ROOSEVELT RIDGE CISTERN PROJECT

Sheri Keller
Charlie Nolan

“dungeon”

cistern (n.) . . . from Old French *cisterne* “cistern; dungeon, underground prison”. . .

—ONLINE ETYMOLOGY DICTIONARY

CONTENTS

PROCESS FLOW

- Explore Options
- Research
  - Define Specifications
  - Understand Installation Requirements & Best Practices
- Analysis
- Risk Evaluation
- Project Pricing

EXPLORE OPTIONS

- Above-Ground Tanks
- Types *of* Underground Tanks

ABOVE-GROUND TANKS

- These unsightly behemoths (15′ 5″ diameter × 25′ 8″ high) are incompatible with a conservation easement.
- They require 24-7 heating & stirring systems to prevent freezing.
  - Additional monthly expense for power.
  - Loss of power for an extended period in freezing temperatures could damage unit.
- Above-ground tanks are nonstarters.

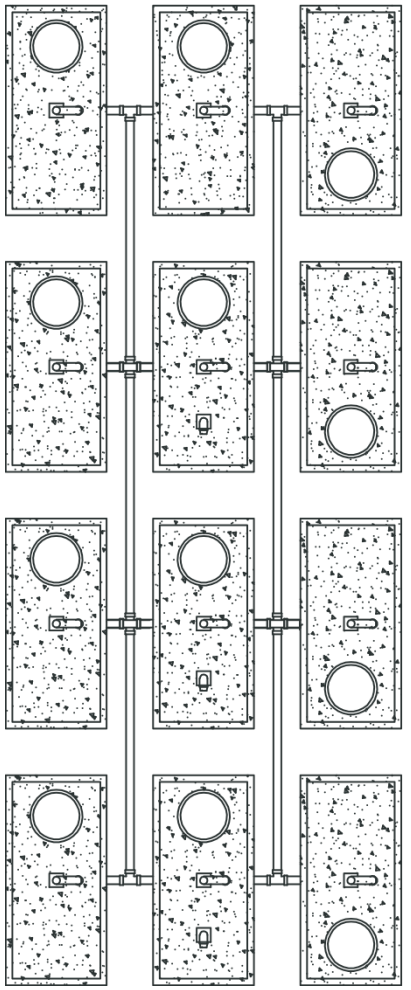
TYPES *of* UNDERGROUND TANKS

Used

Plastic

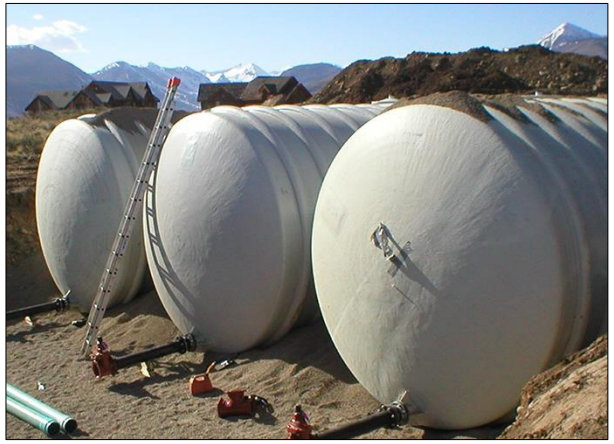
Precast Concrete

Precast Daisy Chain



Pour Concrete

Fiberglass



Steel

RESEARCH: Used Tanks

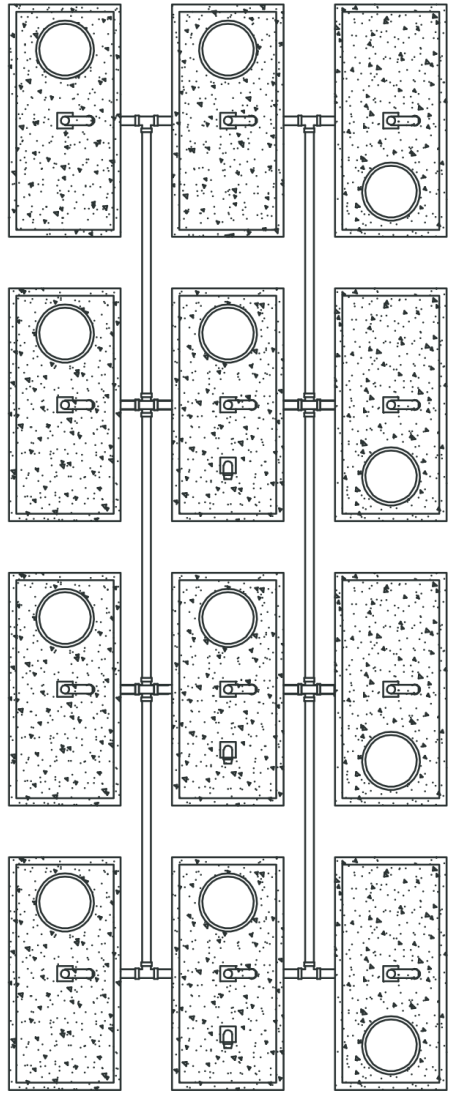
- Used tanks are mostly sold “as is, where is.”
- Buyer arranges shipping.
- Product availability is scarce.
- Added expense to clean and repair tank prior install.
- Fiberglass tank requires pea-gravel base with pea-gravel backfill.

RESEARCH: Plastic Tanks

- 30,000-gallon plastic tanks just recently entered the market — limited suppliers at this time.
- According to the manufacturer, life expectancy is 15 years on smaller tanks but unknown on 30,000 gallon.
- Do not know if the plastic can hold a 5-foot frost line.
- Gravity feed is a custom order.
- Requires sand and pea-gravel base with pea-gravel backfill.

RESEARCH: Precast-Concrete Tanks

- Right: Valley Precast has a max-bury depth of 4 feet, which does not meet Fire Chief Ondr's spec.
- Right: Every precast-concrete system requires a daisy-chain install because no one makes a 30,000-gallon tank.
  - The average tank size in Colorado is 2,900 gallons, so we need a daisy chain of 9–12 units to meet the 30,000-gallon requirement.
  - When one of these tanks cracks and leaks, how do we find the damaged unit?



- Precast installs require sand base.
- One 2,800-gallon tank weighs 18,250 lbs., which makes shipping cost prohibitive.
- No Colorado vendor would provide a quote despite promises (we received one quote from Arizona).
- The regional director for Oldcastle Infrastructure advised: "I can build you a precast system that will hold water, but I cannot guarantee it will have the water you need two years from now. . . . You're better off installing a fiberglass unit."

RESEARCH: Pour-Concrete Tanks

- Concrete pour requires an engineered tank, which must be designed pursuant to NFPA standards.
- Concrete is incredibly strong & durable, yet one crack could disable the tank.
  - All pour-concrete tanks will crack.
- Concrete is permeable — thus the need for sealant *and* a liner or bladder.
  - The concrete must be coated with Xypex sealant.
  - Then covered with a 30-millimeter pond liner, or membrane.
  - If/when the liner gets a pinhole, it will have to be replaced.
  - Some put a bladder, or pillow, in the tank to hold water. But as with the liner, one pinhole requires replacement.
- Fire Chief Paul Ondr warned against pour-concrete cisterns.

RESEARCH: Fiberglass Tanks

- Fiberglass water tanks were developed in 1965.
- In the last decade, fiberglass has emerged as *the* industry standard for fire-suppression cisterns.
- Fiberglass tanks are built to NFPA standards and can be custom designed to fit specific needs.
- The tank consists of ¼-inch fiberglass wall.
- Life expectancy of a fiberglass tank is 30 years (+).
  - Warranties do not reflect this expectation.
- Manufacturers & vendors *do not install* their units.
  - Buyer must retain their own contractors or a general.
  - Requires pea-gravel base and pea-gravel backfill.
- Fire Chief Paul Ondr warned against single-wall fiberglass tanks because the smallest ding will leak until repaired or replaced.

RESEARCH: Steel Tanks

- "Steel boasts superior structural strength over any other tank material."
- "Steel tanks typically weigh 4× greater than fiberglass tanks."
- "The significant difference between steel and fiberglass is the attributed compressive and tensile strength; steel is higher in both."
- "This gives it a better strength-weight ratio and makes it the ideal choice for fueling stations that need to support heavy equipment." (Shields, Harper & Co.)
- Blackeagle will coat the tanks with anti-corrosion material to prevent rust (see slides 43–45).
- One vendor (Blackeagle) to fabricate the unit; excavate; install tanks, pipeline, and hydrant; and backfill.

ANALYSIS

- The Controlling Factor
- Maximum Lift Illustrated
- Easement Topography
- Ideal Hydrant Location
- Approved Location
- City-Style Fire Hydrant

THE CONTROLLING FACTOR

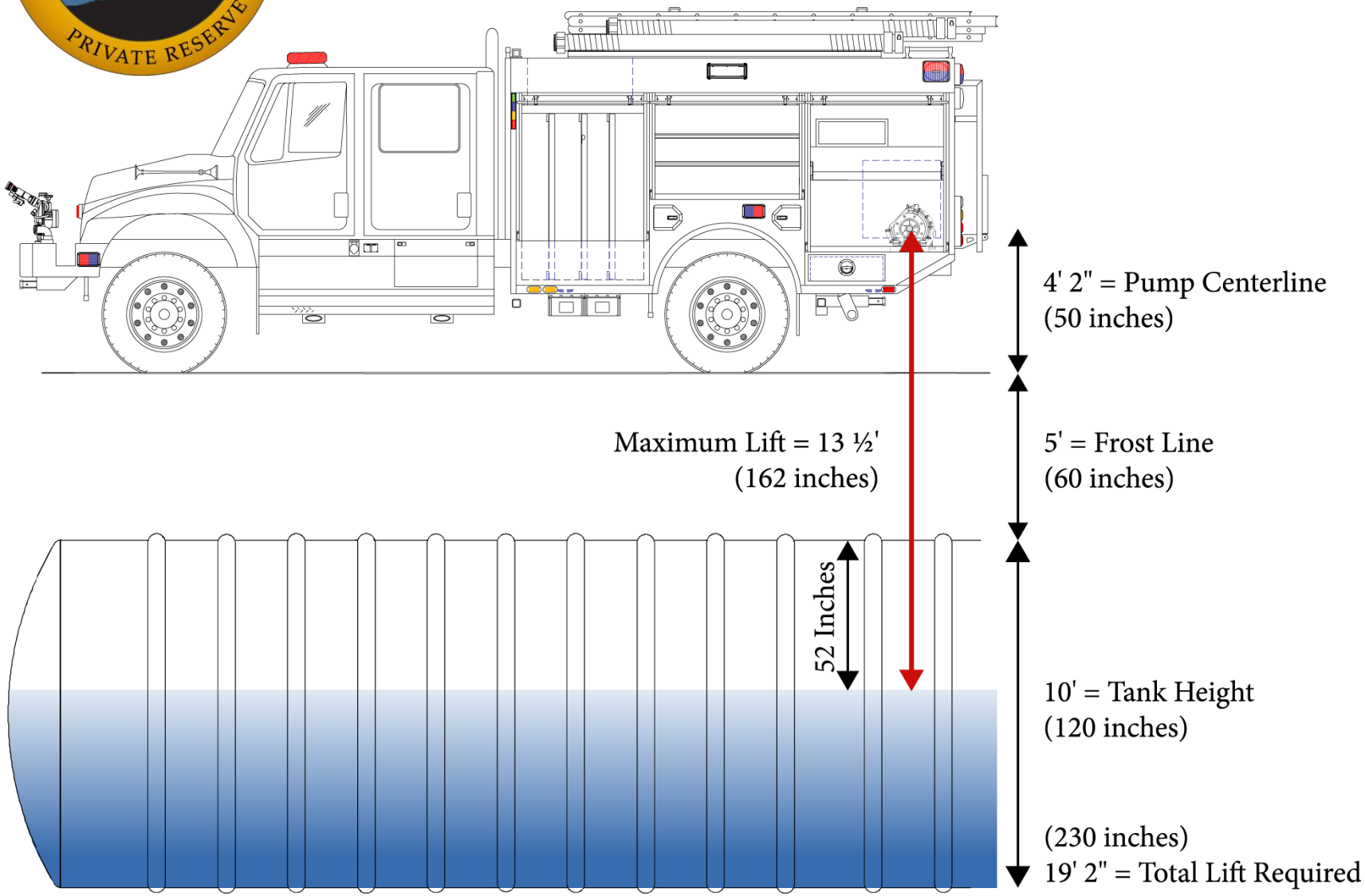
Maximum Vertical Lift Is 13 ½ Feet

- Vertical lift is the distance from the bottom of the cistern to the centerline of the firetruck pump.
- Timberline's maximum vertical lift is 13 ½ feet (see slide 33).
  - ➢ This is the controlling factor to determine whether we have a suction or gravity cistern installed.
- Doing the math with Fire Chief Paul Ondr, a firetruck can only pull water from a maximum depth of 52 inches in a suction cistern.

DECISION

- Fire Chief Ondr agrees with our conclusion: We must install a gravity-discharged cistern.
- To accommodate Timberline's variety of firetrucks, a city-style fire hydrant is required at the bottom of the diagonal.

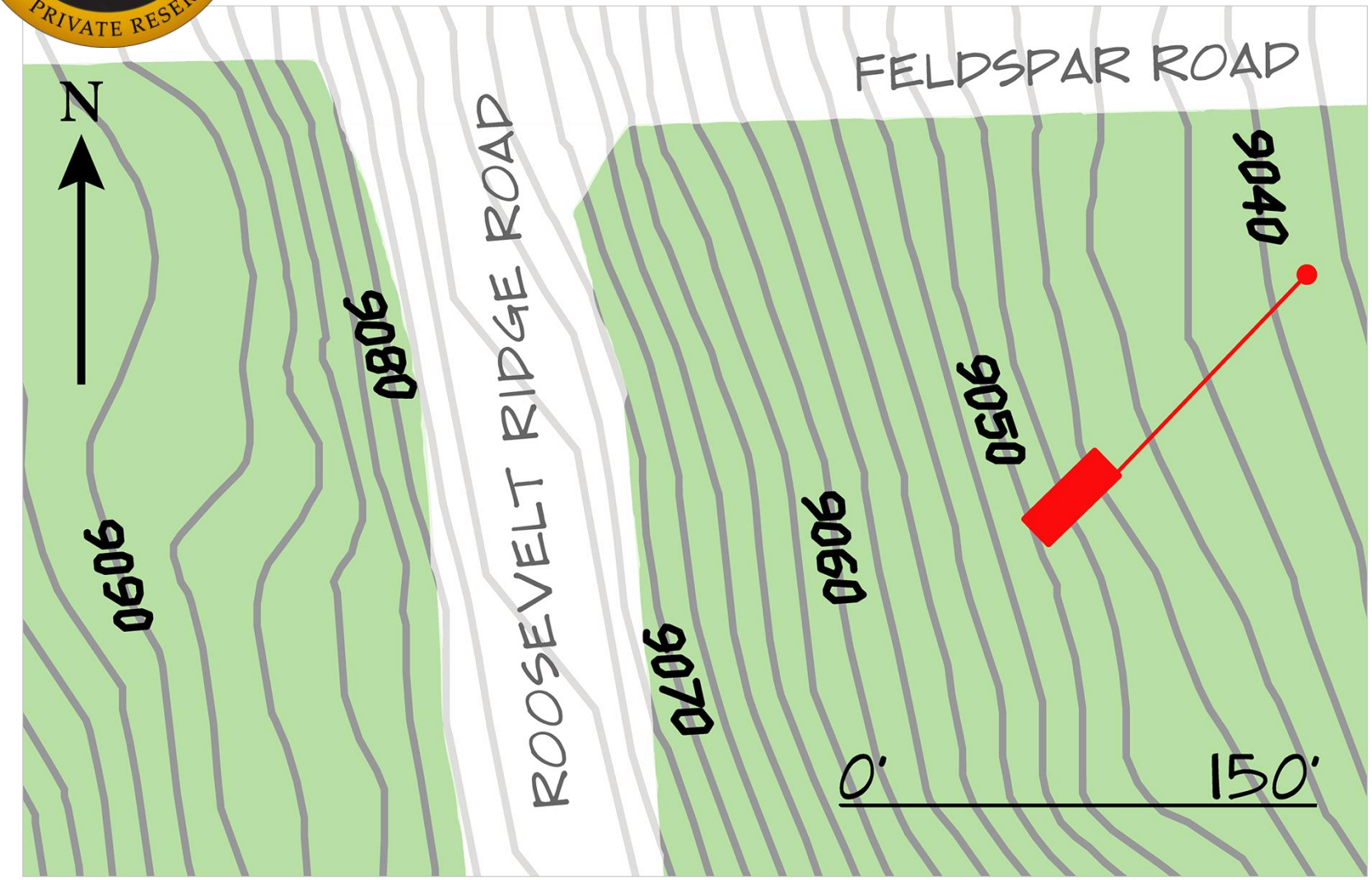
MAXIMUM LIFT ILLUSTRATED



MAX LIFT CALCULATED

- Timberline's max lift is 13½ feet (red arrow).
- If the bottom of the tank sets lower than 13½ feet, then we must install a gravity-discharged cistern.
  - 50 inches from the pump centerline to the ground.
  - 60-inch frost line per Fire Chief Ondr's request.
  - 120-inch *minimum* height of a water tank.
- These three (pump centerline + frost line + cistern height) = 230 inches.
- Timberline could only tap 52 inches from a suction tank.
- Therefore, we must install a gravity-discharged cistern.

EASEMENT TOPOGRAPHY

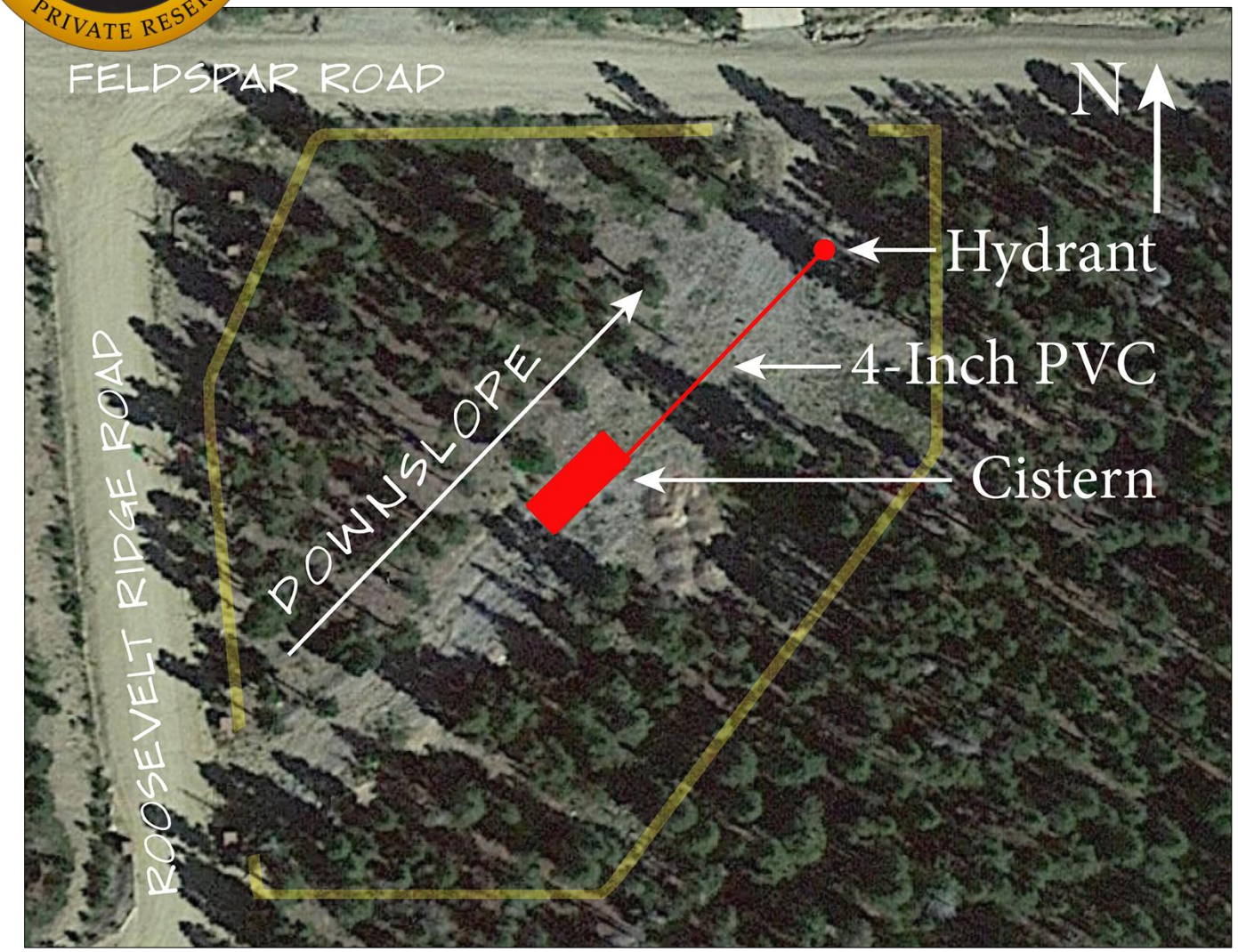


- Topo map is accurate and to scale.
- Cistern, PVC, and hydrant are illustrative only.
- Fire Chief Paul Ondr, Assistant Chief Chris Schimanskey, and Deputy Chief Chris Bondus have inspected and approved the Lot 15 easement for our cistern.
- The 30-foot rise allows tremendous install flexibility.
- E.g., Fire Chief Ondr advised a 5-foot depth for the tank because it will be on the north face. The slope easily accommodates this.

IDEAL HYDRANT LOCATION

On June 11, 2020, firefighters from the Timberline Fire Protection District visited Roosevelt Ridge to confirm that the diagonal provides sufficient turn-around space and to pick a spot for the hydrant. They memorialized their visit with these pics: "Attached are 3 pictures from our trip." —Fire Chief Paul Ondr

APPROVED LOCATION



Easement on Lot 15

- Lot 15 has an easement for the fire district.
- The natural slope of this land is ideal for a gravity-discharged cistern.
- Fire Chief Ondr, Assistant Chief Schimanskey, and Deputy Chief Bondus inspected and approved this location.
- The original developer cleared trees and cut a road pursuant to Gilpin County Resolution No. SBE 05-01, which will save costs.
- The water tank will be buried in the middle of the slope.
- Four-inch PVC connects the tank to the hydrant.
- Fire Chief Ondr requires a city-style hydrant to facilitate all of Timberline's firetruck models.

CITY-STYLE FIRE HYDRANT

- No quote includes a fire hydrant (Blackeagle included hydrant installation, but not the hydrant).
- Fire Chief Paul confirmed that we must obtain a City of Blackhawk spec hydrant — the Super Centurion 250 (left).
- The City of Blackhawk requires a 7-foot bury (frost line) on fire hydrants.
  - A Super Centurion 250 with a 7-foot bury is a special order that takes 12–16 weeks to manufacture, but we found one in state.
  - We were quoted $3,881 (includes 12-inch snow extension per Fire Chief Ondr's request).
  - Blackeagle also quoted $3,881 for the same units.
  - This requires a quick decision to move forward.

RISK EVALUATION

- Tank Types Evaluated
- Risk Categories
- Risk Ranking: Lowest to Highest

TANK TYPES EVALUATED

- Steel
- Double-Wall Fiberglass
- Pour Concrete*
- Precast Concrete

RISK CATEGORIES

A = Nat. Fire Protection Assoc. Compliant

0 = Yes
1 = No

B = Tank Life Expectancy Without Repair

1 = 20 years (+)
2 = 10–20 years
3 = 5–10 years
4 = No Guarantee

C = Caution from Fire Chief Ondr

0 = No comment
1 = Red flag

D = Number of Contractors Needed

1 per contractor

E = Additional Materials Required for Install

0 = No additional materials required
1 per additional material required

F = Complexity of Install

0 = One pipeline for gravity feed
1 = Additional tree clearing
2 = “Y” connection required
3 = Two or more pipelines
4 = Daisy-chain piping (per 4 units)

RISK RANKING: Lowest to Highest

TANK	SUBTOTALS	TOTAL
Steel	A=0 B=1 C=0 D=1 E=0 F=2	4
Double-Wall Fiberglass	A=0 B=1 C=0 D=2 E=1 F=0	4
Pour Concrete*	A=1 B=4 C=1 D=4 E=6 F=2	18
Precast Concrete	A=1 B=4 C=1 D=2 E=3 F=9	20

LEGEND

A = NFPA Compliant
B = Tank Life Expectancy
C = Caution from Fire Chief Ondr
D = Number of Contractors
E = Material Complexity of Install
F = Complexity of Install

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* Received information from previous BOD research: Not able to receive formal bids for this option at this time. Major issue is receiving a design to allow all other vendors to quote per the design. Bart offered to do a design but requires a payment of 7% of the project cost (estimating $3,500–$5,000) payment prior beginning his work. Design engineer's concerns: Designing a lid/top with structural integrity. Concrete is great for channeling water, but not holding it long term.

PROJECT PRICING

- Vendors Quoted
- Project Duration
- Project Pricing
- Warranties

VENDORS QUOTED

Steel

Vendors:

- Blackeagle Fabrication
- Highland Tank & Manufacturing Company, Inc.

Installation and Materials:

- Blackeagle Energy Services

Double-Wall Fiberglass

Vendors:

- Nationwide Tank & Pipe
- ZCL Composites

Installation & Materials:

- Blackeagle Energy Services

Single-Wall Fiberglass*

Vendors:

- CGRS, Inc.
- Darco Inc.
- Fiberglass Tank Solutions
- National Storage Tank
- Nationwide Tank & Pipe
- Westech Equipment
- ZCL Composites

Installation & Materials:

- Blackeagle Energy Services

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* We obtained these quotes *before* Fire Chief Ondr advised double-wall fiberglass.

Precast Concrete

Vendors:

- Jensen Precast

Excavation:

- (waiting for specs)

Installation:

- (waiting for specs)
- Large crane required

Materials:

- Crushed stone
- Bank-run gravel used for backfill.
- Hand-operated equipment only for backfill.

VENDORS QUOTED continued

Cranes

- American Pride Crane
  - $300 per hour, base rate 3–4 hours
- Mountainside Crane Service
  - $165 per hour + 1½ hour drive time
- Pro Lift Crane Service
  - $225 per hour + drive time
- RMS Cranes
  - $225 per hour + 3-hour drive time

Fire Hydrant & 1′ Extension

- Ferguson Waterworks
  - $3,881
- Blackeagle Energy Services
  - $3,881

Pea Gravel

- Albert Frei & Sons
  - $33 per ton + shipping from Henderson @ $120 per hour per round trip
- Front Range Material Inc.
  - $31.50 per ton delivered (tax not included): We need 330 tons — or 22 truckloads @ 15 tons per load.
- Pioneer Landscape Centers
  - $41 per ton + one-time $95 delivery fee
- Titan Landscape Materials
  - $45 per ton

Water @ 30,000 Gallons Delivered

- A1 Discount Water
  - $3,420
- Bulk Water Runner
  - $3,375
- McDonald Farms Enterprises, Inc.
  - $3,570
- Mile Hi Water
  - $3,225

PROJECT DURATION*

Steel

Fabrication:	2–3 weeks
Delivery:	1 day
Installation:	3 days
Total:	25 days

Precast Concrete

Fabrication:	5–6 weeks**

Delivery: Buyer must find carrier from Arizona.

Excavation:	2 weeks
Installation:	2 weeks
Total:	TBD

** Timeline is a SWAG.

Single-Wall Fiberglass

Fabrication:	5–6 weeks
Delivery:	3 days
Installation:	4 days
Total:	7 weeks +

Double-Wall Fiberglass

Fabrication:	6 weeks
Delivery:	3 days
Installation:	4 days
Total:	7 weeks +

* All installs need an additional 1–2 days to fill tanks with water.

Pour Concrete†

Engineer:	2 weeks
Excavation:	1 week
Forms & Concrete:	4–5 weeks
Seal Interior:	1 week
Interior Bladder:	2–4 weeks
Piping:	1 week

Projected Completion:
"late 2021 or early 2022"

† This is *the only* estimate obtained by the Board of Directors. Timeline is a SWAG. Projected completion is not.

PROJECT PRICING*

Steel

Tank: Blackeagle Fabrication
Excavate | Install: Blackeagle†

Two 15,000-Gallon USTs	$47,818
Shipping	$0
Tax	$0
Excavation | Install | Backfill	$18,796
Mob | Demob | Cleanup	$5,346
4-inch FBE Coated-Pipe Install	$13,000
Total	**$84,960**

Blackeagle will accept down payment of $70k and require a bond for the balance (+ 6.5% interest).

Single-Wall Fiberglass

Tank: Darco Inc.
Excavate | Install: Blackeagle†

One Gravity-Feed UST	$49,670
Shipping	$0
Tax	$0
Excavation | Install | Backfill	$20,896
Mob | Demob | Cleanup	$5,346
4-inch FBE Coated-Pipe Install	$13,000
Total	**$88,912**

No financing available.

Double-Wall Fiberglass

Tank: Nationwide Tank & Pipe
Excavate | Install: Blackeagle†

One Gravity-Feed UST	$49,255
Shipping	$7,500
Tax	$4,683
Excavation | Install | Backfill	$20,896
Mob | Demob | Cleanup	$5,346
4-inch FBE Coated-Pipe Install	$13,000
Total	**$100,680**

No financing available.

* Total prices do not include:
  - Hydrant: $3,900
  - Water: $3,500

† Maximum estimate of $15,000 if blasting is required.

WARRANTIES

Warranties vary from vendor to vendor. The warranties below are for the top-three quotes (steel tank, single-wall fiberglass, and double-wall fiberglass). Nationwide Tank & Pipe offers the best warranty of any provider in any category.

Blackeagle Energy Services	"standard 1-year warranty on any workmanship defects to the fabrication and installation of the tank and pipeline" (see slide 42)
Darco Inc.	2-Year Limited Warranty (tank only)
Nationwide Tank & Pipe	20-Year Limited Warranty (tank only)

QUESTIONS

If you think of something later, please reach out to us. We will give you the answer or go find it if we do not know. We want every Member to rest assured that this assessment has been allocated responsibly.

Contact Information

| (303) 426-9806

| (303) 816-2040

Archive *for* Fire Chief Paul Ondr

“I would love to . . . see if we can create a solid plan.”

From: Paul Ondr
Sent: Wednesday, May 20, 2020 1:28 PM
To: Sheri Keller
Cc: Jennifer Hinderman
Subject: Re: Roosevelt Ridge Fire Cistern

Sheri, I am sorry for the delay.

The maximum attainable lift at sea level is 22.5 feet. The unfortunate challenge we face is we lose 1 foot of lift for every 1000 feet of elevation which leaves us with at 13.5 feet. This is the maximum distance from the water inlet level on the suction pipe at the bottom of the tank to the center the pump on our truck when parked at the connection site.

These numbers certainly create some challenges when you need to cover the tank deep enough not to freeze. If it is possible to put the tank on a hill or high side of the road this can provide some significant advantages. I would love to come out and take a look at the area and see if we can create a solid plan.

Thanks
Paul Ondr, Fire Chief
Timberline Fire Protection District
720-352-3885

“Perfect. I will meet you there.”

From: Paul Ondr
Sent: Monday, June 1, 2020 3:21 PM
To: Sheri Keller
Cc: Jennifer Hinderman; Charles Nolan
Subject: Re: Roosevelt Ridge Fire Cistern

Perfect. I will meet you there.

Paul Ondr, Fire Chief
Timberline Fire Protection District
720-352-38852

“the best approximate placement for the hydrant”

From: Paul Ondr
Sent: Thursday, June 11, 2020 3:19 PM
To: Charles Nolan
Cc: Jennifer Hinderman; Sheri Keller
Subject: Re: Reminder

Thank you for the reminder. Attached are 3 pictures from our trip. We placed 3 pieces of wood with some flagging in the middle for the best approximate placement for the hydrant.

The Hydrants should have one 4.5 inch Nation Hose connection and two 2 ½ inch National Hose connections.

Your info on our trucks was correct, the eye of the pump is approximately 50 inches off the ground.

Paul Ondr, Fire Chief
Timberline Fire Protection District
720-352-3885

“The one in the photo. . .”

From: Paul Ondr
Sent: Tuesday, June 30, 2020 8:20 AM
To: Charles Nolan
Cc: Jennifer Hinderman; Sheri Keller
Subject: Re: Other specs

Charlie, Sorry for the delay for some reason your emails go to my junk mail. So we don’t really have an identified hydrant “spec” as we have very few and they are owned and operated by Gilpin County. I have attached some pictures of the ones the county uses and this is what we are used to operating. The one in the photo is very tall which is great for snow but 18 inches shorter or so would be better as long as it is plowed. Let me know if this helps.

Thanks

Paul Ondr, Fire Chief
Timberline Fire Protection District
720-352-3885

“I have attached some pictures. . .”

Fire Chief Paul Ondr sent these pics as examples of Gilpin County’s spec fire hydrant. In the follow-up phone call he advised us to install a City of Black Hawk spec hydrant.

“That will be great.”

From: Paul Ondr
Sent: Thursday, July 02, 2020 6:52 PM
To: Charles Nolan
Subject: Re: Hi Carter!!

Looks to me like the A-423 will be 5 ¼ with 1 large outlet and 2 small. This looks to match the pictures I sent. Let’s do 12 inch extension with a flag. That will be great.

Paul Ondr, Fire Chief
Timberline Fire Protection District
720-352-3885

TFPD Meeting Notes

- On June 3, 2020, at 10:30 AM, we met on the Lot 15 easement with three representatives from the Timberline Fire Protection District — Fire Chief Paul Ondr, Assistant Chief Chris Schimanskey, and Deputy Chief Chris Bondus.
- Two reps from Blackeagle Energy Services also attended.
- All three fire chiefs approved the easement on Lot 15 for the cistern.
- Fire Chief Ondr reiterated that his maximum lift is 13½ feet.
- He confirmed that the pump centerline is the same on all of his trucks.
- We briefly discussed above-ground water tanks. Problems associated with power to the unit ended the subject.
- We briefly discussed the possibility of a mound install (cistern partially raised above ground) to gain lift.
- Fire Chief Ondr eliminated suction cisterns from the conversation (insufficient lift), and he determined that we must install a gravity-discharged cistern.
- He requires a city-style fire hydrant to accommodate all firetrucks.
- He ruled out Feldspar Road as a location for the hydrant.
- He committed to emailing the specs he needs for fittings on the hydrant as well as the distance from ground level to the pump eye.
- Chief Ondr preferred Lot 16 for the cistern because it would allow a hydrant on Roosevelt Ridge Road and it would provide more turn-around space for trucks.
- He advised a *minimum* frost line of 48 inches, but he specifically requested a 60-inch frost line.
- He asked for a 6-foot depth on the PVC line.

TFPD Meeting Notes continued

- He advised that we must keep access to the hydrant free of snow during winter.
- We discussed the possible need to improve the entrance to the hydrant with road base or RAP (reclaimed asphalt pavement).
- He said he would send a truck by the proposed location of the hydrant to confirm it has enough turn-around space and to pick the prime spot for the hydrant.
- He described the long-term maintenance problems associated with leaking cisterns — both concrete and fiberglass.
- Fire Chief Ondr cautioned against concrete tanks, because one pinhole in the membrane or bladder destroys it forever — it must be replaced.
- He warned against single-wall fiberglass tanks. If we choose fiberglass, it should be double wall to prevent leaks.
- He said that Timberline Fire Protection District has never negotiated anything with the Roosevelt Ridge BOD. He repeated: "Never."
- Fire Chief Ondr asked why Sheri took over the project.
- Sheri's hardline on cost impressed Chief Ondr: "We could use her at the district!"
- He appeared *very* encouraged to see Blackeagle on location.
- He noted that Blackeagle is currently doing a high-profile job on HWY 119.
- He noted that real estate agent Celeste Hale had inquired about the ban on building permits.
- He mentioned that his crew may have left the front gate open in the past.
- The meeting ended at 12:15 PM.

BLACKEAGLE ARCHIVE

Blackeagle Email 1

From: Ryan Miller
Sent: Wednesday, June 24, 2020 4:22 PM
To: Sheri Keller
Cc: Charles Nolan; Bryan Niesent
Subject: RE: VOX NS Cistern Fabrication and Installation

Good afternoon Sheri,
Just to confirm what we discussed on the phone:

- We will take a partial payment upon completion of the work and collect the remainder in Jan/Feb. We ask that [Roosevelt Ridge] put a bond in our name for the amount you wish to finance through Blackeagle. I do not believe I mentioned this on the phone, but Blackeagle will require 6.5% interest to be paid on any amount [Roosevelt Ridge] wished to delay.

- As we discussed, we believe it could be up to $15,000 of additional costs if rock is found and we need to bring in extra machinery or blast to break up the rock.

- Blackeagle will honor our standard 1 year warranty on any workmanship defects to the fabrication and installation of the tank and pipeline. However, we truly stand behind our product and we are and are going to continue to be a long standing company in this region, so we will definitely work with you on any defects due to our fabrication or installation. We will always do what is right with our clients.

Blackeagle Email 1 continued

- We also discussed that we will have the internal and external coating on the tanks. This will protect the steel from oxidizing (corroding/rusting) due to contact with water and wet soils. However, we are also planning to place a sacrificial anode on each tank just in case there is a scratch in the coating and to protect any areas where there may be bare metal in contact with water or wet soils (manway, water fill port, atmospheric vents, etc.).

- Sacrificial Anodes are highly active metals that are used to prevent a less active material surface from corroding. Sacrificial Anodes are created from a metal alloy with a more negative electrochemical potential than the other metal it will be used to protect. The sacrificial anode will be consumed in place of the metal it is protecting. When metal surfaces come into contact with electrolytes (water, wet soil, etc.), they undergo an electrochemical reaction known as corrosion. Corrosion is the process of returning a metal to its natural state as an ore and in this process, causing the metal to disintegrate and its structure to grow weak. These metal surfaces are used all around us — from pipelines to buildings to ships. It is important to ensure that these metals last as long as they can and thus necessitates what is known as cathode protection. Sacrificial anodes are among several forms of cathode protection.

Thank you again for this opportunity. Please let me know if you have any additional questions.

Ryan Miller
Facilities Manager

Blackeagle Email 2

From: Bryan Niesent
Sent: Thursday, July 9, 2020 8:26 AM
To: Sheri Keller
Cc: Ryan Miller
Subject: RE: RR Cistern

Sheri,

Please see the below email from Sherwin Williams about the tank internal corrosion and clogging the hydrant. Thanks again. . . .

> Bryan, provided there is no turbulent activity and heavy particulate matter within the tanks there will be no issue with wear. Of course proper surface prep will be important in providing long service life.
>
> These holding tanks are similar to potable water immersion scenarios. For these tanks the system we recommended mirrors the AWWA ICS #1 which calls for surface prep of SSPC SP10 then 2 coats of Macropoxy 646 Epoxy at 4–6 mils DFT per coat. If preferred you could add a prime coat of Corothane I Galvapac 1K Zinc Primer applied at 2–3 mils DFT prior to applying the 2 coats of Macropoxy 646 Epoxy which would mirror AWWA ICS #5.
>
> These systems are designed to provide long-term service life and protection to the tanks from corrosion. In holding tanks like these that is usually in excess of 10 years when surface prep is properly performed and products are applied per data sheet instructions and recommendations.
>
> Please let me know if I can answer any other questions for you and your customer. . . .
> The Sherwin-Williams Company

Bryan Niesent

BLACKEAGLE Fabrication

Blackeagle Email 3

From: Bryan Niesent
Sent: Friday, July 10, 2020 2:00 PM
To: Sheri Keller
Cc: Ryan Miller; Kevin Jackson
Subject: RE: RR Cistern

Sheri,

As for the internal coating. It is used for internal lining of hundreds of tanks we do for the oil and gas industry. We have used this coating for the last 10 years and have not had any vessels/tanks have problems. Please see the data sheet attached for the coating we are going to use. The coating will be applied the same way as we do for the very strict and critical oil and gas applications. We have been using this coating for the last 10 years and we have seen vessels with this coating from other fab shops lasting 20+ years and still have no problems. Please let me know what you think. Thanks

Bryan Niesent

Blackeagle References*

April Kelly Summit Midstream (Phone & Email Redacted)	Amanda Palmer DCP Midstream (Phone & Email Redacted)	Jared Michaels DCP Midstream (Phone & Email Redacted)

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* Albert Frei & Sons (AFS, the aggregate pit on HWY 6 in Idaho Springs) originally referred us to Blackeagle. We called for a quote on pea gravel and then asked for names of recommended excavators. AFS mentioned Blackeagle first, noting that they specialize in underground infrastructure. Ten minutes later Blackeagle said they could do the entire job: "My warehouse will be empty for the next three months — let me fabricate a tank for you *and* install it!"

APPENDIX

APPENDIX A: Paradise Valley Estates Email 1

From: PVE Secretary
Sent: Saturday, July 11, 2020 1:24 PM
To: Carolus; At Large; Vice President; President; Treasurer
Subject: Cistern question from Roosevelt Ridge Neighbors

Hi Charlie. . . .

Regarding our cisterns — we have five in PVE, one big one (holds 35K gallons) and four smaller ones throughout the neighborhood (not sure of their size). We have not had any issues that I know of other than the four smaller ones do freeze in the winter, not sure about the big one but can say it was not frozen in early April per Timberline Fire Department while the others were. I do not know if they are steel, fiberglass, etc. I have added the other board members because I am sure they have more information about the cistern specs than I do. Jeff Scott, our At Large board member, has been working with Timberline lately to make sure these are still functioning properly if an emergency arises. He may be able to tell you what they are made of and give you more pertinent information you may need for your cistern development. Timberline Fire Department should have this information also. Let me know if you have any other questions. I am always happy to help our Gilpin neighbors!

Janey Wood, PVE Secretary

APPENDIX B: Paradise Valley Estates Email 2

From: AtLarge
Sent: Monday, July 13, 2020 1:10 PM
To: Carolus
Cc: President; VicePresident; PVE Secretary; Treasurer
Subject: fire suppression cisterns

Good Afternoon Charlie:

I do not have much information about the cisterns in Paradise Valley but I'm assuming they are metal tanks. I have been in touch with Aaron Jones of Timberline Fire District (AJones@timberlinefire.com) regarding. He may be able to offer some useful information. Coincidentally, I did install a cistern for a residential application back in 2011. It was a 10,000 gallon metal tank. From what I can recall, the price difference, when completed, was similar for metal vs. plastic. Metal was more difficult to transport but easier to backfill while plastic was the opposite. I was able to purchase the metal tank used but had also priced a plastic unit from Timberline Plastics. I believe they have changed their name to Fernco but I'm not sure what they now offer. No real maintenance from what I recall but they do need to be placed completely below frost line for obvious reasons.

Sincerely,

Jeff Scott, At Large
Paradise Valley HOA

APPENDIX C: Paradise Valley Estates Email 3

From: Aaron Jones
Sent: Wednesday, July 15, 2020 12:33 PM
To: carolus@planetchunk.com
Subject: Re: I am with Roosevelt Ridge HOA

Hello Charlie how are you? I do not know what the cistern tanks in your area are made from. I can take a guess at the one located at Paradise Valley / Dill Pickle PL. This cistern is approx 30k–35k gallons. I would adventure a guess it's a steel tank, maybe a tanker car type. This would be our main water source if needed for your area. They other 4 do freeze in the winter and have some issues. I'll forward you an email I sent to Jeff to bring you up to speed on the others. I'm assuming you know the locations of all 5 cisterns in Paradise Valley? If not I can give you the info.

If you need anything else please let me know. Take care.

Aaron Jones
Timberline Fire
720-270-9612

APPENDIX C: Paradise Valley Estates Email 4

Hello Jeff how are you? I apologize but I just found your email buried in many other emails I've also been away from the district for two months and I'm just getting back.

Before I left I did check all the cisterns in Paradise Valley. As of right now the main one Timberline will utilize is the first at Paradise Valley / Dill Pickle PL. It's large capacity (approx 30k–35k gallons), easy hook-up, doesn't freeze in winter and (as long as there is no snow piled) easy to access.

I did find issues with the other 4. All four of the other cisterns freeze in the winter. In addition two have hydrocarbons mixed with the water. Not sure if this was on purpose or if it's residual from a reused fuel tank buried and used as a cistern. Have you heard anything about this? We try not to run water mixed with hydrocarbons through our engines/pumps.

The cistern at "Lot 31" (approx 700 address of Paradise Valley) has some type of hydrocarbon in it. I'm guessing diesel or gas. In addition the cistern at Paradise Valley and Cucumber has diesel or gas mixed with the water.

As mentioned above, the first cistern at Paradise Valley and Dill Pickle PL will be our go to water source if needed. With that being said, has the HOA came up with a plan for the snow in the winter? I don't think it would be difficult to address the snow issue with a few signs placed at that location indicating no snow placement, etc.

That's about all I have for now. Hope you're doing well. If you need anything I'm back at work. Email or call. Take care.

Aaron Jones
Timberline Fire
720-270-9612

APPENDIX C: Contractors & Vendors Contacted

Backfill
- Elk Creek Sand & Gravel
- Albert Frei & Sons
- Front Range Material Inc.
- Pioneer Landscape Centers
- Titan Landscape Material

Concrete Tanks
- Lakota Tank Company

Cranes
- American Pride Crane Service, Inc.
- Commercial Cranes Longmont
- Mountainside Crane Service
- Pro Lift Crane Service
- RMS Cranes

Engineers
- Ikeler Engineering & Construction

Excavators
- Burbach's Rocky Mountain Excavating
- CWS Excavating
- Dig Excavation Inc.
- H&S Excavating
- Kutscher's Excavating LLC
- Dan Martin Excavating
- Sayler & Sons Excavating, Inc.

Fiberglass Tanks
- Assmann Corporation of America
- CGRS, Inc.
- Containment Solutions
- Darco Inc.
- Design Tanks
- Diamond Fiberglass
- Fiberglass Tank & Pipe Institute
- Fiberglass Tank Solutions
- GEI Works
- Kubat Equipment & Service Co.
- National Storage Tank
- Nationwide Tank & Pipe
- Pacific Tank Engineering
- Tank Depot
- Westech Equipment
- ZCL Composites

Fire Hydrants
- Ferguson Waterworks
- Grand Junction Pipe & Supply
- Mueller Water Products, Inc.
- Winsupply Inc.

General Contractors
- Blackeagle Energy Services
- C4 Ltd.
- CGRS, Inc.
- Coal Creek Excavating
- ESCO Construction Company
- Florian Freymuth
- Kennedy Custom Design

Precast-Concrete Tanks
- Boughtons Precast Inc.
- Colorado Precast Concrete
- EnCon United Company
- Front Range Precast Concrete
- Jensen Precast
- Lindsay Precast
- Oldcastle Infrastructure, Inc.
- Phoenix Precast Products
- Valley Precast, Inc.
- Vaughn Concrete Products, Inc.
- Wells Concrete

Pumper Tankers
- Rosenbaurer

Ready Mix Concrete
- Arvada Ready Mix
- Loveland Ready Mix Concrete, Inc.
- Peak Ready Mix
- Velocity Ready Mix, LLC.

Steel Tanks
- Blackeagle Fabrication
- Highland Tank & Manufacturing Company, Inc.
- Longero
- TrueNorth Steel
- Western Steel & Boiler

Water Suppliers
- A1 Discount Water
- Bulk Water Runner
- Foothills Water Delivery Service
- Front Range Water
- McDonald Farms Enterprises, Inc.
- Mile Hi Water
- Mountain Man Water
- Mountain View Water Service
- Water Boy

APPENDIX E: Gilpin County Resolve

"Applicant [Lone Pine Real Estate, LLC] shall be required to petition for annexation into a fire district and the applicant must complete any code improvements required by the district."

—BOARD *of* COUNTY COMMISSIONERS

"Costs, Liability and Taxes. Grantor [Lone Pine Real Estate, LLC] agrees to bear all costs of operation, upkeep, and maintenance of the Property."

—DEED *of* CONSERVATION EASEMENT

"Any violation of any federal, state, municipal or local law, ordinance, rule or regulation, pertaining to the ownership, occupation or use of any property within the Project Area is hereby declared to be a violation of this Declaration and shall be subject to any and all of the enforcement procedures set forth in this Declaration."

—DECLARATION § 16.11

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