DHCWSC Future Water Security Project

Assess our preparedness to drill a test well and evaluate the probability that the site can be converted into a public well able to supply the potable water we require

Bottom Line Up Front

1. *We have identified 3 viable locations for drilling a test well that have a reasonable likelihood of having sufficient water*
2. *Obtaining permissions and rights are in the “doable” category*
3. *Targeting the end of July or early August as completing the test hole*
4. *Resources and planning in place to move forward if test well proves viable*
5. *Backup plan in place in the event the test well doesn’t pan out*

Background

Today's Issue

We cannot meet current demand without purchasing bulk water to supplement existing well output

Root Cause

Drought and local geological changes have significantly impacted Well #3's ability to recharge and contribute to monthly production

Solution

Add a new well to replace Well #3

When feasible determine if Well #3 can be rehabilitated and return as a major source of potable water

Strategy

Near-Term Priorities

Install a new well and remove the necessity for buying bulk water to satisfy demand

Long-Term Priorities

Assess the condition of Well #3 to determine if it can be rehabbed or deepened

Protect existing wells and infrastructure from harm

Develop a geological baseline to support the addition of new wells if needed in the future

Prepare DHCWSC to link with more reliable sources like Marble Falls when it is both financially and technically viable

Today’s Objective

1. Review the geology in our area and the recommended sites for setting a test well
2. Review the rationale for the site selected
3. Understand the risks and constraints associated with drilling the test well
4. Review the project estimated costs and timelines
5. Seek board approval to drill the test well

Key Points

- DHCWSC has collaborated with the necessary Subject Matter Experts to plan, finance, and implement the addition of a new public well to the current system.
  - Phase 1: Identify and drill a test well with adequate capacity and water quality to satisfy future needs.
  - Phase 2: Convert the test well into a state-permitted public well and integrate it with the treatment and distribution infrastructure.
- Dr. Brian Smith, a licensed and experienced geologist has completed a geological survey, resulting in a recommendation for a set of test sites with a strong likelihood of yielding water that meets our standards.
- The Central Texas Groundwater Conservation District needs to approve our test well drilling application.
- Agreements with property owners need to be signed, enabling the commencement of drilling activities.
- Contracts need to be finalized and executed with qualified drilling contractors.
- Potential risks have been evaluated and mitigated where possible, with the understanding that a second test hole might be necessary.
- A financial analysis has been completed, demonstrating a favorable return on investment for members by lowering monthly water bills compared to purchasing bulk water.

Resource Partners

Geology – Dr. Brian Smith

- A seasoned geologist possessing in-depth expertise in the local geology of the Austin region, employing advanced analytical techniques and tools to address area-specific challenges.

Financing – Water Finance Exchange

- WFX is a nonprofit entity that partners with communities, federal and state agencies, philanthropic groups, and the financial sector to identify and implement cost-efficient funding strategies.

Design & Engineering – FloodMark Engineering

- FloodMark is a civil engineering firm focused on the planning, engineering, development, and permitting processes for public water systems.

Legal

1. Put description here

Current Phase-2 Cost Estimates

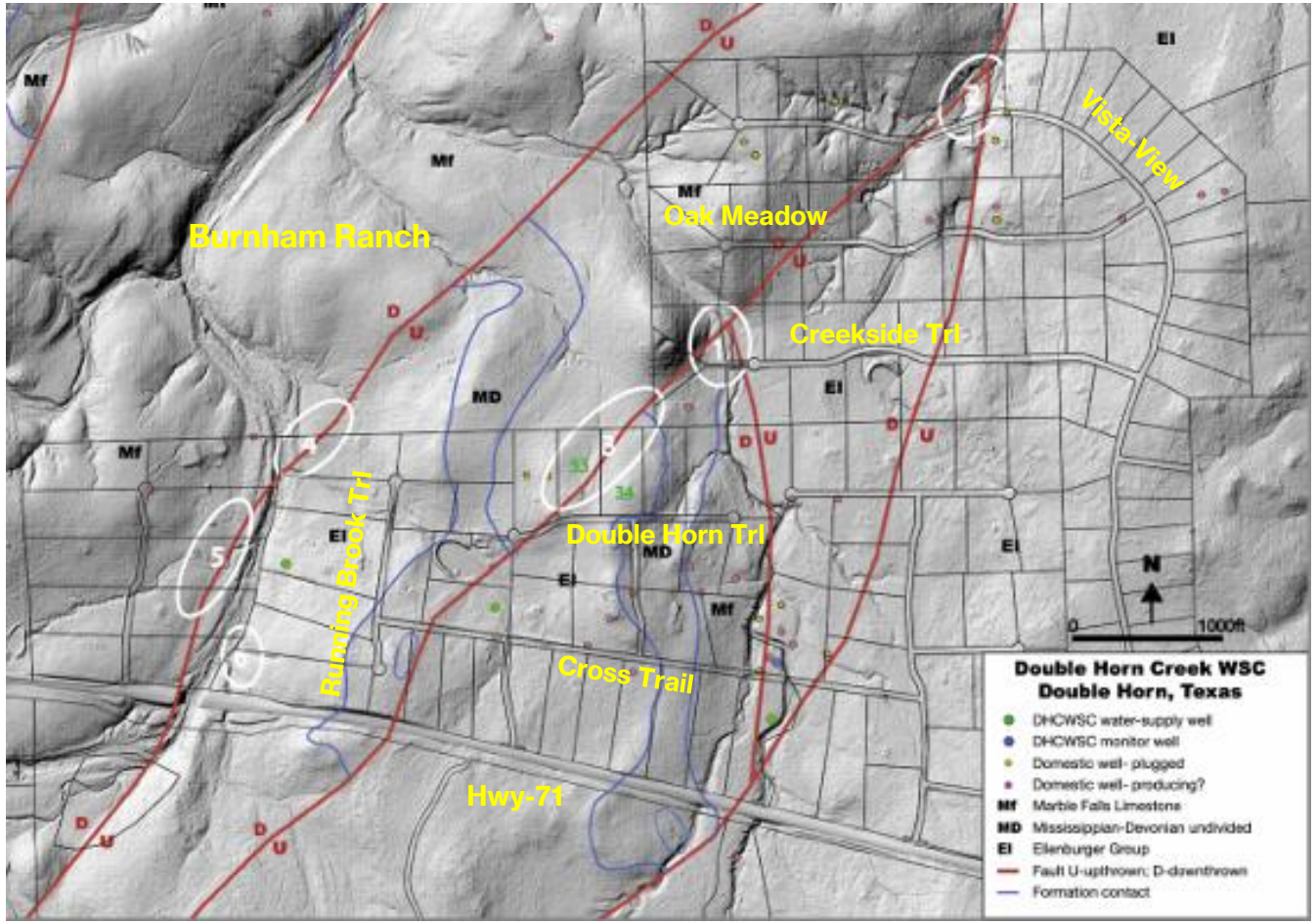
Phase-2 Work Breakdown Structure					
WBS No.	WBS Element Title	Costs			
		Total	Labor	Material	Other
1	Phase 2 Cost	$1,829,350.13	$ 1,100,533.85	$ 96,775.08	$ 632,041.20
1.1	Lease, Permits & Permissions	$ 54,928.75	$ 35,928.75	$ -	$ 19,000.00
1.2	Public Well System Engineering	$ 87,087.00	$ 79,579.50	$ -	$ 7,507.50
1.3	Public Well System Construction	$ 802,085.36	$ 208,488.21	$ 84,152.25	$ 509,444.90
1.4	Project Administration	$ 646,638.14	$ 632,989.50	$ -	$ 13,648.64
1.5	Estimating Judgement	$ 238,610.89	$ 143,547.89	$ 12,622.84	$ 82,440.16

30-year Loan Estimates		
	Federal Rates	Subsidized Rates
Loan Principal	$ 1,829,350.13	$ 1,829,350.13
Interest Rate	6.770%	5.770%
Loan Term	$ 30.00	$ 30.00
Total Obligation	$ 4,320,883.86	$ 3,889,384.44
Annual Payment	$ 144,029.46	$ 129,646.15
Monthly Payment	$ 12,002.46	$ 10,803.85
Annually Per Meter	$ 1,125.23	$ 1,012.86
Monthly Per Meter	$ 93.77	$ 84.41

- The estimated cost for Phase-2 currently ranges from $1.6 million to $1.9 million.
- Based on the loan terms, members can expect to pay an extra $85 to $95 per month each over the 30-year loan duration.
- This remains a cost-effective option compared to the $175 monthly per member expense for purchasing bulk water during the same period.

Overview of the Geology in Double Horn

- Area within Double Horn contains multiple faults
- Faulting and associated fracturing generally increase the permeability and flow rates in the low porosity limestones and dolomites of the Ellenberger-San Saba Aquifer
- Movement of water through these fractures has increased some of the fracture openings due to dissolution of the limestone and dolomite and has increased the permeability.
- An optimum location for drilling a test well would be where two faults come together which should increase the number of fractures intersected by the borehole.
- An estimate of how much water a well could produce at one of these locations is not possible due to the considerable variability of aquifer permeability in the Ellenberger and the lack of detailed subsurface data for this area.



Information and graphic taken from Dr. Smith's report

Viable locations

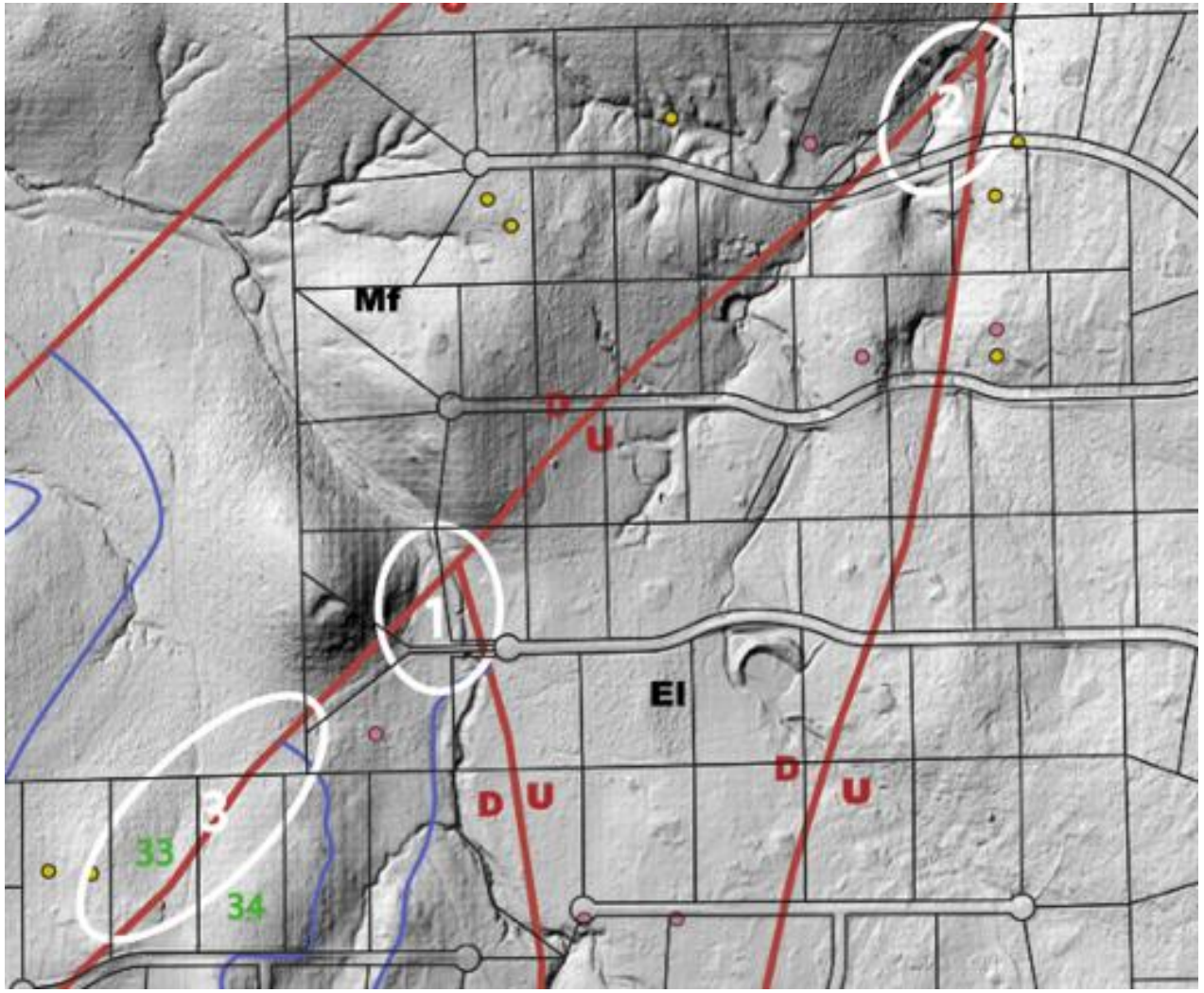
Locations 1 and 2 are at the intersection of two faults and are optimum locations for locating water

Location 3 is another viable location due to its relatively close proximity to Location 1 and the water treatment facility

Although exact probabilities cannot be determined without sufficient subsurface data -

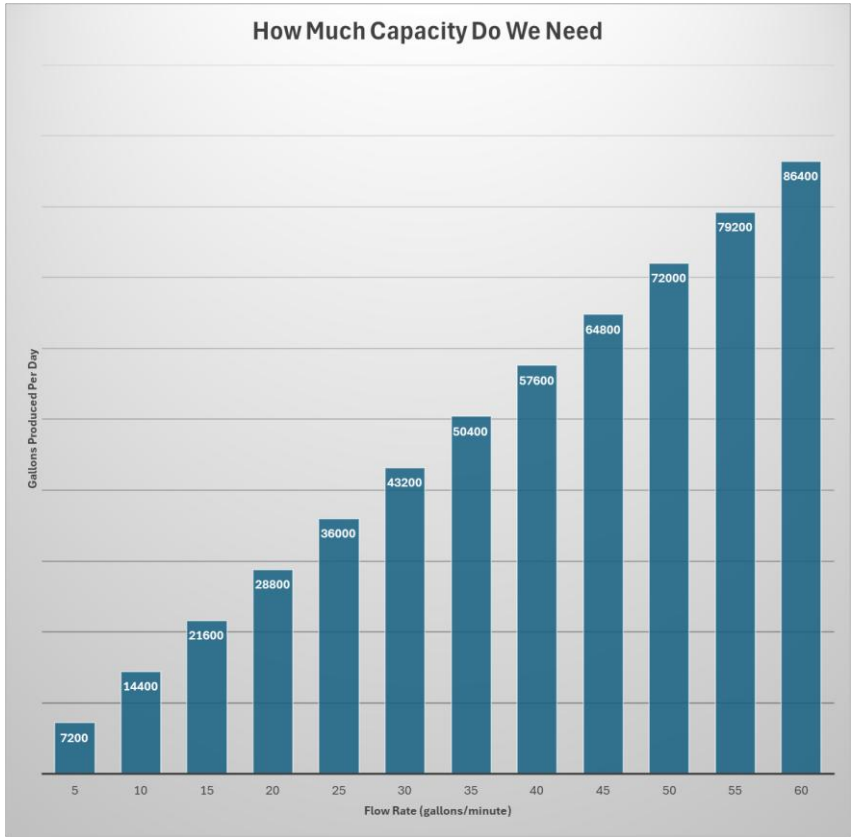
The difference between a site at the intersection of two faults over one at a single fault zone does increase the likelihood of water enough to assign it a higher priority

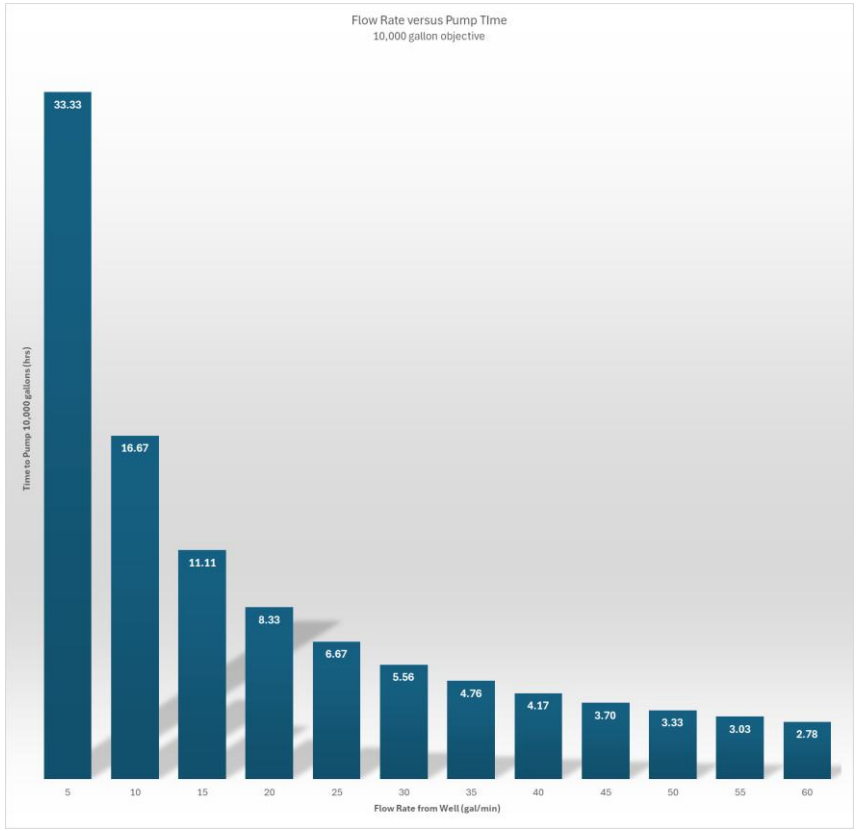
Locations 1 & 2 have a slightly larger expectation of finding water over Location 3 and hence a higher priority in the decision matrix



Graphic taken from Dr. Smith's report

How Much Capacity Do We Need?





- We are currently purchasing 10,000 gallons of bulk water each weekday or approx. 200,000 gallons per month
- A well with a flow rate of 30 gal/min can produce 10,000 gallon in less than 6 hours providing sufficient time for the well to recover and not over stress the pump
- A 30-gal/min flow rate can easily support 300,000 gallons per month exceeding our minimum needs without stressing the well or the pump

Trenching Cost Analysis

Lot	Distance to Facility	Estimating Factor	Planning Distance	% Limestone	% Dolomite	Est Road Boring Cost	Estimated Trenching Cost	Total Cost
Location 3	1,972	10%	2,169	65%	35%	$ -	$ 37,961.00	$ 37,961.00
Location 1	3,564	12%	3,992	65%	35%	$ -	$ 69,854.40	$ 69,854.40
Location 2	6,970	15%	8,015	65%	35%	$ 630.00	$ 140,263.20	$ 140,893.20

When incorporated into the 30-year construction loan, the monthly cost difference per member is:

- ~$2.00 between Location 1 and 3
- ~$6.50 between Location 2 and 3

Location 1

Advantages

- Intersection of two faults increase likelihood of locating water with adequate flow and recovery rates
- Low to no risk of interference with existing DHCWSC wells
- Higher likelihood of longer life
- Relatively far away from quarry operations
- Well site, 300’ easement and access roads are within the Double Horn limits
- Permission and rights in the doable category
- Significantly less construction cost over location 2

Disadvantages

- Low to moderate increase in construction cost over location 3

Location 2

Advantages

- Intersection of two faults increase likelihood of locating water with adequate flow and recovery rates
- Low to no risk of interference with existing DHCWSC wells
- Higher likelihood of longer life
- Permission and rights in the doable category
- Relatively easy access

Disadvantages

- Significantly higher construction costs over other two locations
- Closer to quarry operations
- Part of easement would most likely be outside Double Horn limits

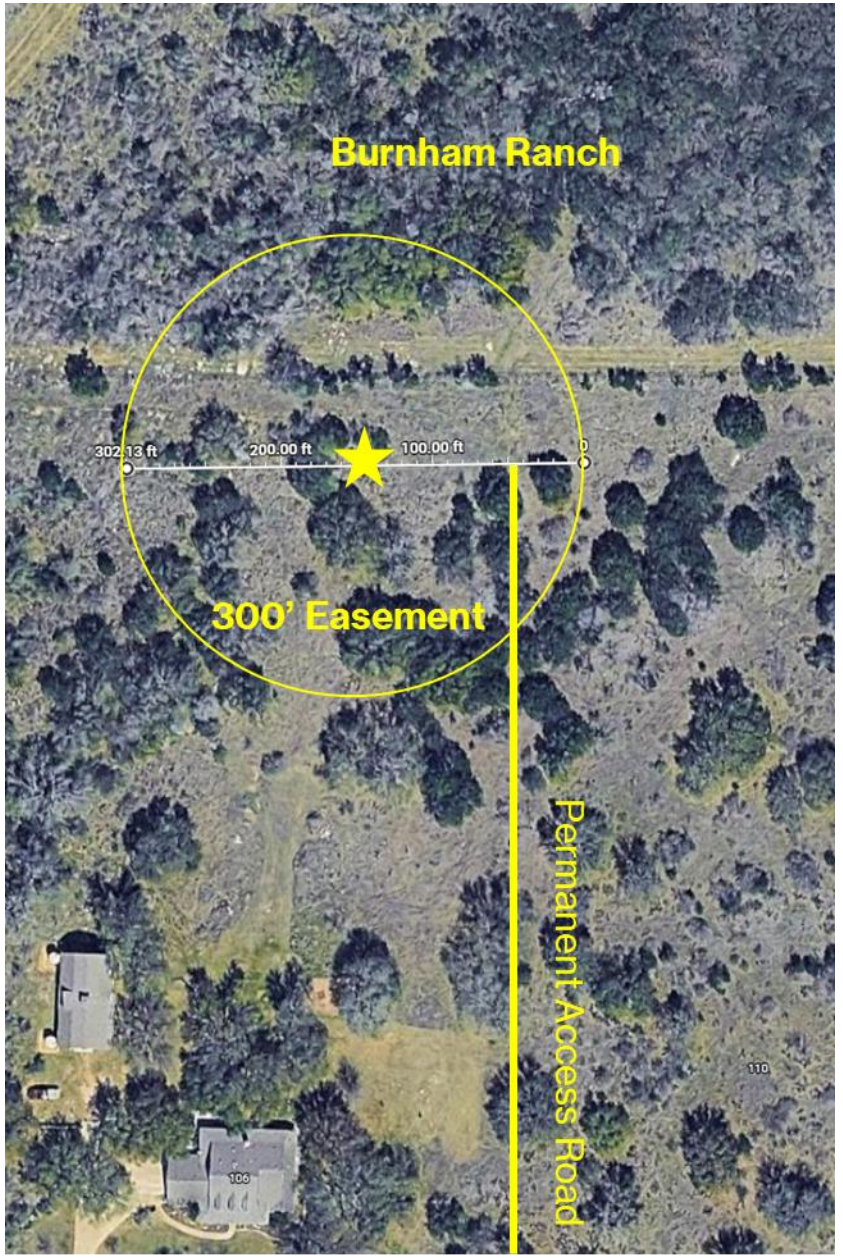
Location 3

Advantages

- Lowest construction costs
- Near single fault
- Relatively far away from quarry operations
- Permission and rights in the doable category
- Relatively easy access

Disadvantages

- Higher risk of finding sufficient flow and recovery rates over the other 2 locations
- Near to two other non-producing wells slightly increases risk
- Most likely will require easement rights from Burnham Ranch



Decision Matrix

	WT	Loc 1	Loc 2	Loc 3
Probability of Acceptable Flow & Recovery Rates	4	9	9	3
Probability of Treatable Water	4	9	9	9
Probability of Quarry Damage	4	9	3	9
Probability of Interference with Existing Well	4	9	9	9
Cost of Lease Rights	2	9	3	3
Cost of Construction	3	3	1	9
Score		**169**	**129**	**153**

The matrix assesses competing priorities rather than relative performance, enabling differentiation to support decision-making.

Location 1 offers the strongest chance of locating potable water with:

- The highest likelihood of maximum flow rate
- The greatest probability of optimal recovery rate
- The longest expected lifespan

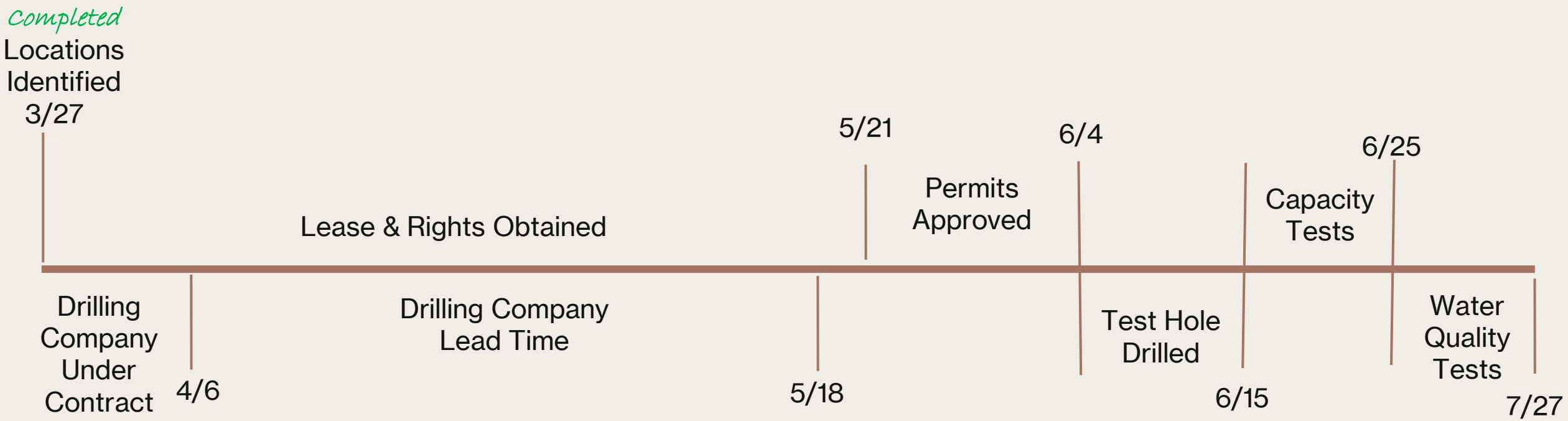
The extra construction expense amounts to $2.00 per month for members

- An affordable safeguard against the risk of a dry well or reduced lifespan

Location 3 will serve as the secondary option

The Advantages of Drilling at the Intersection of Two Faults Balanced with Overall Cost is Key In Selecting Where to Drill the Test Hole

The Next Steps



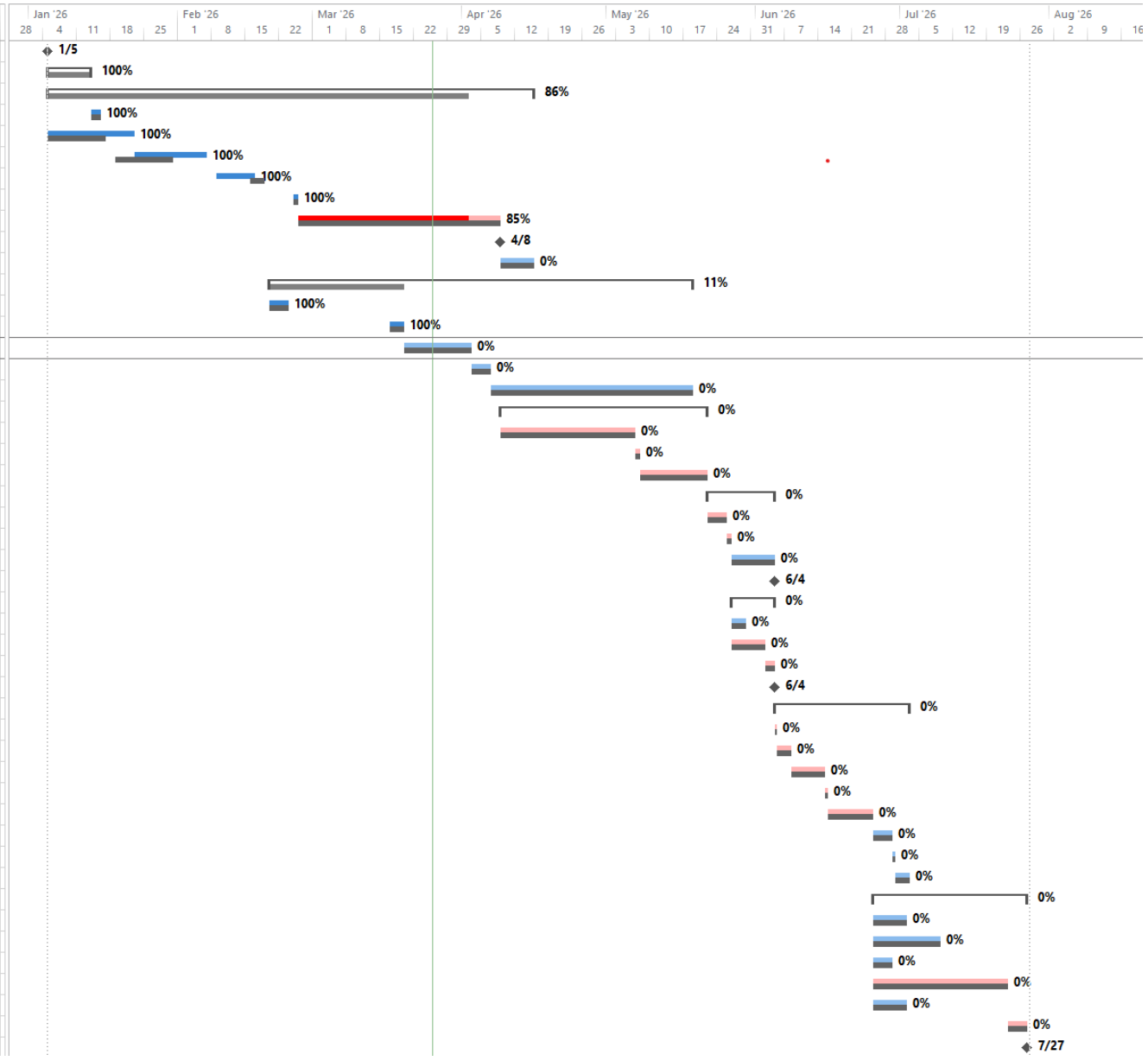
Recommendations

- Approve moving forward with drilling test hole at Location 1 as recommended in the geological study
- Prepare to enter Phase-2 at the end of July if the test hole proves successful
- Complete the “Yellow Book” audit scheduled for September that is required to obtain Phase-2 financing

Backup

The Next Steps

Task Name	Duration	Start	Finish	% Comp
Phase-1 Project Start	0 days	Mon 1/5/26	Mon 1/5/26	0%
Phase-1 Integrated Project Plan Baselined	**7 days?**	**Mon 1/5/26**	**Tue 1/13/26**	**100%**
Geologist Under Contract	**73 days**	**Mon 1/5/26**	**Wed 4/15/2(**	**86%**
Draft Geologist Contract/SOW Completed	2 days	Wed 1/14/2(	Thu 1/15/26	100%
Geologist Selected	14 days	Mon 1/5/26	Thu 1/22/26	100%
Geologist SOW Negotiated	11 days	Fri 1/23/26	Fri 2/6/26	100%
Geologists Contract Executed	6 days	Mon 2/9/26	Mon 2/16/2(	100%
Site Surveys & Soil Samples	1 day	Wed 2/25/2(	Wed 2/25/2(	100%
Data Modeling & Analysis	30 days	Thu 2/26/26	Wed 4/8/26	85%
Prioritized Sites Identified	0 days	Wed 4/8/26	Wed 4/8/26	0%
Test Site Report Received	5 days	Thu 4/9/26	Wed 4/15/2(	0%
Test Well Drilling Company On Contract	**62 days**	**Fri 2/20/26**	**Mon 5/18/2(**	**11%**
Contract & SOW Completed	2 days	Fri 2/20/26	Mon 2/23/2(	100%
Request for Quotes Submitted to Drilling Companies	3 days	Tue 3/17/26	Thu 3/19/26	100%
Quotes Received & Evalutaed	10 days	Fri 3/20/26	Thu 4/2/26	0%
Drilling Company Contract Executed	2 days	Fri 4/3/26	Mon 4/6/26	0%
Drilling Company Lead Time Completed	30 days	Tue 4/7/26	Mon 5/18/2(	0%
Property Owners Permission & LOA Received	**31 days**	**Thu 4/9/26**	**Thu 5/21/26**	**0%**
Property Owner LOA Generated	20 days	Thu 4/9/26	Wed 5/6/26	0%
LOA Submitted to Property Owner	1 day	Thu 5/7/26	Thu 5/7/26	0%
LOA Negotiated & Executed	10 days	Fri 5/8/26	Thu 5/21/26	0%
Permits Approved	**10 days**	**Fri 5/22/26**	**Thu 6/4/26**	**0%**
Permit Research & Reports Completed	2 days	Fri 5/22/26	Mon 5/25/2(	0%
Application Submitted to CTGWCD	1 day	Tue 5/26/26	Tue 5/26/26	0%
CTGWCD Application Review Period	7 days	Wed 5/27/2(	Thu 6/4/26	0%
CTGWCD Permit Approved	0 days	Thu 6/4/26	Thu 6/4/26	0%
Test Well Approved By Board	**7 days**	**Wed 5/27/2(**	**Thu 6/4/26**	**0%**
Board Meeting Scheduled & Agenda Published	3 days	Wed 5/27/2(	Fri 5/29/26	0%
Phase-1 Financial Analysis Updated	5 days	Wed 5/27/2(	Tue 6/2/26	0%
Test Well Plan Updated	2 days	Wed 6/3/26	Thu 6/4/26	0%
Board Approves Test Well	0 days	Thu 6/4/26	Thu 6/4/26	0%
Test Well Completed	**20 days**	**Fri 6/5/26**	**Thu 7/2/26**	**0%**
Test Site Prepared	0.5 days	Fri 6/5/26	Fri 6/5/26	0%
Drilling Rig Setup Completed	1 day	Fri 6/5/26	Mon 6/8/26	0%
Drilling & Casing to 200' Completed	5 days	Mon 6/8/26	Mon 6/15/2(	0%
Post Drilling Pump & Equip Installed	0.5 days	Mon 6/15/2(	Mon 6/15/2(	0%
36-Hour Drawdown & Recovery Test Completed	60 hrs	Tue 6/16/26	Thu 6/25/26	0%
Neighboring Well Interference Test Completed	2 days	Thu 6/25/26	Mon 6/29/2(	0%
Drilling Rig Teardown Completed	0.5 days	Mon 6/29/2(	Mon 6/29/2(	0%
Site Cleanup & Restoration Completed	3 days	Tue 6/30/26	Thu 7/2/26	0%
Water Quality Tests Completed	**22 days**	**Thu 6/25/26**	**Mon 7/27/2(**	**0%**
Biological Tests Completed	5 days	Thu 6/25/26	Thu 7/2/26	0%
Chemical Tests Completed	10 days	Thu 6/25/26	Thu 7/9/26	0%
Corrosion Tests Completed	2 days	Thu 6/25/26	Mon 6/29/2(	0%
Radionuclide Test Completed	20 days	Thu 6/25/26	Thu 7/23/26	0%
Free Ammonia and Field PH Test Completed	5 days	Thu 6/25/26	Thu 7/2/26	0%
Well Test Report Received	2 days	Thu 7/23/26	Mon 7/27/2(	0%
Test Well Completed	0 days	Mon 7/27/2(	Mon 7/27/2(	0%



Phase-2 Work Breakdown Structure					
WBS Element	WBS Element Title	Costs			
		Total	Labor	Material	Other
1	Phase 2 Cost	$1,829,350.13	$ 1,100,533.85	$ 96,775.08	$ 632,041.20
1.1	**Lease, Permits & Permissions**	**$ 54,928.75**	**$ 35,928.75**	**$ -**	**$ 19,000.00**
1.1.1	*Non-Recurring Property Lease Rights*	*$ 10,000.00*	*$ -*	*$ -*	*$ 10,000.00*
1.1.2	*Permits*	*$ 42,500.00*	*$ 33,500.00*	*$ -*	*$ 9,000.00*
1.1.2.1	Well Permits	$ 13,500.00	$ 10,500.00	$ -	$ 3,000.00
1.1.2.1.1	Application & Reports	$ 10,500.00	$ 10,500.00	$ -	$ -
1.1.2.1.2	Permit Fees	$ 3,000.00		$ -	$ 3,000.00
1.1.2.2	Water Line Construction Permits	$ 8,000.00	$ 7,000.00	$ -	$ 1,000.00
1.1.2.2.1	Application & Reports	$ 7,000.00	$ 7,000.00	$ -	$ -
1.1.2.2.2	Permit Fees	$ 1,000.00	$ -		$ 1,000.00
1.1.2.3	Treatment Facility Permits	$ 21,000.00	$ 16,000.00	$ -	$ 5,000.00
1.1.2.3.1	Application & Reports	$ 16,000.00	$ 16,000.00	$ -	$ -
1.1.2.3.2	Permit Fees	$ 5,000.00	$ -	$ -	$ 5,000.00
1.1.3	*Taxes*	$ 2,428.75	*$ 2,428.75*	*$ -*	*$ -*
1.2	**Public Well System Engineering**	**$ 87,087.00**	**$ 79,579.50**	**$ -**	**$ 7,507.50**
1.2.1	*Well Design & Bid Package*	*$ 16,800.00*	*$ 15,800.00*	*$ -*	*$ 1,000.00*
1.2.1.1	Well Site Survey	$ 1,000.00	$ -	$ -	$ 1,000.00
1.2.1.2	Well Design	$ 11,200.00	$ 11,200.00	$ -	$ -
1.2.1.3	Pad Design	$ 1,600.00	$ 1,600.00	$ -	$ -
1.2.1.4	Housing, Access & Security Design	$ 1,400.00	$ 1,400.00	$ -	$ -
1.2.1.5	Final Design & Bid Package	$ 1,600.00	$ 1,600.00	$ -	$ -
1.2.2	*Water Line Design & Bid package*	*$ 22,300.00*	*$ 16,800.00*	*$ -*	*$ 5,500.00*
1.2.2.1	Site Surveys	$ 4,000.00	$ -	$ -	$ 4,000.00
1.2.2.2	Underground Utility Locating	$ 1,500.00	$ -	$ -	$ 1,500.00
1.2.2.3	Underground Construction Design	$ 14,000.00	$ 14,000.00	$ -	$ -
1.2.2.4	Final Design & Bid Package	$ 2,800.00	$ 2,800.00	$ -	$ -
1.2.3	*Treatment Facility NRE*	*$ 42,100.00*	*$ 41,600.00*	*$ -*	*$ 500.00*
1.2.3.1	Underground Utility Locating	$ 500.00	$ -	$ -	$ 500.00
1.2.3.2	Pretreatment Design	$ 3,200.00	$ 3,200.00	$ -	$ -
1.2.3.3	Coagulation & Sedimentation Design	$ 1,600.00	$ 1,600.00	$ -	$ -
1.2.3.4	Radionuclide Treatment Design	$ 24,000.00	$ 24,000.00		
1.2.3.5	Filtration Design	$ 1,600.00	$ 1,600.00	$ -	$ -
1.2.3.6	Disinfection Design	$ 3,200.00	$ 3,200.00	$ -	$ -
1.2.3.7	Distribution Design	$ 1,600.00	$ 1,600.00	$ -	$ -
1.2.3.8	Monitoring & Control Design	$ 3,200.00	$ 3,200.00	$ -	$ -
1.2.3.9	Final Design & Bid Package	$ 3,200.00	$ 3,200.00	$ -	$ -
1.2.4	*Taxes*	*$ 5,887.00*	*$ 5,379.50*	*$ -*	*$ 507.50*

1.3	Public Well System Construction	$ 802,085.36	$ 208,488.21	$ 84,152.25	$ 509,444.90
1.3.1	*Well Construction*	*$ 119,568.61*	*$ 2,545.00*	*$ 23,871.11*	*$ 93,152.50*
1.3.1.1	Site Preparation	$ 1,080.00	$ 1,080.00	$ -	$ -
1.3.1.2	Site Power Construction & Installation	$ 57,325.84	$ 180.00	$ 17,993.34	$ 39,152.50
1.3.1.2.1	Trenching	$ 36,652.50	$ -	$ -	$ 36,652.50
1.3.1.2.2	Conduit & Spacers	$ 1,493.25	$ -	$ 1,493.25	$ -
1.3.1.2.3	Conduit Compliant Backfill	$ 1,407.78	$ -	$ 1,407.78	$ -
1.3.1.2.4	Meter Pedastal Pad	$ 555.31	$ 180.00	$ 375.31	$ -
1.3.1.2.5	Pull Tape & Marking Tape	$ 75.00	$ -	$ 75.00	$ -
1.3.1.2.6	Ground Rods & Clamps	$ 160.00	$ -	$ 160.00	$ -
1.3.1.2.7	Cable	$ 13,032.00	$ -	$ 13,032.00	$ -
1.3.1.2.8	Panel	$ 1,250.00		$ 1,250.00	
1.3.1.2.9	Breaker	$ 200.00		$ 200.00	
1.3.1.2.10	PEC Installation & Connect	$ 2,500.00	$ -	$ -	$ 2,500.00
1.3.1.3	Well & Pump Construction	$ 49,500.00	$ -	$ -	$ 49,500.00
1.3.1.3.1	Setup & TearDown	$ 4,000.00	$ -	$ -	$ 4,000.00
1.3.1.3.2	Conversion of Test Hole To Public Well	$ 35,000.00	$ -	$ -	$ 35,000.00
1.3.1.3.3	5 HP Pump Set at 180'	$ 10,500.00	$ -	$ -	$ 10,500.00
1.3.1.4	Pad Construction	$ 4,187.78	$ 810.00	$ 3,377.78	$ -
1.3.1.5	Housing, Access & Security Construction	$ 4,500.00			$ 4,500.00
1.3.1.6	Monitoring & Control System Installation	$ 2,225.00	$ 225.00	$ 2,000.00	
1.3.1.7	Site Cleanup and Restoration	$ 750.00	$ 250.00	$ 500.00	
1.3.2	*Underground Water line Construction*	*$ 300,856.52*	*$ 182,409.60*	*$ 48,592.52*	*$ 69,854.40*
1.3.2.1	Erosion Control	$ 1,700.00	$ 1,200.00	$ 500.00	0
1.3.2.2	Trenching Costs	$ 69,854.40	$ -	$ -	$ 69,854.40
1.3.2.3	Road Boring Costs	$ -	$ -	$ -	$ -
1.3.2.4	Underground Pipe +Delivery	$ 45,802.40	$ -	$ 45,802.40	
1.3.2.5	Misc pipe fittings, valves, etc	$ 2,290.12		$ 2,290.12	
1.3.2.6	Pipe Installation, Connection & Testing	$ 181,209.60	$ 181,209.60	$ -	$ -
1.3.3	*Treatment Facility Construction*	*$ 306,440.00*	*$ 1,440.00*	*$ 5,000.00*	*$ 300,000.00*
1.3.3.1	Pretreatment Screening & Filtration	$ 10,000.00			$ 10,000.00
1.3.3.2	Coagulation & Sedimentation	$ 25,000.00			$ 25,000.00
1.3.3.3	Filtration	$ 50,000.00			$ 50,000.00
1.3.3.4	Radionuclide Treatment	$ 130,000.00			$ 130,000.00
1.3.3.5	Disinfection	$ 60,000.00			$ 60,000.00
1.3.3.6	Distribution Mods	$ 25,000.00			$ 25,000.00
1.3.3.7	Monitoring & Control Design	$ 6,440.00	$ 1,440.00	$ 5,000.00	$ -
1.3.4	*Testing & System Qualification*	*$ 21,000.00*	*$ 8,000.00*	*$ 1,000.00*	*$ 12,000.00*
1.3.4.1	Capacity Testing	$ 5,000.00			$ 5,000.00
1.3.4.2	Water Quality Testing	$ 3,000.00			$ 3,000.00
1.3.4.3	Radionuclide Testing	$ 4,000.00			$ 4,000.00
1.3.4.4	Final System Qualification	$ 9,000.00	$ 8,000.00	$ 1,000.00	
1.3.5	*Taxes*	*$ 54,220.22*	*$ 14,093.61*	*$ 5,688.61*	*$ 34,438.00*

1.4	**Project Administration**	**$ 646,638.14**	**$ 632,989.50**	**$ -**	**$ 13,648.64**
1.4.1	*Technical Project Managmennt*	*$ 112,000.00*	*$ 112,000.00*	*$ -*	*$ -*
1.4.2	*Financial Project Management*	*$ 471,000.00*	*$ 471,000.00*	*$ -*	*$ -*
1.4.2.1	Water Finance Exchange (Bureaucratic Pilots)	$ 15,000.00	$ 15,000.00	$ -	*$ -*
1.4.2.2	Yellow Book Audits	$ 450,000.00	$ 450,000.00	$ -	*$ -*
1.4.2.3	Accounting	$ 20,400.00	$ 6,000.00	$ -	*$ 14,400.00*
1.4.3	*Legal*	*$ 15,264.00*	*$ 7,200.00*	$ -	*$ 8,064.00*
1.4.4	*Misc Other*	*$ 5,000.00*		$ -	*$ 5,000.00*
1.4.5	*Taxes*	*$ 43,374.14*	*$ 42,789.50*	*$ -*	*$ 584.64*
1.5	**Estimating Judgement**	**$ 238,610.89**	**$ 143,547.89**	**$ 12,622.84**	**$ 82,440.16**

Evaluating Loan Durations

- Three different loan durations (10-yr, 20-yr & 30-yr) analyzed
- Compared to buying bulk water over the same period
- Unless you plan on being here for more than 20-years, only the 30-year loan duration has a reasonable ROI