MG @ Elev 6479

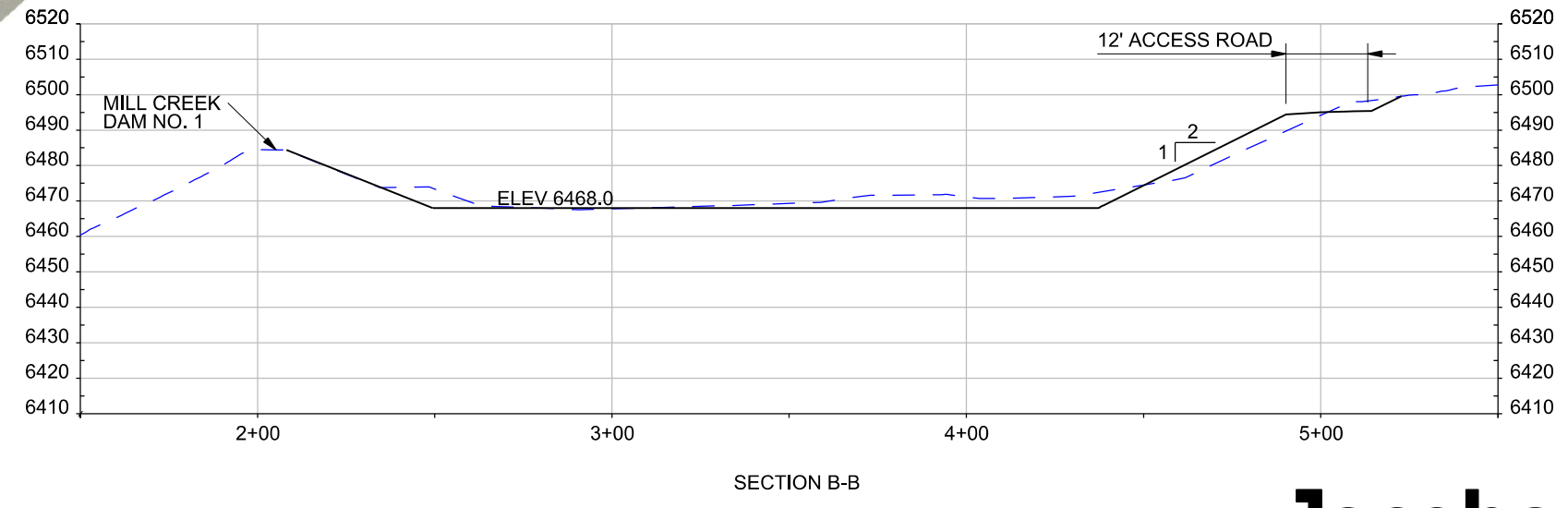
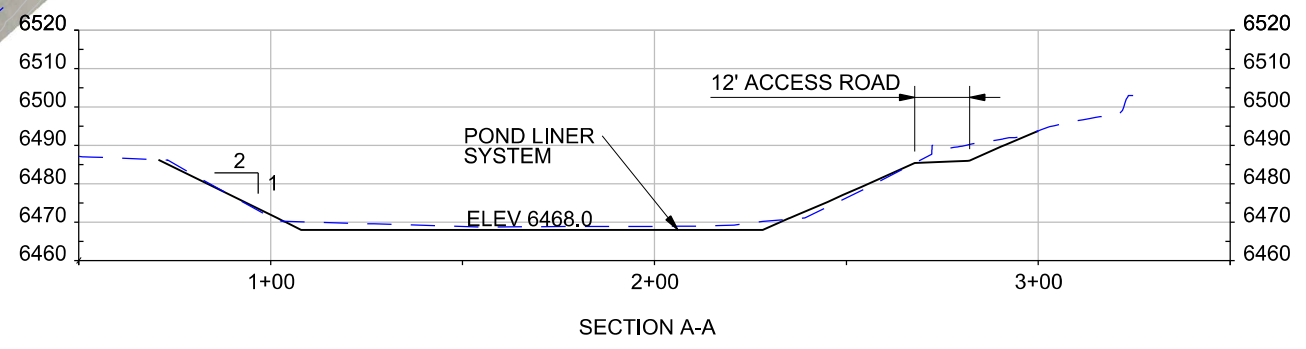
JANUARY 30, 2022







**POND 1**  
**HDPE LINER SYSTEM**  
**STORAGE VOLUME = 2.5 MG**





<b>DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)</b>				
<i>Project</i>	IVGID Effluent Pond Lining Project		<i>Computed</i>	Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)		<i>Date</i>	2/16/2022
<i>Task</i>	Pre-Design Cost Estimate - Welded Steel Tank		<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
<b>GENERAL REQUIREMENTS</b>				
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 510,090.00	\$ 510,090.00
Insurance and Bonds	1.00	LS	\$ 24,915.00	\$ 24,915.00
<b>SUBTOTAL</b>				<b>\$ 535,005.00</b>
<b>Pond Earthwork</b>				
Clear & Grub	1.20	AC	\$ 53,750.00	\$ 64,500.00
Site Access Road	250.00	LF	\$ 190.00	\$ 47,500.00
Excavation (Export)	17,500.00	CY	\$ 72.00	\$ 1,260,000.00
Embankment (Import To Fill)	-	CY	\$ -	\$ -
Subgrade Material (6" Under Tank)	300.00	CY	\$ 128.50	\$ 38,550.00
Maintenance Road Surfacing (6" Aggregate Base)	575.00	CY	\$ 115.00	\$ 66,125.00
<b>SUBTOTAL</b>				<b>\$ 1,476,675.00</b>
<b>Effluent Storage</b>				
Welded Steel Tank (136' Dia, 20' Height)	1.00	EACH	\$ 2,730,000.00	\$ 2,730,000.00
16" Effluent Piping	125.00	LF	\$ 545.00	\$ 68,125.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 50,000.00	\$ 50,000.00
<b>SUBTOTAL</b>				<b>\$ 2,848,125.00</b>
<b>Subtotal 1</b>				<b>\$4,859,805</b>
Contractor Overhead and Profit (14% of Subtotal 1)				\$680,373
<b>Subtotal 2</b>				<b>\$5,540,178</b>
Construction Contingencies (15% of Subtotal 1)				\$ 728,970.75
Design				\$ 400,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 75,000.00
<b>Subtotal 3</b>				<b>\$ 1,653,970.75</b>
TRPA Coverage Fee (1.5x14,600 sf @ \$50/SF)				\$ 1,095,000.00
<b>TOTAL ESTIMATED PROJECT CONSTRUCTION COST</b>				<b>\$ 7,194,148.45</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$ 8,289,148.45</b>

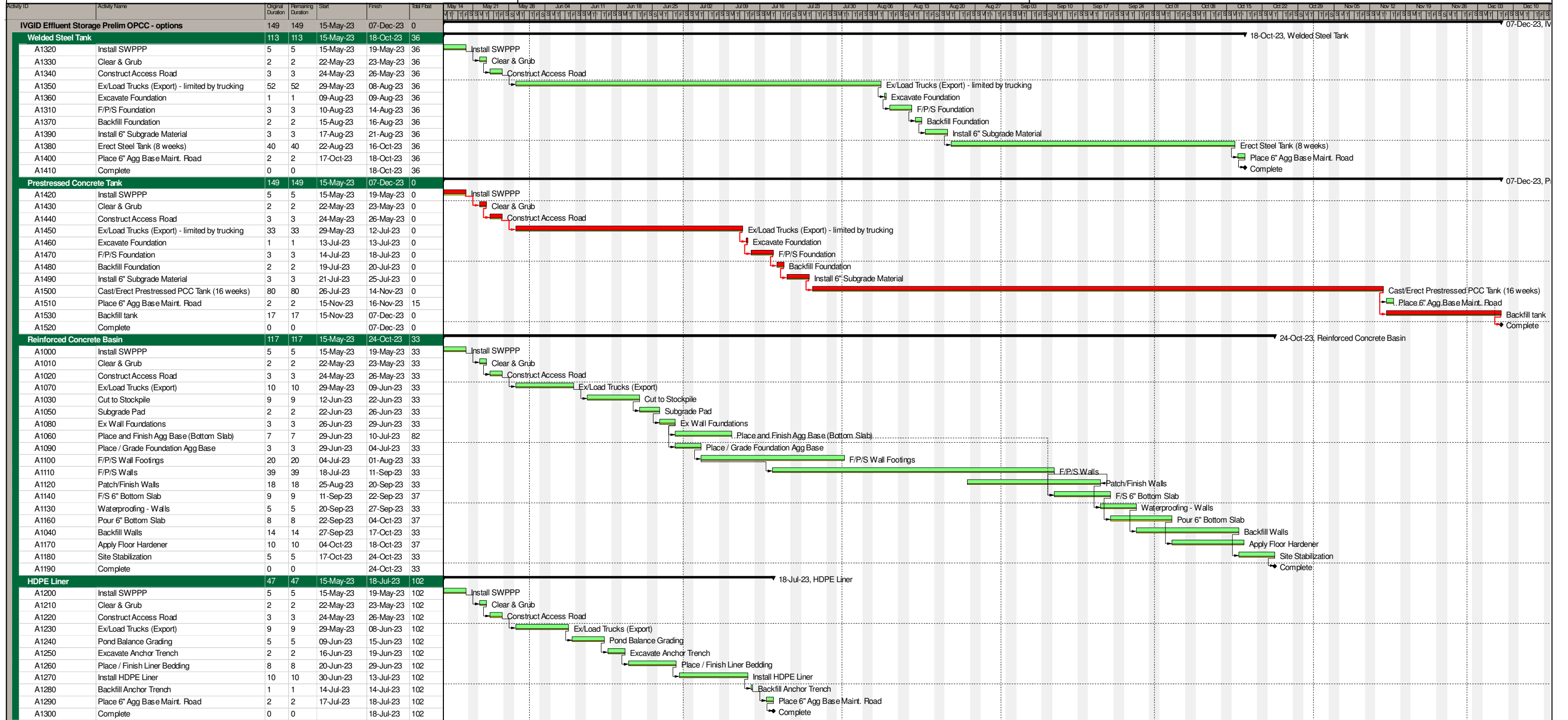
<b>DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)</b>				
<i>Project</i>	IVGID Effluent Pond Lining Project		<i>Computed</i>	Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)		<i>Date</i>	2/16/2022
<i>Task</i>	Pre-Design Cost Estimate - Prestressed Concrete Tank		<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
<b>GENERAL REQUIREMENTS</b>				
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 619,936.00	\$ 619,936.00
Insurance and Bonds	1.00	LS	\$ 22,272.00	\$ 22,272.00
<b>SUBTOTAL</b>				<b>\$ 642,208.00</b>
<b>Pond Earthwork</b>				
Clear & Grub	1.20	AC	\$ 53,750.00	\$ 64,500.00
Site Access Road	250.00	LF	\$ 190.00	\$ 47,500.00
Excavation (Export)	11,000.00	CY	\$ 72.00	\$ 792,000.00
Excavation (Offhaul to Stkpl, Import to Emb)	6,500.00	CY	\$ 124.00	\$ 806,000.00
Subgrade Material (6" Under Tank)	300.00	CY	\$ 128.50	\$ 38,550.00
Maintenance Road Surfacing (6" Aggregate Base)	575.00	CY	\$ 115.00	\$ 66,125.00
<b>SUBTOTAL</b>				<b>\$ 1,814,675.00</b>
<b>Effluent Storage</b>				
Prestressed Concrete Tank (136' Dia, 18' Height)	1.00	EACH	\$ 1,769,300.00	\$ 1,769,300.00
16" Effluent Piping	125.00	LF	\$ 545.00	\$ 68,125.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 50,000.00	\$ 50,000.00
<b>SUBTOTAL</b>				<b>\$ 1,887,425.00</b>
<b>Subtotal 1</b>				<b>\$4,344,308</b>
Contractor Overhead and Profit (14% of Subtotal 1)				\$608,203
<b>Subtotal 2</b>				<b>\$4,952,511</b>
Construction Contingencies (15% of Subtotal 1)				\$ 651,646.20
Design				\$ 400,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 75,000.00
<b>Subtotal 3</b>				<b>\$ 1,576,646.20</b>
TRPA Coverage Fee (1.5x14,600 sf @ \$50/SF)				\$ 1,095,000.00
<b>TOTAL ESTIMATED PROJECT CONSTRUCTION COST</b>				<b>\$ 6,529,157.32</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$ 7,624,157.32</b>

<b>DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)</b>				
<i>Project</i>	IVGID Effluent Pond Lining Project		<i>Computed</i>	Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)		<i>Date</i>	2/16/2022
<i>Task</i>	Pre-Design Cost Estimate - Reinforced Concrete Basin		<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
<b>GENERAL REQUIREMENTS</b>				
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 751,496.00	\$ 751,496.00
Insurance and Bonds	1.00	LS	\$ 20,152.00	\$ 20,152.00
SUBTOTAL				<b>\$ 771,648.00</b>
<b>Pond Earthwork</b>				
Clear & Grub	1.20	AC	\$ 53,750.00	\$ 64,500.00
Site Access Road	250.00	LF	\$ 190.00	\$ 47,500.00
Excavation (Offhaul to Stkpl, Import to Emb)	2,700.00	CY	\$ 169.00	\$ 456,300.00
Excavation (Export)	3,300.00	CY	\$ 94.00	\$ 310,200.00
Maintenance Road Surfacing (6" Aggregate Base)	210.00	CY	\$ 180.00	\$ 37,800.00
SUBTOTAL				<b>\$ 916,300.00</b>
<b>Effluent Storage</b>				
CIP Reinforced Concrete Walls (H = 13')	700.00	LF	\$ 1,850.00	\$ 1,295,000.00
Reinforced Concrete Bottom Slab (6")	27,000.00	SF	\$ 30.00	\$ 810,000.00
16" Effluent Piping	125.00	LF	\$ 545.00	\$ 68,125.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 50,000.00	\$ 50,000.00
SUBTOTAL				<b>\$ 2,223,125.00</b>
<b>Pond Security and Safety</b>				
8' Wildlife Chainlink Fence	975.00	LF	\$ 60.00	\$ 58,500.00
8' - 12' Wide Double Swing Gate	1.00	EACH	\$ 3,500.00	\$ 3,500.00
Security Signage	4.00	EACH	\$ 300.00	\$ 1,200.00
SUBTOTAL				<b>\$ 63,200.00</b>
<b>Subtotal 1</b>				<b>\$3,974,273</b>
Contractor Overhead and Profit (14% of Subtotal 1)				\$556,398
<b>Subtotal 2</b>				<b>\$4,530,671</b>
Construction Contingencies (15% of Subtotal 1)				\$ 596,140.95
Design				\$ 400,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 75,000.00
<b>Subtotal 3</b>				<b>\$ 1,521,140.95</b>
TRPA Coverage Fee (1.5x28,000 sf @ \$50/SF)				\$ 2,100,000.00
<b>TOTAL ESTIMATED PROJECT CONSTRUCTION COST</b>				<b>\$ 6,051,812.17</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$ 8,151,812.17</b>

<b>DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)</b>				
<i>Project</i>	IVGID Effluent Pond Lining Project		<i>Computed</i>	Jacobs/Granite
<i>Subject</i>	DRAFT Preliminary - Opinion Of Probable Construction Cost (OPCC)		<i>Date</i>	2/22/2022
<i>Task</i>	Pre-Design Cost Estimate - HDPE Pond Liner		<i>Reviewed</i>	
	QUANTITY	UNITS	UNIT PRICE	TOTAL COST
<b>GENERAL REQUIREMENTS</b>				
Mobilization/Demobilization and General Conditions	1.00	LS	\$ 341,555.00	\$ 341,555.00
Insurance and Bonds	1.00	LS	\$ 6,828.00	\$ 6,828.00
SUBTOTAL				<b>\$ 348,383.00</b>
<b>Pond Earthwork</b>				
Clear & Grub	1.20	AC	\$ 53,750.00	\$ 64,500.00
Site Access Road	250.00	LF	\$ 190.00	\$ 47,500.00
Pond Re-Grading	1,000.00	CY	\$ 44.00	\$ 44,000.00
Excavation (Export)	3,000.00	CY	\$ 73.50	\$ 220,500.00
Liner Bedding	450.00	CY	\$ 214.00	\$ 96,300.00
Maintenance Road Surfacing (6" Aggregate Base)	100.00	CY	\$ 195.00	\$ 19,500.00
SUBTOTAL				<b>\$ 492,300.00</b>
<b>Effluent Storage</b>				
Install Pond Liner	61,000.00	SF	\$ 5.06	\$ 308,660.00
16" Effluent Piping	125.00	LF	\$ 545.00	\$ 68,125.00
Tee Into Existing Pipeline/Valving	1.00	LS	\$ 50,000.00	\$ 50,000.00
SUBTOTAL				<b>\$ 426,785.00</b>
<b>Pond Security and Safety</b>				
8' Wildlife Chainlink Fence	975.00	LF	\$ 60.00	\$ 58,500.00
8' - 12' Wide Double Swing Gate	1.00	EACH	\$ 3,500.00	\$ 3,500.00
Security Signage	4.00	EACH	\$ 300.00	\$ 1,200.00
SUBTOTAL				<b>\$ 63,200.00</b>
<b>Subtotal 1</b>				<b>\$1,330,668</b>
Contractor Overhead and Profit (14% of Subtotal 1)				\$186,294
<b>Subtotal 2</b>				<b>\$1,516,962</b>
Construction Contingencies (15% of Subtotal 1)				\$ 199,600.20
Design				\$ 350,000.00
Administrative Costs				\$ 250,000.00
Construction Management				\$ 200,000.00
Environmental Documentation and Permitting				\$ 75,000.00
<b>Subtotal 3</b>				<b>\$ 1,074,600.20</b>
TRPA Coverage Fee (1.5x52,000sf @ \$50/SF)				\$ 3,900,000.00
<b>TOTAL ESTIMATED PROJECT CONSTRUCTION COST</b>				<b>\$ 2,591,561.72</b>
<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$ 6,491,561.72</b>



# IVGID CMAR - Effluent Storage Options Preliminary OPCC's



█ Remaining Level of Effort   
 █ Primary Baseline   
 █ Third Baseline   
 █ Remaining Work   
 ◆ Milestone  
█ Actual Level of Effort   
 █ Second Baseline   
█ Actual Work   
█ Critical Remaining Work   
 ◀▶ Summary



## Project Summary

<b>Project Number:</b>	2599SS2010
<b>Title:</b>	Effluent Pond Lining Project
<b>Project Type:</b>	D - Capital Improvement - Existing Facilities
<b>Division:</b>	99 - General Administration - Sewer
<b>Budget Year:</b>	2022
<b>Finance Options:</b>	
<b>Asset Type:</b>	SS - Sewer System
<b>Active:</b>	No

<b>Project Description</b>				
Line the 2.4 million gallon effluent storage pond at the Water Resource Recovery Facility (WRRF) with reinforced concrete or the combination of concrete and shotcrete lining as recommended in the WRRF Effluent Storage Alternative Analysis Memorandum, prepared by Jacobs Engineering, dated September 2018.				
<b>Project Internal Staff</b>				
The engineering division will support this project. Outside consultants will be used for design and management. The project will be publicly advertised in accordance with NRS 338.				
<b>Project Justification</b>				
The effluent pond is a 2.4 million gallon effluent storage basin located directly adjacent to the Water Resource Recovery Facility (WRRF). This storage basin was designed to provide automated and passive back-up effluent storage in the event the Plant's 500,000-gallon effluent storage tank fills to capacity. As a condition of IVGID's current operating permit with the Nevada Department of Environmental Protection (NDEP), IVGID is no longer permitted to utilize this storage basin for effluent storage due to it being unlined. Lining the pond will allow IVGID to return the pond into the operating plan with NDEP and provide greater protection to Lake Tahoe.				
<b>Forecast</b>				
<b>Budget Year</b>	<b>Total Expense</b>	<b>Total Revenue</b>	<b>Difference</b>	
2022				
Carry Forward from FYE 6.30.2021 from CIP 2524SS1010 Effluent Pipeline Project	1,550,000	0	1,550,000	
Year Total	1,550,000	0	1,550,000	
	<b>1,550,000</b>	<b>0</b>	<b>1,550,000</b>	
<b>Year Identified</b>	<b>Start Date</b>	<b>Est. Completion Date</b>	<b>Manager</b>	<b>Project Partner</b>
2020	Jul 1, 2020	Jun 30, 2023	Engineering Manager	

# IVGID Effluent Export Pond Lining

Project Update and Effluent Storage Alternatives

Board of Trustees meeting – March 1, 2022



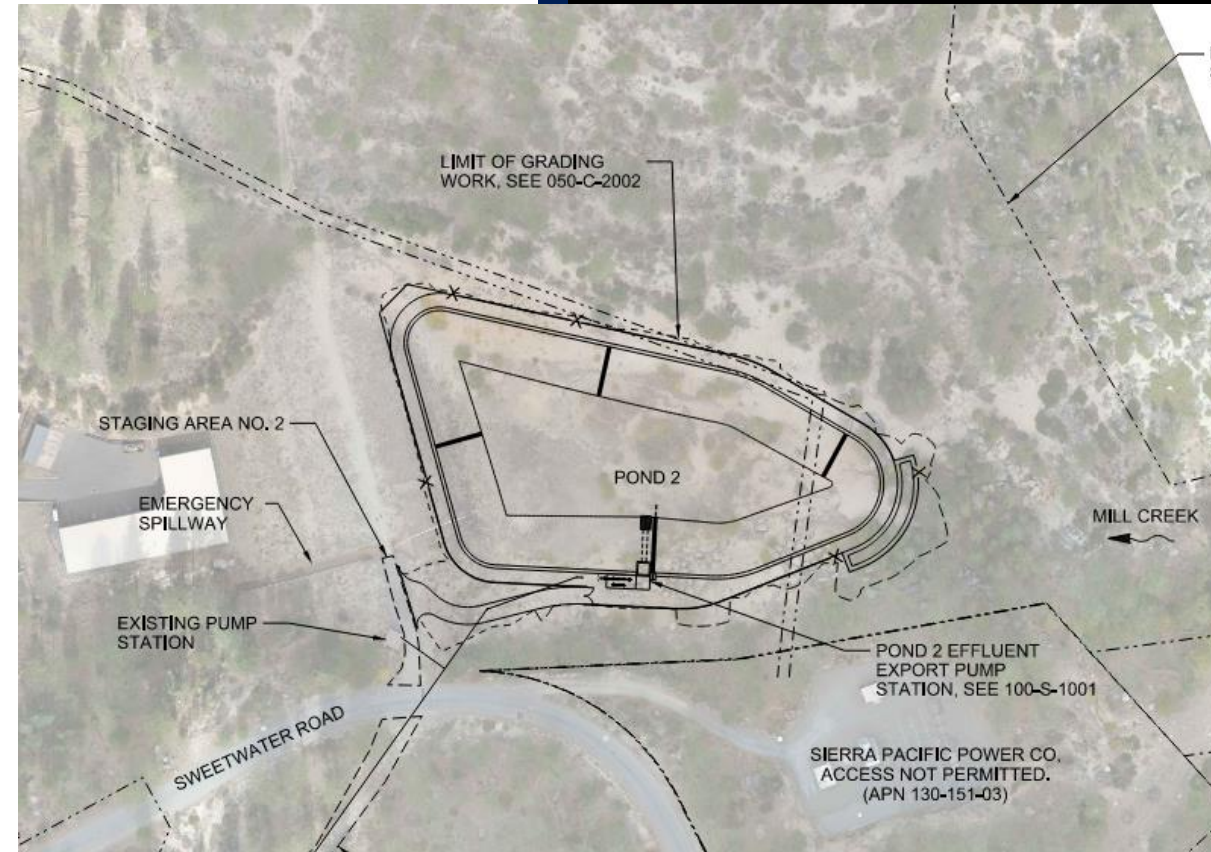
# IVGID Effluent Export Pond Lining



# Project Background

## Effluent Export Lining – Pond 2

- **Original design**
  - Pond #2 – HDPE liner and Pump station
  - 6MG storage capacity allowance
- **Regulatory correspondence - design requirements:**
  - *NV DWR*
    - Jacobs given preliminary indication a Notice of Construction was anticipated (vs. Approval of Dam Plans)
    - At 60% plan review – Jacobs notified full analysis req'd with Dam Permit including spillway improvements
  - *TRPA*
    - Lining Pond #2 or Pond #1 triggers substantial SEZ Coverage requirements
    - Mitigation at 1.5:1
  - *NDEP*
    - Guidelines for lining requirements (WTS-37, WTS-5)
- **Design Revisions & Alternatives**
  - CMAR Team begins review of Pond 1 Storage Alternatives
  - Consider temporary lining of Pond 2 to support export pipeline construction.



# Pond 1 Permanent Effluent Storage Alternatives

- IVGID must provide a permanent effluent storage option to meet operating permit requirements
- Preliminary Design and Estimates presented are pre-30% level
- Four Alternatives considered:

- HDPE Liner
- Welded Steel Tank
- Prestressed Concrete Tank
- Reinforced Concrete Basin

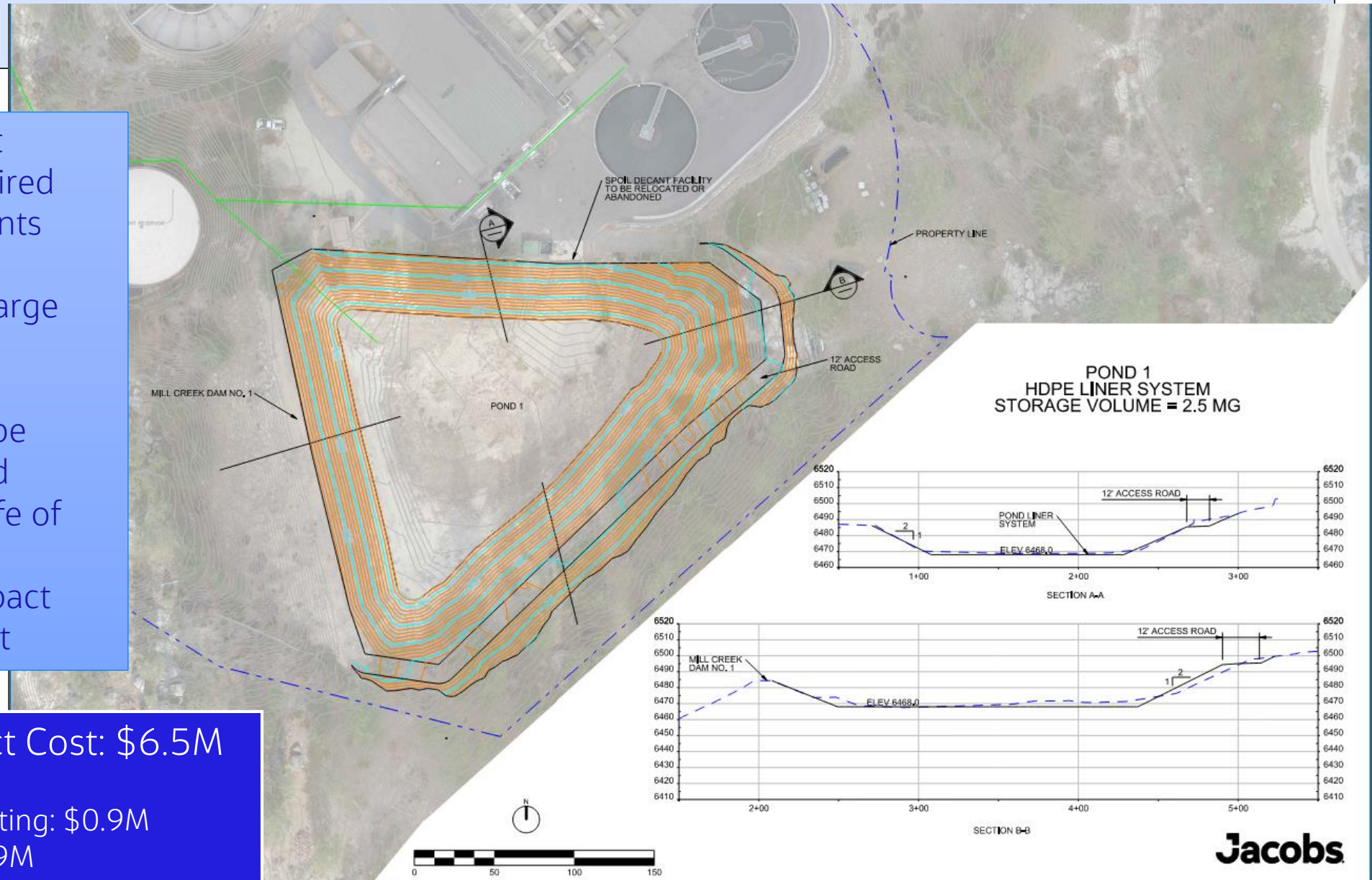


# HDPE Liner

- ❑ Lower initial investment
- ❑ Limited earthwork required
- ❑ Meets NDEP requirements
- ❑ Stored effluent may be retreated prior to discharge
- ❑ NV DWR design review required
- ❑ Spoil decant facility to be abandoned or relocated
- ❑ Assumed liner design life of 20-30 years
- ❑ Significant financial impact from SEZ Coverage req't

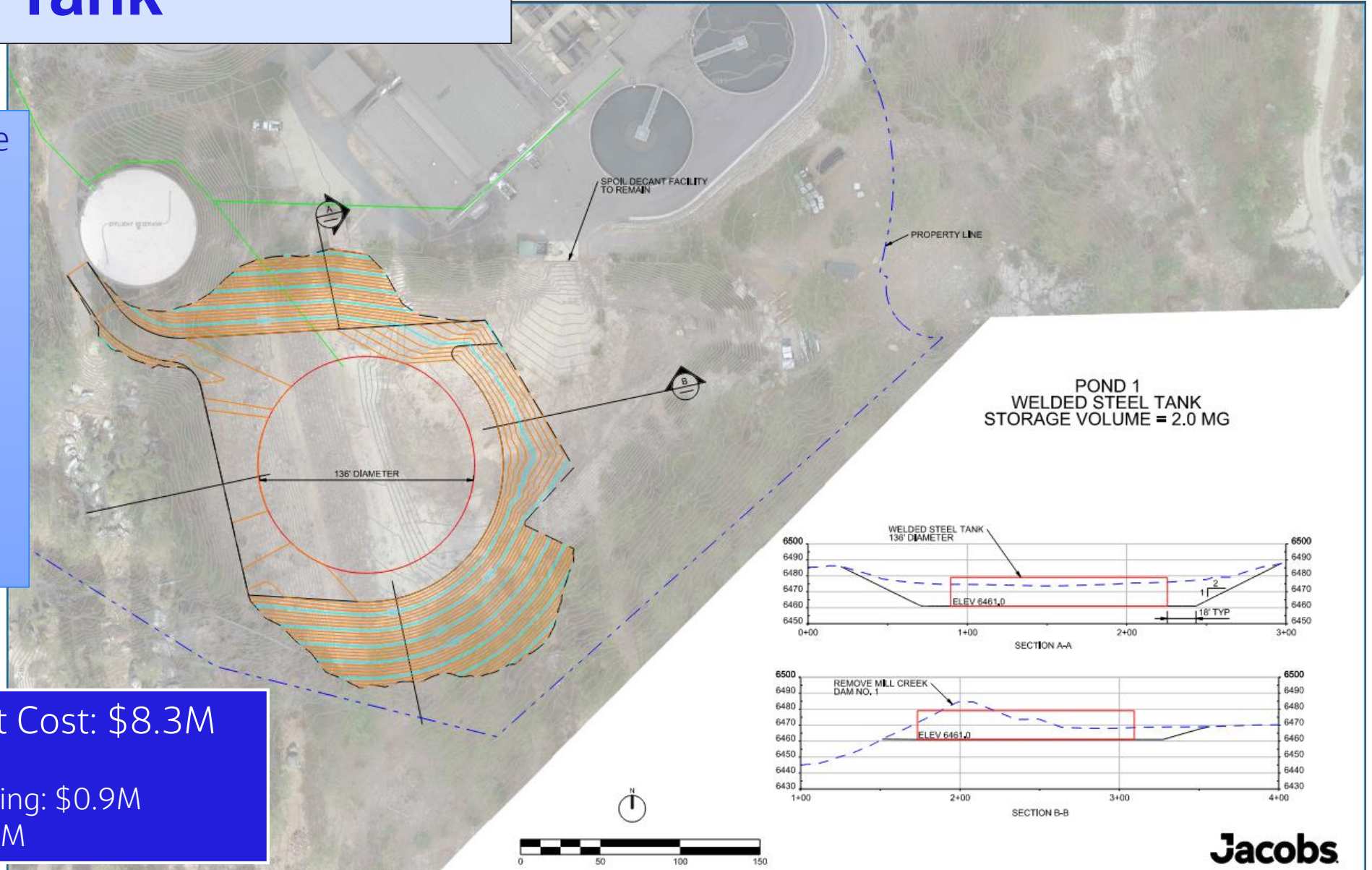
Estimated Total Project Cost: \$6.5M

- Construction: \$1.7M
- Admin, Design, & Permitting: \$0.9M
- TRPA Coverage Fee: \$3.9M



# Welded Steel Tank

- ❑ Familiar effluent storage system (steel tank)
- ❑ Closed system, no re-treatment of effluent required
- ❑ Mill Creek Dam No. 1 decommissioned
- ❑ Spoil decant facility to remain
- ❑ Substantial earthwork export required



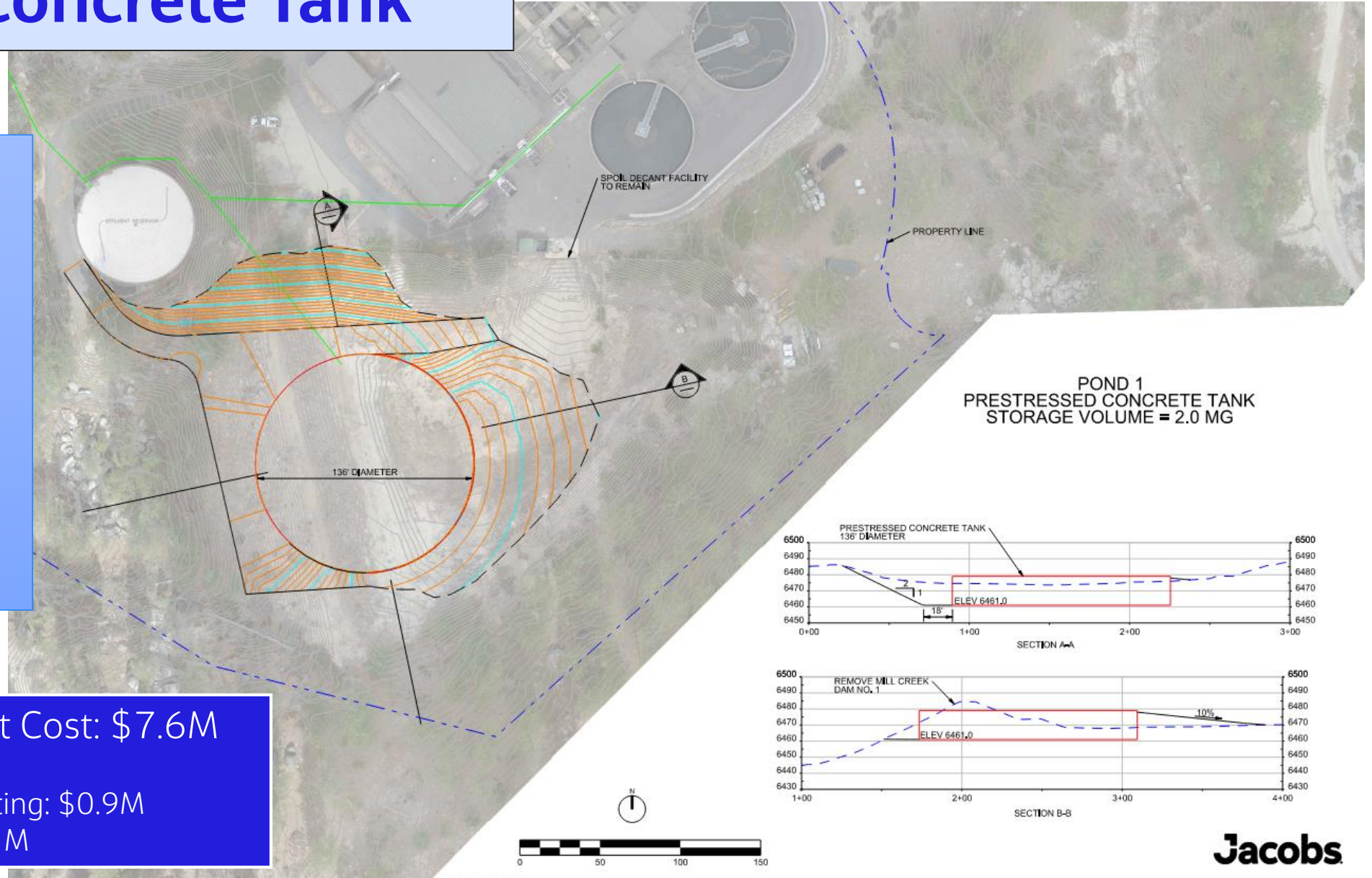
Estimated Total Project Cost: \$8.3M

- Construction: \$6.3M
- Admin, Design, & Permitting: \$0.9M
- TRPA Coverage Fee: \$1.1M



# Prestressed Concrete Tank

- ❑ Similar to existing effluent storage system
- ❑ Closed system, no re-treatment of effluent required
- ❑ Mill Creek Dam No. 1 decommissioned
- ❑ Spoil decant facility to remain
- ❑ Ability to partially bury tank



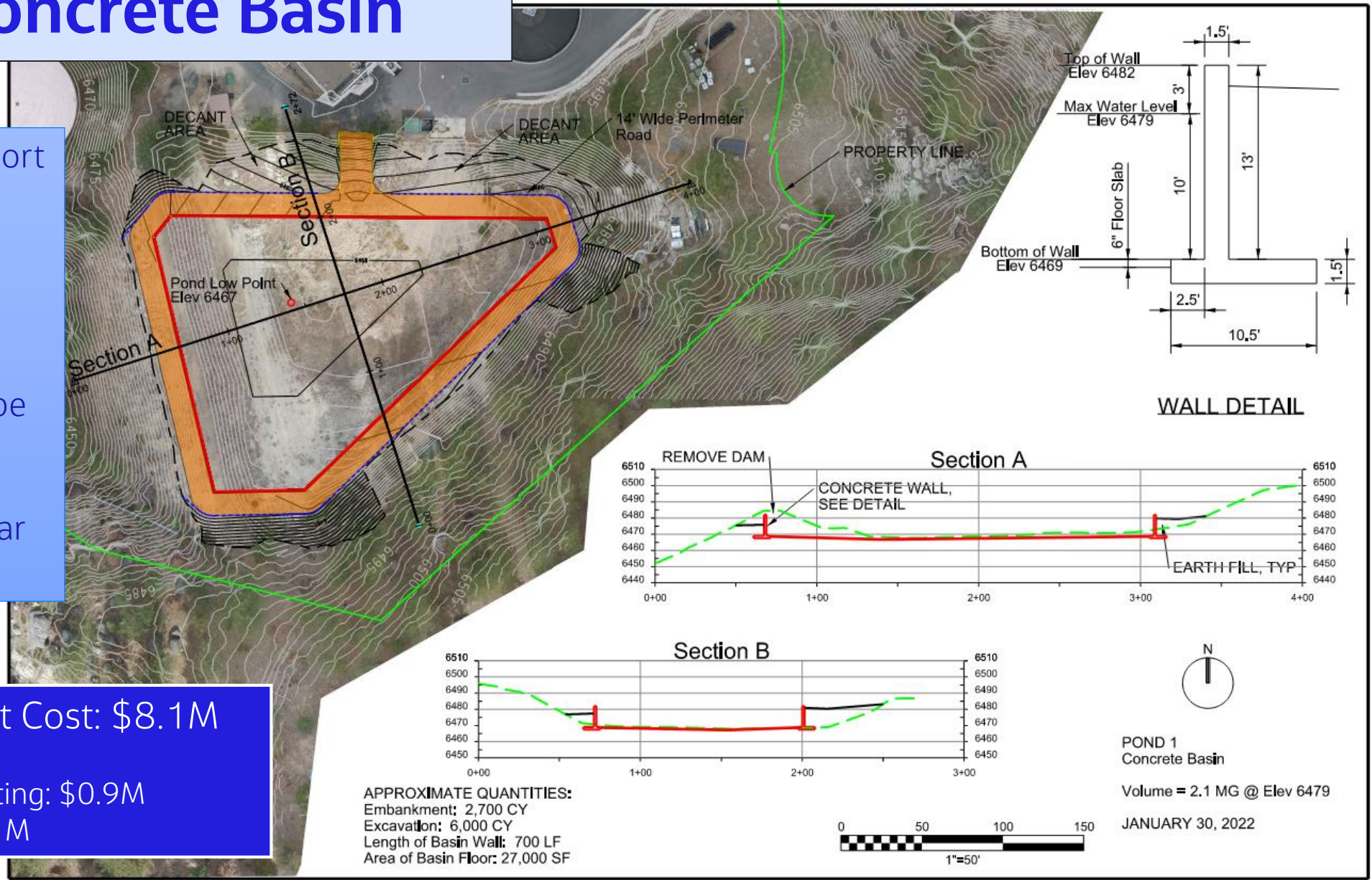
Estimated Total Project Cost: \$7.6M

- Construction: \$5.6M
- Admin, Design, & Permitting: \$0.9M
- TRPA Coverage Fee: \$1.1M



# Reinforced Concrete Basin

- ❑ Reduced earthwork export
- ❑ Mill Creek Dam No. 1 decommissioned
- ❑ Stored effluent may be retreated prior to discharge
- ❑ Spoil decant facility to be relocated
- ❑ Maintenance may be difficult without vehicular access



**Estimated Total Project Cost: \$8.1M**

- Construction: \$5.1M
- Admin, Design, & Permitting: \$0.9M
- TRPA Coverage Fee: \$2.1M

**APPROXIMATE QUANTITIES:**  
 Embankment: 2,700 CY  
 Excavation: 6,000 CY  
 Length of Basin Wall: 700 LF  
 Area of Basin Floor: 27,000 SF

**POND 1  
 Concrete Basin**  
 Volume = 2.1 MG @ Elev 6479  
 JANUARY 30, 2022

# IVGID Effluent Export Pond Lining - CMAR

## CMAR Recommendations:

- Too early in CMAR to determine best value
- Progress Alternatives to 30% Design for more accurate risk analysis and cost estimating
- Review constructability of alternatives
- Evaluate operational goals





# Next Steps

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## Pond 1 Effluent Export Storage

- Jacobs and Granite to provide scope and fee amendment for Pond 1 - 30% Design Alternatives for Board review and approval
- Team to develop and refine the alternatives to 30% Design Level to refine costs, benefits, and risks of alternatives.
- IVGID staff to select and Board to approve preferred alternative for Board approval of Final Design and Construction
- IVGID to progress:
  - Environmental documents
  - US Army Corps Funding agreement
  - TRPA coverage evaluations

# Thank You