TETRA TECH

WVDEP PELL ROAD DOSER UPGRADE PROJECT

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15th International Mine Water Association Congress

PELL ROAD Doser Upgrade Project

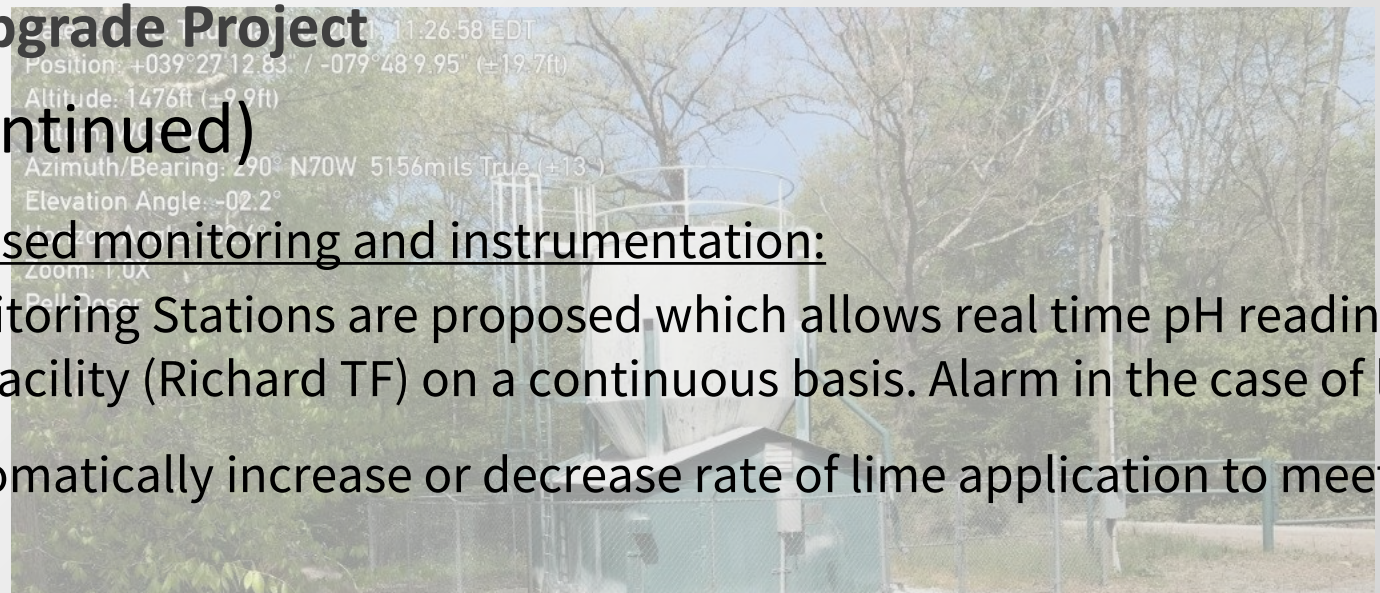
Background

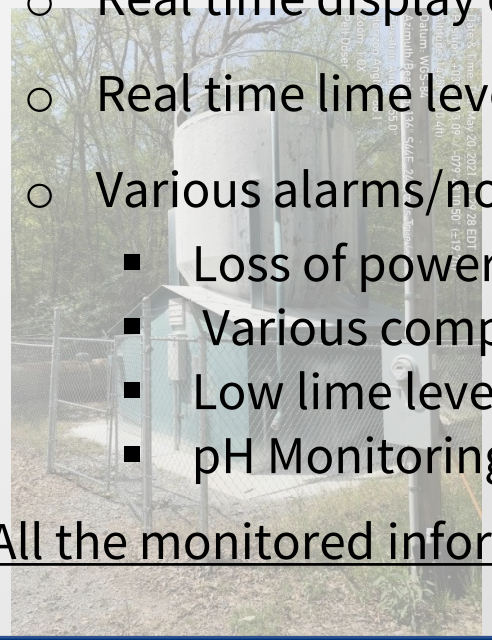
- Existing Pell Road Lime Doser was installed approximately 14 years ago and requires replacement with higher operational efficiency by use of advanced technology. Significant improvements have been made to the quality of the stream since 2010.
- Potential issues that may be resolved with the proposed monitoring and instrumentation control
  - Doser system is required to be checked twice a week by a technician or inspector.
  - Existing system is prone to issues, mostly related to clogging or lime bridging within the silo.
  - Stream has fluctuations in stream levels (precipitation), with no adjustment in lime rate.
  - Water quality sampling is only performed on a periodic basis and most likely only on downstream sample locations.
  - Loss of power to the existing doser may occur thereby no treatment to the stream would occur until either power restored or next visit by the inspector.

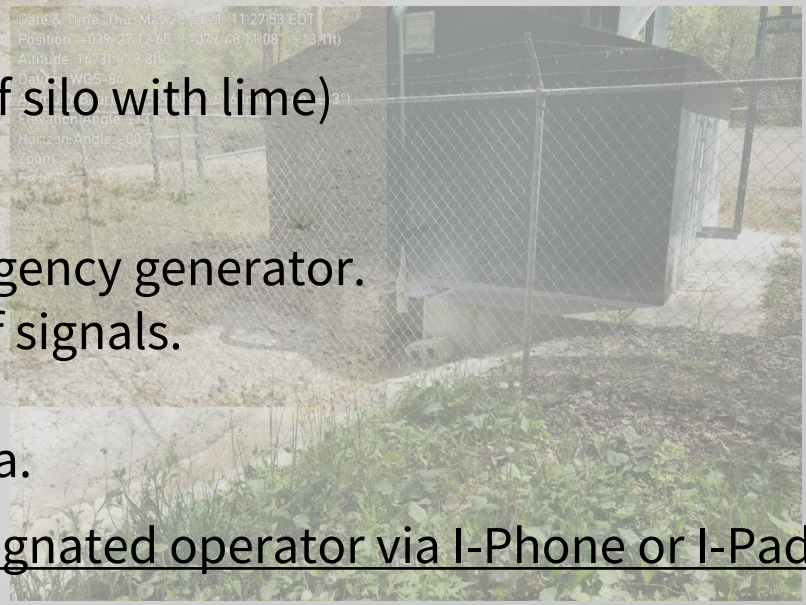
PELL ROAD Doser Upgrade Project

- Background (Continued)

- <u>Sampling of the proposed monitoring and instrumentation:</u>
  - Three (3) pH Monitoring Stations are proposed which allows real time pH readings at the Richard AMD Treatment Facility (Richard TF) on a continuous basis. Alarm in the case of loss of signal.
  - Capability to automatically increase or decrease rate of lime application to meet pre-set required pH levels.
  - Real time display of lime application rate.
  - Real time lime level in the silo. (Notification of when refilling of silo with lime)
  - Various alarms/notifications including but not limited to:
    - Loss of power to the doser facility with activation of emergency generator.
    - Various component failures such as pump failures, loss of signals.
    - Low lime level.
    - pH Monitoring Station pH readings outside pre-set criteria.
- <u>All the monitored information above would be available to the designated operator via I-Phone or I-Pad.</u>



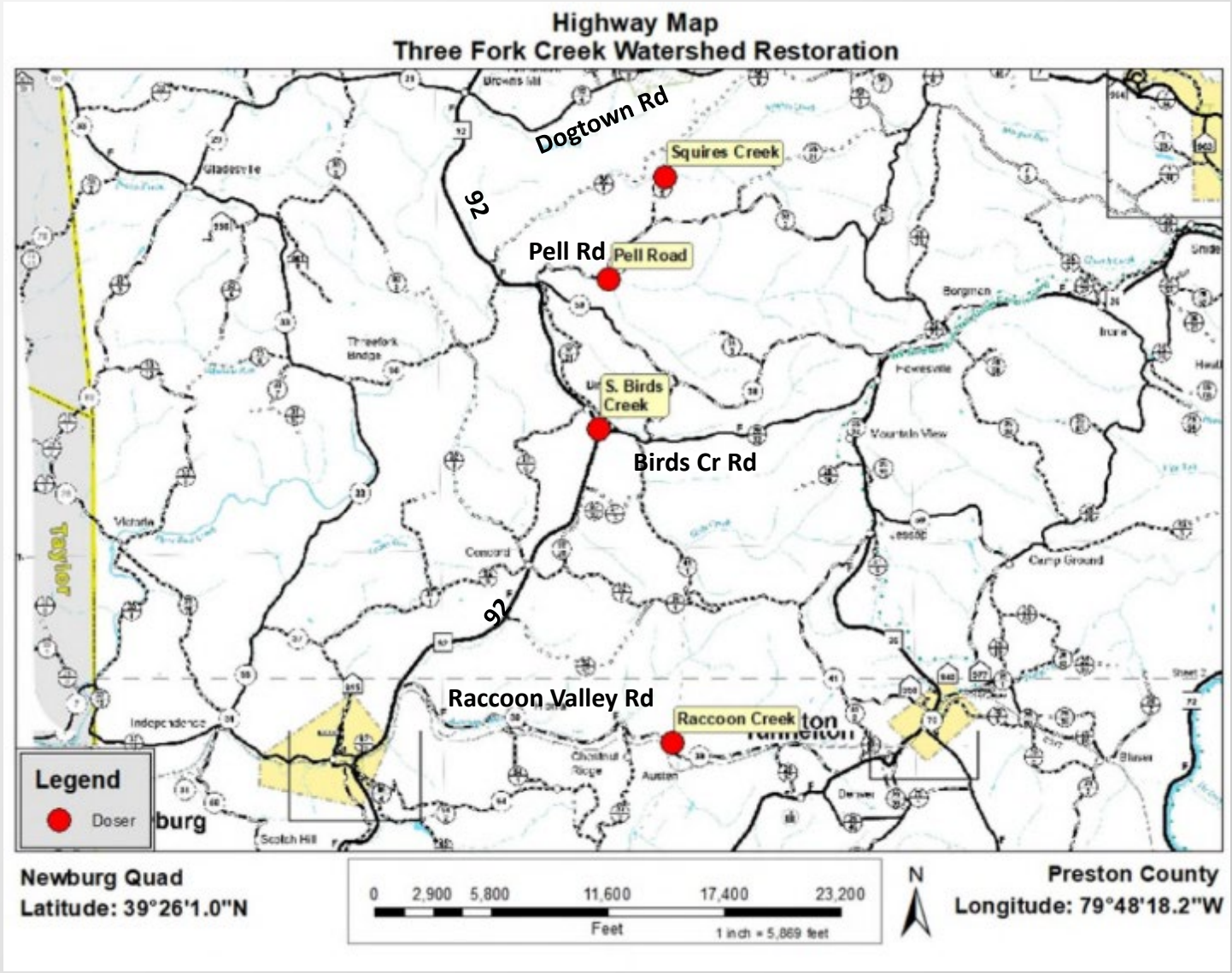




PELL ROAD DOSER UPGRADE PROJECT

(Part of Three Fork Restoration Remediation Area)

THREE FORK CREEK WATERSHED RESTORATION SITE LOCATIONS



EXISTING PELL ROAD HYDRATED LIME DOSER

WVDEP PELL ROAD DOSER UPGRADE PROJECT
GENERAL SCOPE & OBJECTIVES

GENERAL SCOPE AND OBJECTIVES

Proposed System

- Replacement of the existing Pell Road lime doser.
- The design of the New Pell Road Doser will include higher technology with adjacent instrumentation/electrical pre-fab building.
- Contractor to maintain existing doser operations until new doser has been constructed and operational.
- Proposed system services to be provided to the new Pell Doser:
  - Electric Service. (Extension of existing service to new doser location)
  - Water Supply Service Extension (Maintenance/Cleanup and Landowner water service)
  - Communications/Instrumentation/Monitoring system.
  - Paving of doser lot and access.
  - Locate new doser to location above the 100-year flood level.

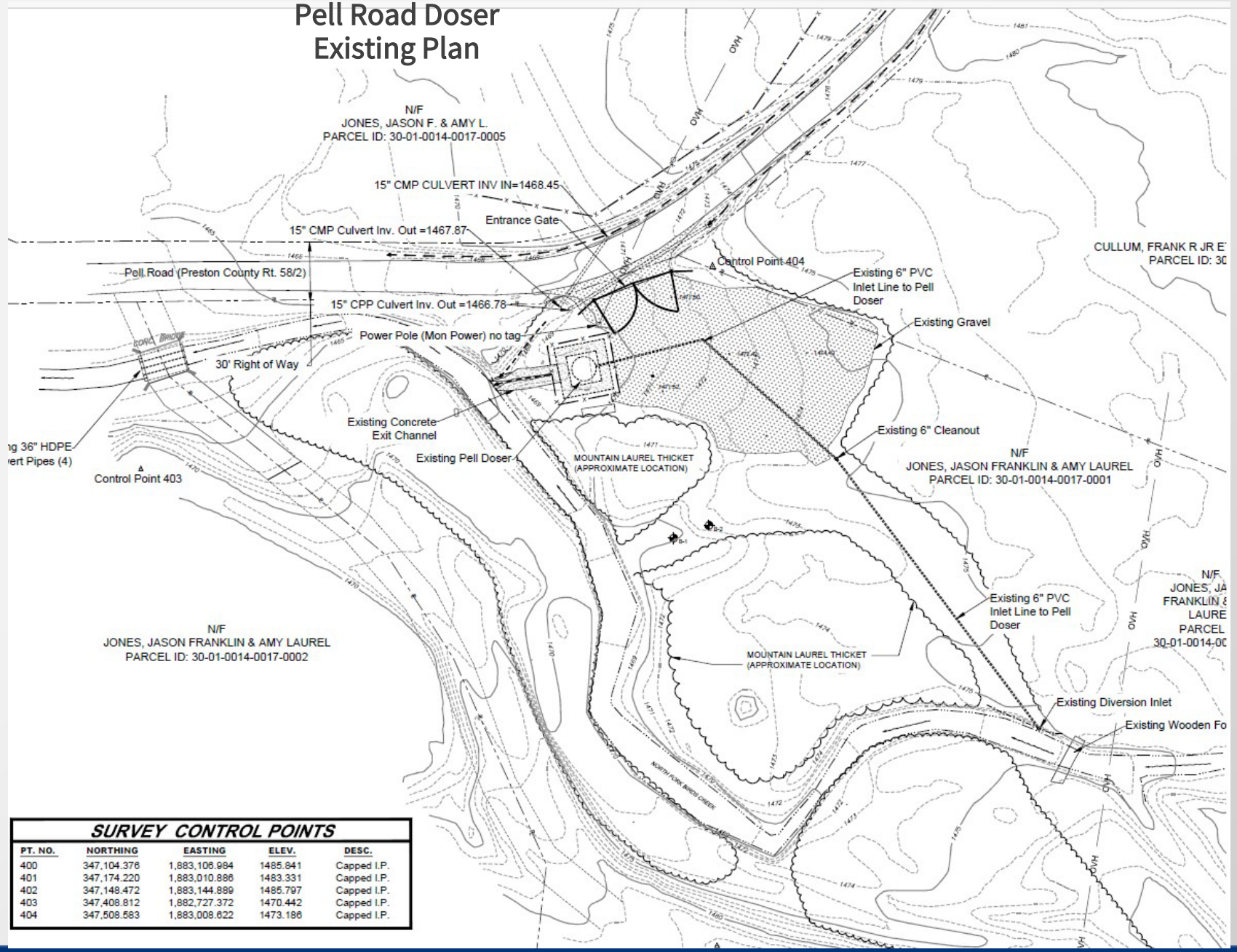
WVDEP PELL ROAD DOSER UPGRADE PROJECT
GENERAL SCOPE & OBJECTIVES

GENERAL SCOPE AND OBJECTIVES

Proposed System (Cont.)

- Remote capabilities to check and self adjusting treatment based on one (1) pH monitoring station upstream of treatment and two (2) pH monitoring stations installed downstream of treatment.
- All monitoring/control system to be relayed to the WVDEP AMD Treatment facility currently under construction. This facility is located in Richard, WV. (Southeast of Morgantown)
- Automatic control and adjustments of lime rate based on Monitoring Station readings will result in tighter control of pH discharge and significantly improved water quality from the watershed.
- Net reduction in Pell Road operation costs and increase in efficient operations with proposed new doser and the application of the higher technology and controls. NET GOAL IS TO LOWER COSTS WITH A HIGHER DEGREE & EFFICIENCY OF TREATMENT.

Pell Road Doser Existing Plan



SURVEY CONTROL POINTS

PT. NO.	NORTHING	EASTING	ELEV.	DESC.
400	347,104.376	1,883,106.984	1485.841	Capped I.P.
401	347,174.220	1,883,010.886	1483.331	Capped I.P.
402	347,148.472	1,883,144.889	1485.797	Capped I.P.
403	347,408.812	1,882,727.372	1470.442	Capped I.P.
404	347,508.583	1,883,008.622	1473.186	Capped I.P.

- Doser utilizes stream inlet and 6” PVC line as a water source for mixing lime dosage.
- Proposed doser is to be raised to above 100-year flood level.
- Existing water line to be extended (App 800’) to doser site.
- Existing gravel lot to be reconfigured for supply truck turnaround and paved.
- Upstream Monitoring Point 3 (inlet).
- Downstream Monitoring Point at Bridge.

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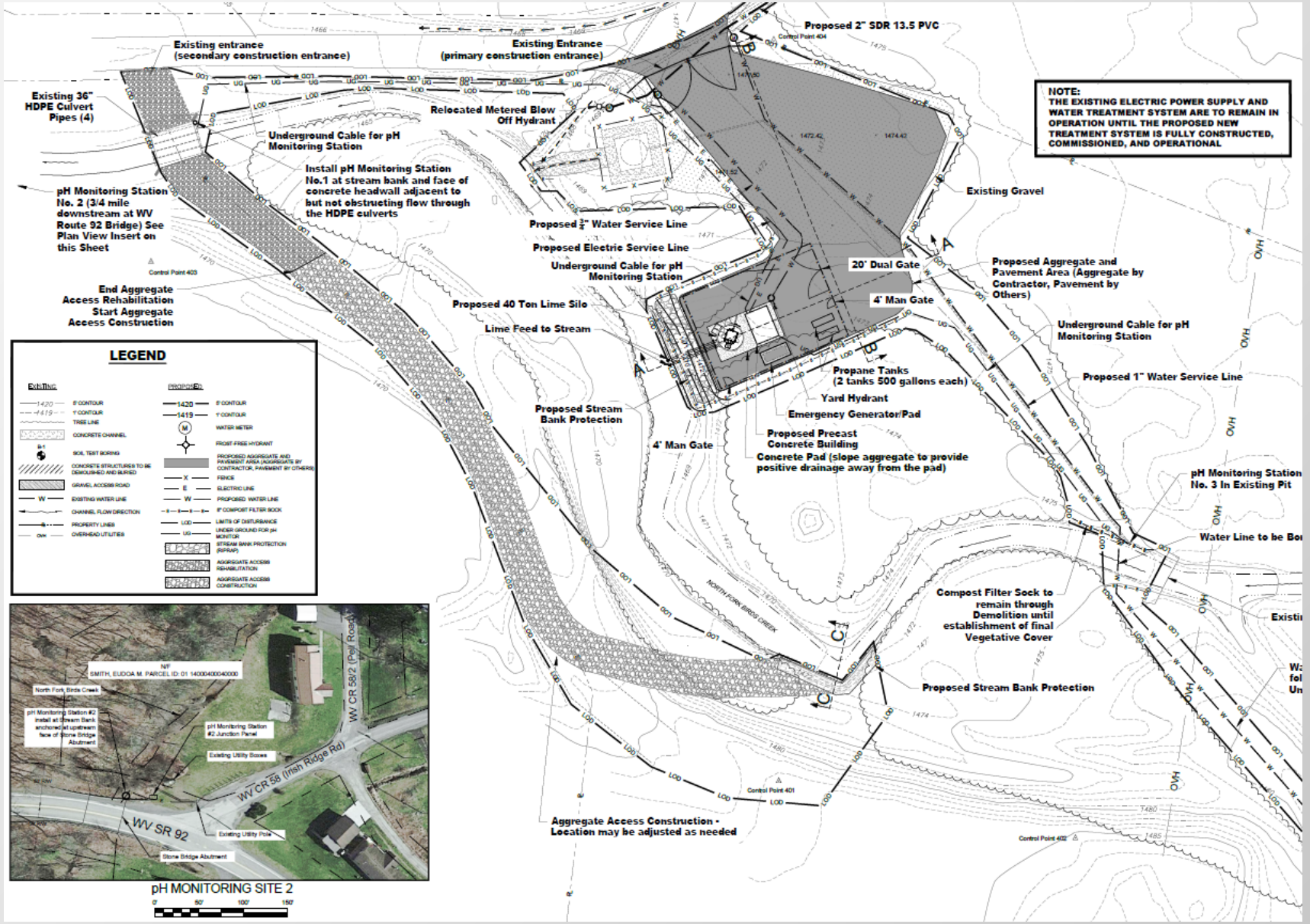
Pell (Aqua-Fix Auger System)

PROPOSED PELL ROAD HYDRATED LIME DOSER

Proposed Pell Doser Plan



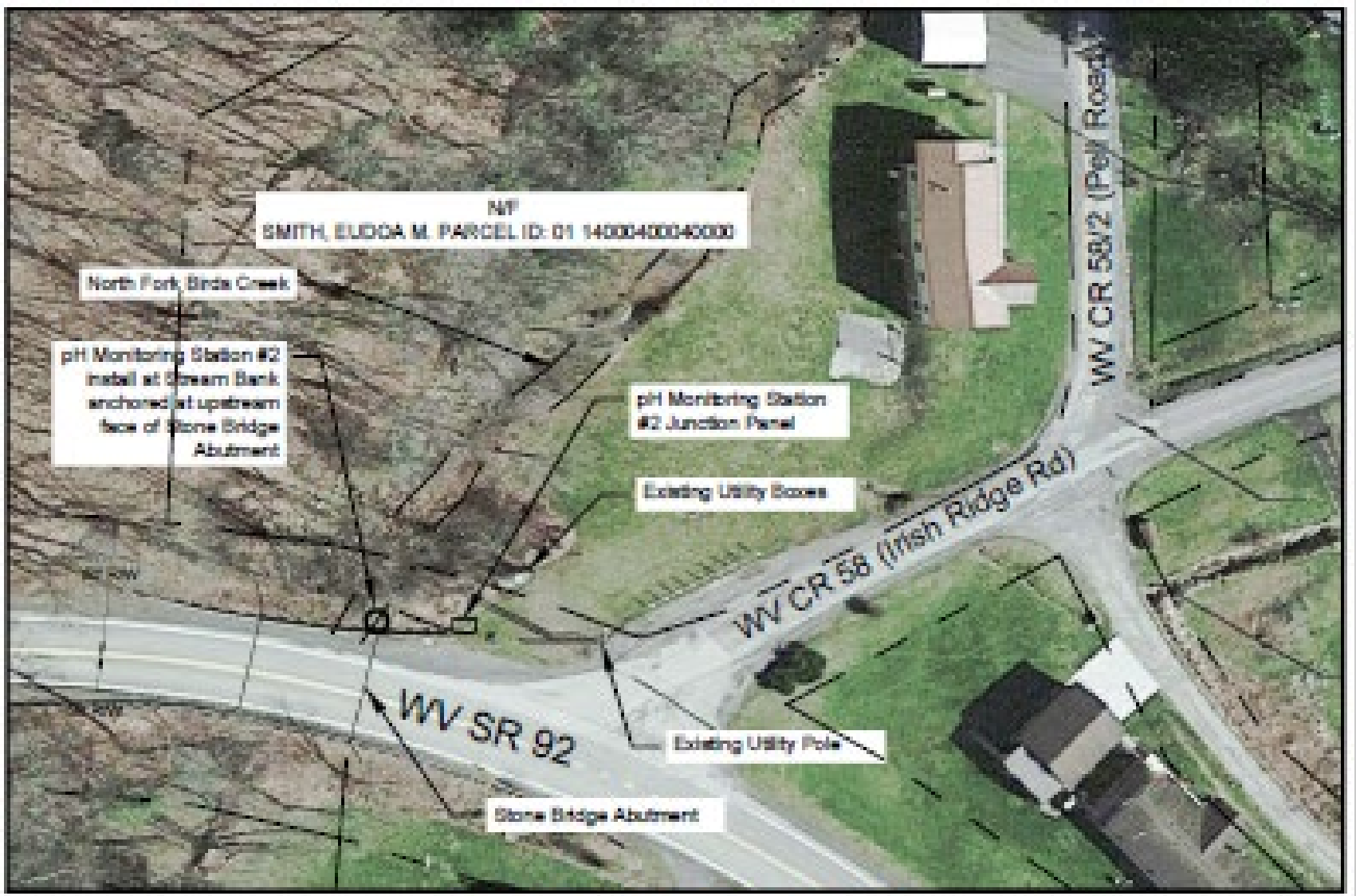
Pell Road Doser Upgrade Project

hydrated lime required per AMD Treat based on DEP samples				
lb/year	lb/day	lb/hr		Flow gpm
103,933	285	12	Median	737.83
199,011	545	23	Average	1,412.80
548,305	1,502	63	95th Percentile	3,892.48
hydrated lime required per DEP (20 tons per 45 days)				
324,444	889	37	DEP reported average usage	

North Fork Birds Creek Sample Data:

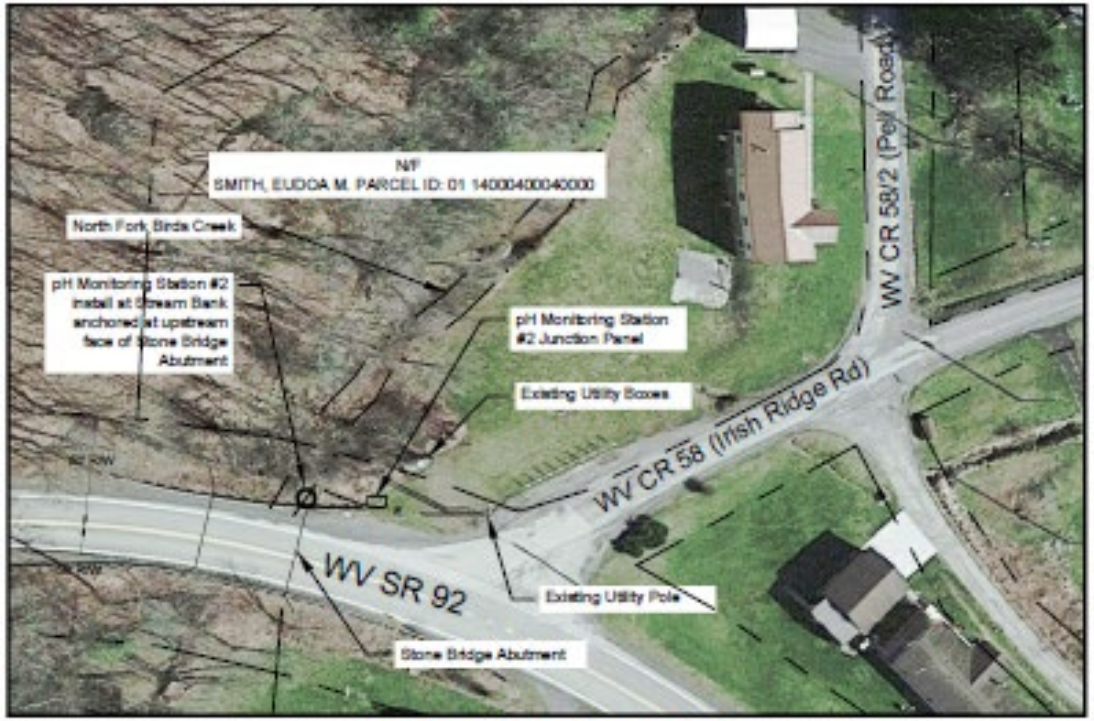
- Several years of raw water quality data provided by WVDEP.
- Existing Doser Capacity is 40 Tons.
- Current usage of lime as reported by WVDEP is 20 Tons in 45 days (324,444 lbs/Year).
- Per WVDEP sampling, pH ranges from 3.6 to 7.2 with an average pH = 4.5
- Median usage of lime is 12 lb/hr.
- Average usage of lime is 23 lb/hr
- 95th Percentile is 63 lb/hr

Pell Road Doser Upgrade Project



pH MONITORING SITE 2

Pell Road Doser Upgrade Project



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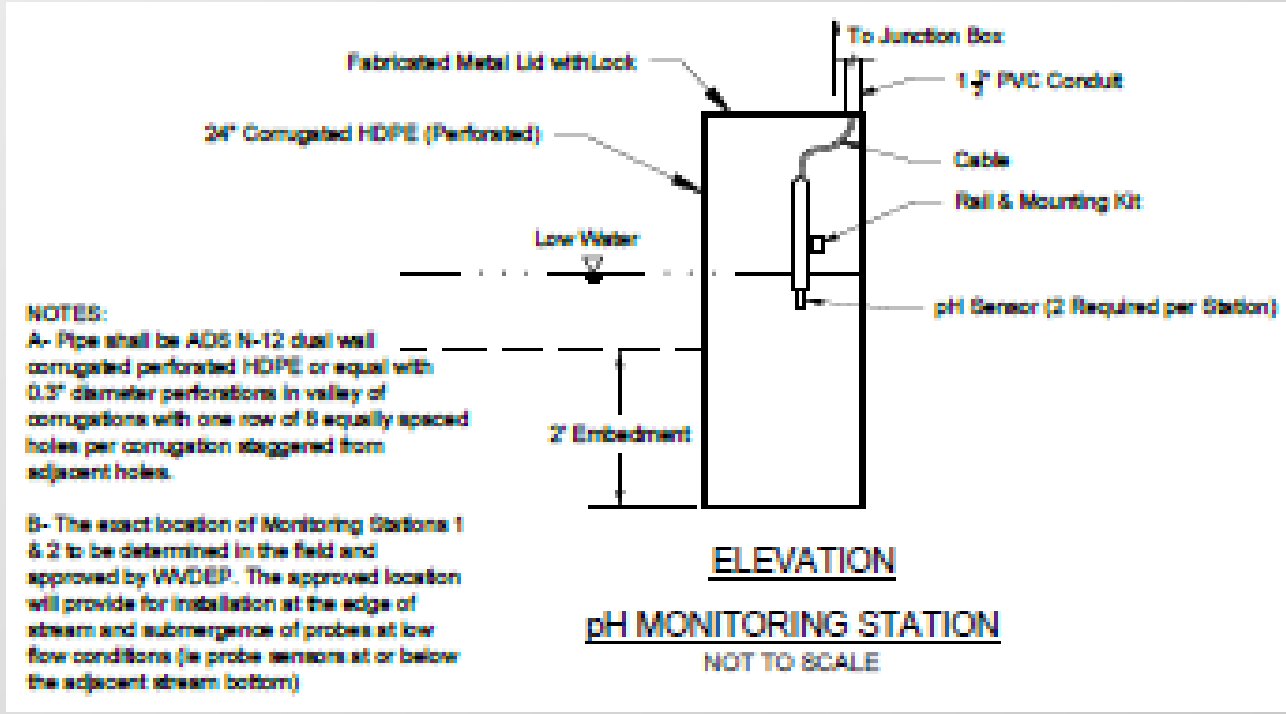

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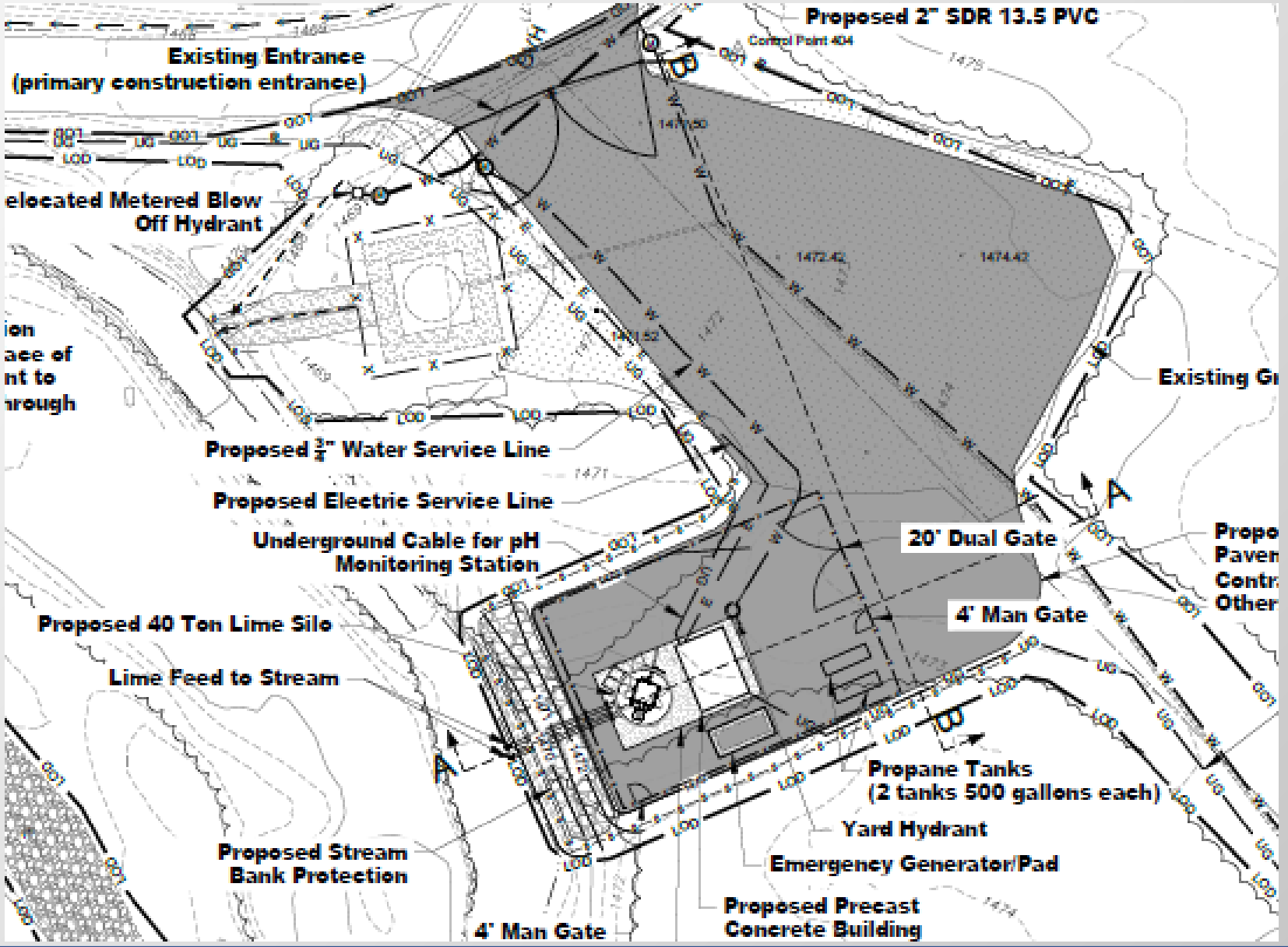

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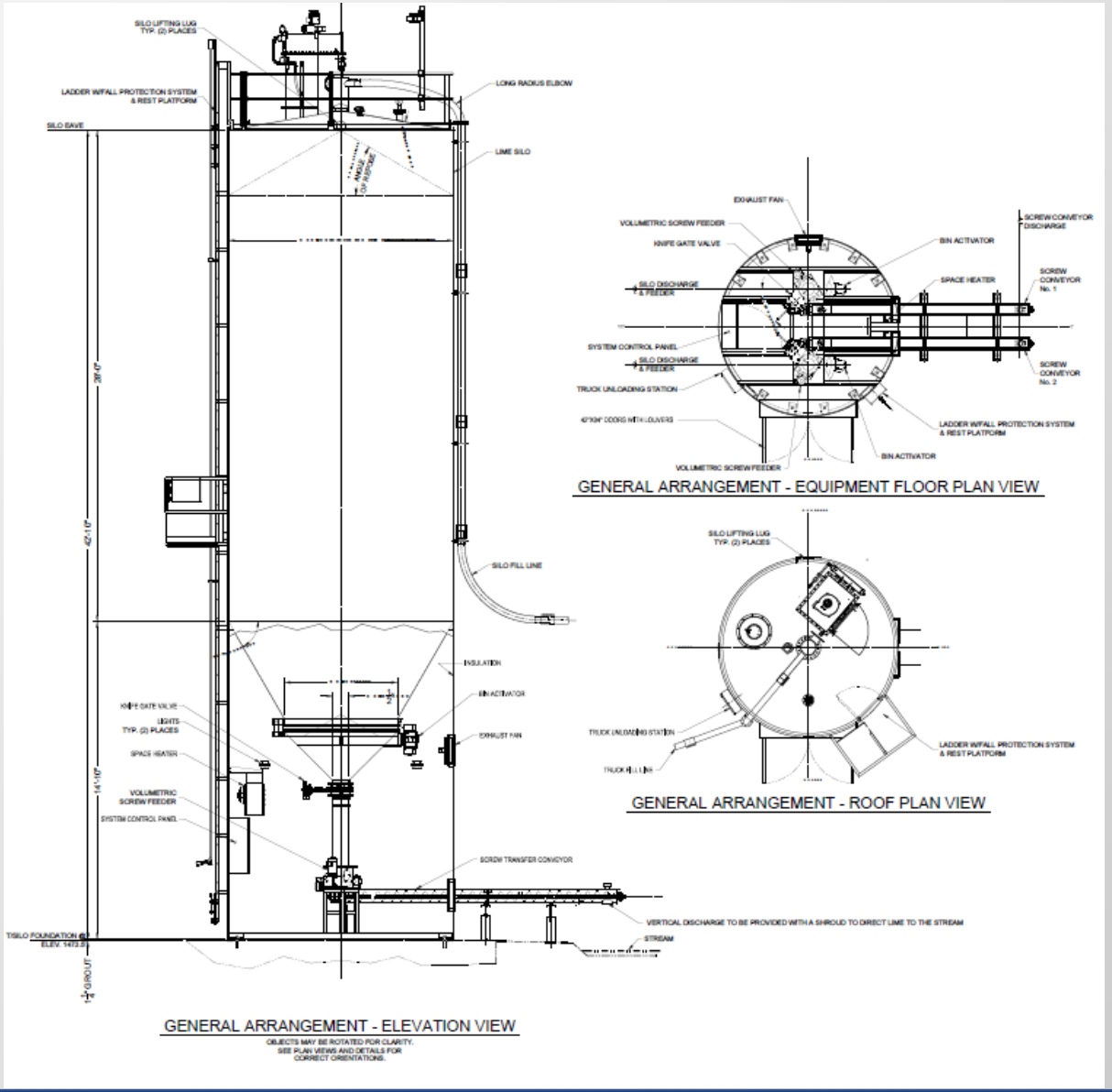

In Summary,

- The existing Dosers which have been operational for approximately 14 years and operated by WVDEP have performed well in making substantial improvements to the water quality of the Three Fork Creek Watershed.
- The goal and objective of the Pell Road Doser Upgrade project is to build upon the successes of the past in utilizing higher technology in developing a more efficient treatment system which will not only reduce the cost to WVDEP but also for the West Virginia taxpayer.
- Automated control and adjustments of lime rate based on Monitoring Station readings will result in tighter control of pH discharge and significantly improved water quality from the watershed.
- The proposed treatment will not only reduce the unit cost of treatment but will also reduce the WVDEP work force time previously utilized for site visits, maintenance and allow more efficient use of existing WVDEP personnel.
- Once constructed and operational, the Pell Road Doser operation may be evaluated as to cost savings and an evaluation of any additional improvements that may be recommended for future designs.

THANK YOU FOR YOUR ATTENDANCE AND ATTENTION!

QUESTIONS?