
Greenferry Water District Board Meeting

December 21, 2020

Agenda

- Review of Existing System
 - Updates to last presentation
- Review Growth Projection
- Future Demand and Production
- Review of Deficiencies and Potential Improvements
- Next Steps and Schedule

Demand and Production Review

Existing EDUs

- Estimated EDUs
 - Period Analyzed: June 2019 – May 2020

	Total Consumption (gallons)	Total Active Connections	Average Daily Consumption per Connection (gpd)	Total Active EDUs
Residential	52,679,000	340	424	340
Inactive		11		11
Vacant ¹		46		46
Total Obligated EDUs ²		397		397

Notes:

1. Remaining Bella Ridge lots and Riverview Heights
2. Does not include remaining lots at Cedar Creek because they have not paid Capitalization Fees

Summary of Demand

- Period Analyzed: June 2019 to May 2020

Total Current EDUs	397
Average Daily Production	163 gpm
Max. Daily Production	483 gpm
Peak Hourly Production	1,068 gpm

Capacity Analysis

Capacity Analysis

- Source
- Booster – No change
- Storage
- Distribution – No change
- Summarize Deficiencies

Source

Current Source Capacity:

- Well 1: 538 gpm
- Well 2: 602 gpm

**only 1 pump operates at a time

Total with Largest Source Offline: 538 gpm

Source Capacity (gpm)	EDUs	Current MDP + EQ (gpd)	Available Source Capacity with Largest Source Down (gpd)	Source Capacity Surplus or Deficit (-) (gpd)	Source Capacity Surplus or Deficit (-) (gpm)
Well Production	397	774,769	774,720 (538 gpm)	-49	0

*Total EDUs that can be served: 397

Storage

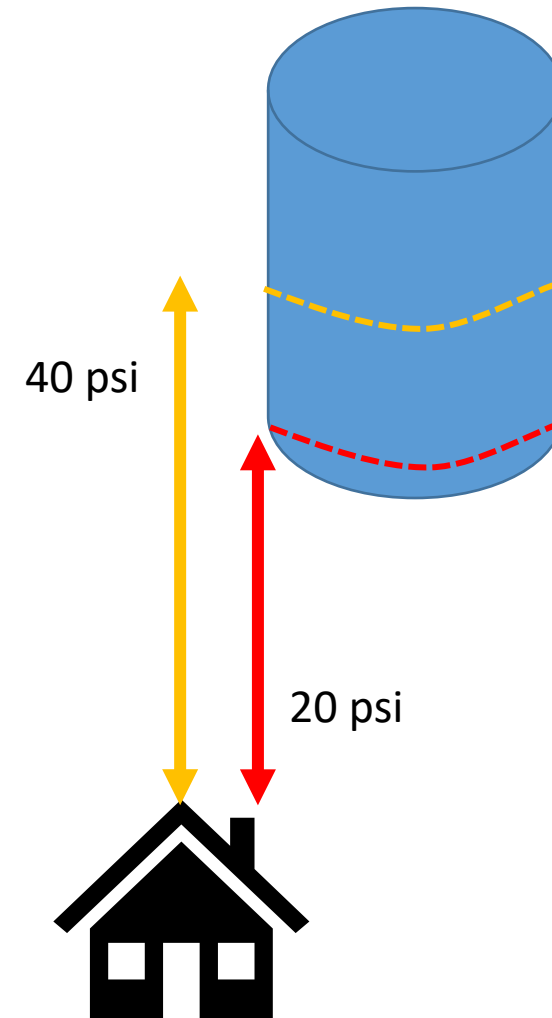
Current Storage Capacity:

- Highland: 150,000 gallons
- Snowshoe: 100,000 gallons
- Tanglewood: 120,000 gallons
- Bella Ridge: 120,000 gallons

	EDUs	Operating Storage (gallons)	Dead Storage (gallons)	Equalization Storage (gallons)	Standby Storage (gallons)	Fire Suppression Storage (gallons)	Total Storage Required (gallons)	Total Storage Available (gallons)	Storage Surplus or Deficit (-) (gallons)
Greenferry	353	24,974	145,220	61,798	69,384	180,000	481,375	370,000	-111,375
Bella Ridge	44	6,857	0	8,762	8,648	180,000	204,267	120,000	-87,267
Bella with Old FF	44	6,857	0	8,762	8,648	120,000	144,267	120,000	-24,267

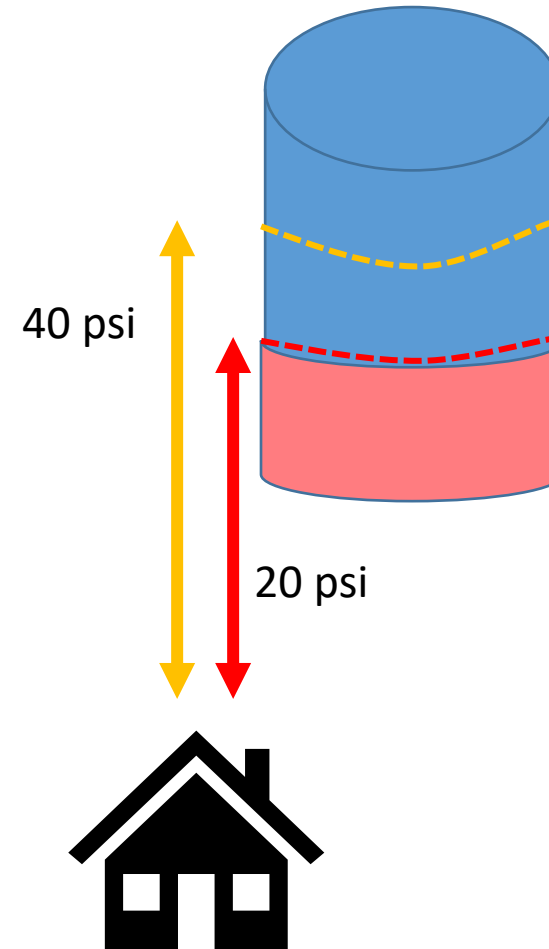
Dead Storage Concept

- Minimum level in tank to provide 40 psi during peak hour or 20 psi during fire flow
- No Dead Storage →



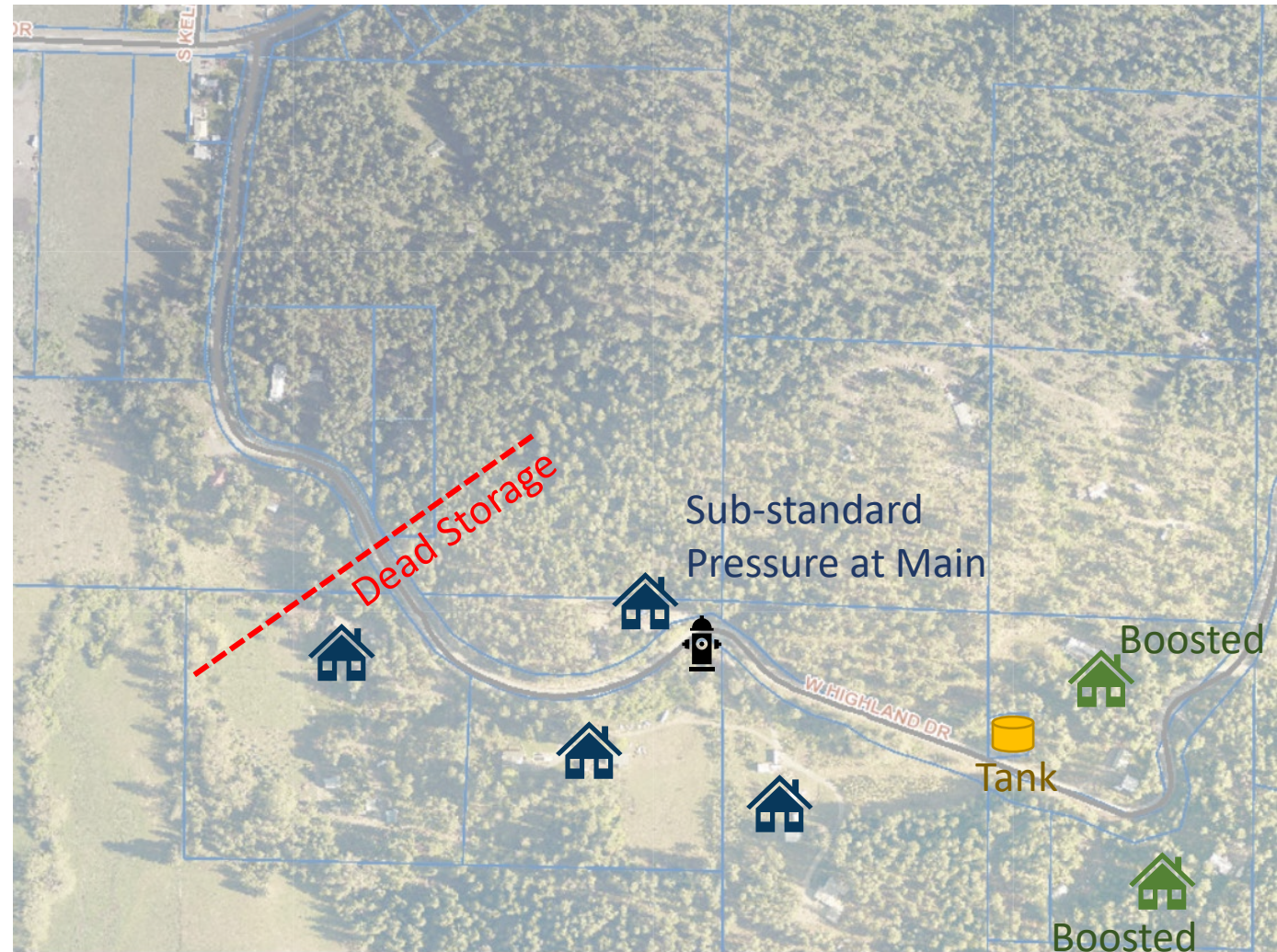
Dead Storage Concept

- Minimum level in tank to provide 40 psi during peak hour or 20 psi during fire flow
- Dead Storage →



Dead Storage at Highland

- Minimum level in tank to provide 40 psi during peak hour or 20 psi during fire flow
- Dead Storage Required



Current Deficiencies

- Booster Deficiencies –
 - Highland Booster Station – (-)5 gpm (due to single pump operation)
- Storage Deficiencies –
 - Main Datum – (-)111,375 gal (due to dead storage)
 - Bella Ridge – (-)24,267 gal (original fire flow) to (-)84,297 gal (current fire flow)
- Distribution System –
 - Peak Hour – Riverview South, Upper Highland and Cedar Creek
 - Fire Flow – widespread throughout system

Growth Projections

Growth Scenarios

- Growth A: Current Will Serves: Bayshore and Remaining Cedar Creek
- Growth B: Properties within District not currently served
- Growth C: Properties within District not currently served, subdivided to minimum lot size (buildout within District boundary)

Growth Scenario	Current	Growth A	Growth B	Growth C
Additional EDUs	-	63	91	67
Total EDUs	397	460	551	618

Future Demand

- Growth Rate: Assumed 2% as documented in ACE's report

Growth Scenario	Year	EDUs	ADP (gpm)	MDP (gpm)	PHP (gpm)
Current	2020	377	154	458	1,015
Growth A	2028	460	188	559	1,238
10-Year	2030	484	198	589	1,303
Growth B	2037	551	226	670	1,483
20-Year	2040	590	242	717	1,588
Growth C	2043	618	253	752	1,663

Future Demand - RAFN

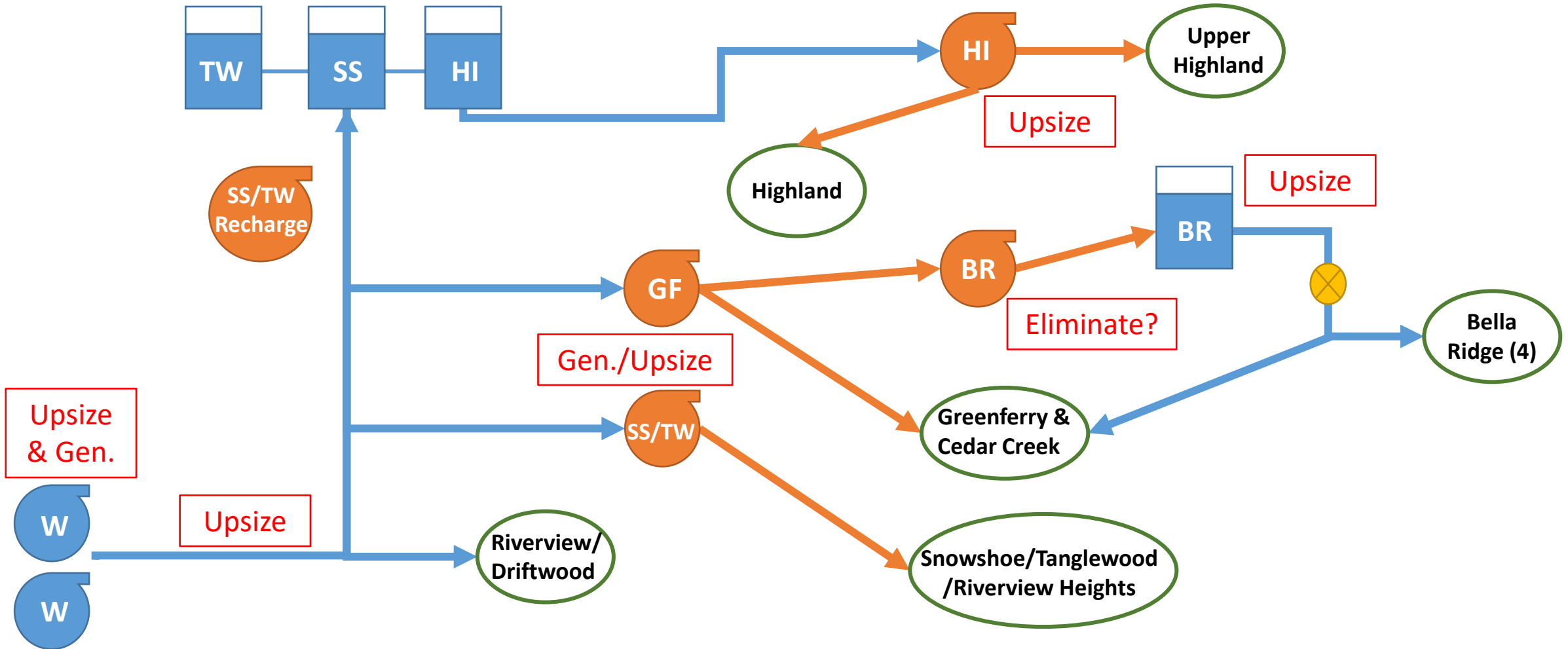
- Current Water Rights:
 - Total License and Permit: 2.05 cfs
 - Total RAFN: 4.63 cfs
- Projection by IWRRI, filed in 2015 for 30-year development period (2045),
 - Includes area outside current District boundary
 - Total Water Right Needed: 6.68 cfs
- Current Projection based on Facility Plan for 2045
 - Includes area inside current District boundary
 - Total Water Right Needed: 1.76 cfs

Summary of Future Capacity

	Current	Growth A	Growth B	Growth C
Source	0 gpm	-82 gpm	-218 gpm	-317 gpm
Boosters				
Snowshoe/Tanglewood	20 gpm	-53 gpm	-69 gpm	-77 gpm
Greenferry	15 gpm	15 gpm	-15 gpm	-43 gpm
Bella Ridge	0 gpm	0 gpm	-30 gpm	-58 gpm
Highland	-5 gpm	-5 gpm	-5 gpm	-5 gpm
Storage				
Greenferry	-111,375 gal	-149,189 gal	-203,810 gal	-241,024 gal
Bella Ridge	-24,267 to -84,267 gal	-84,267 gal	-84,267 gal	-86,668 gal
Distribution	Peak Hour constraints at Riverview South, Upper Highland and Cedar Creek Fire Flow unavailable at full requirement throughout system			

Proposed Improvements

Proposed Facilities



Options for Source

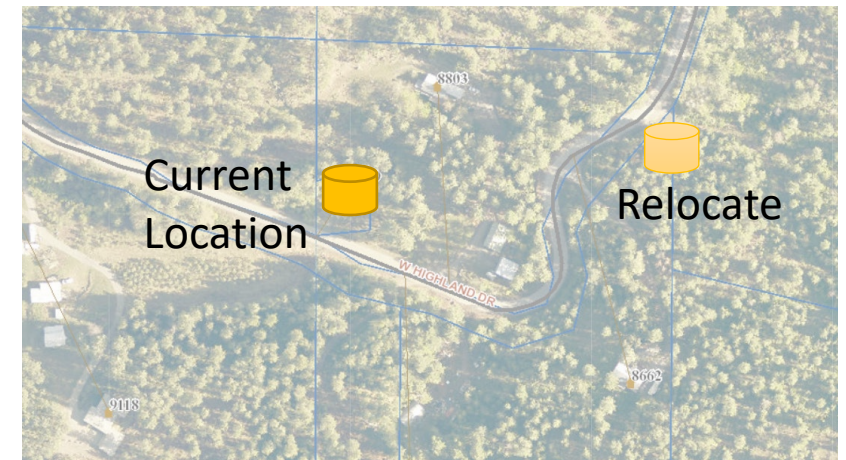
- Upsize Wells and Add Generators
 - Provide more source capacity
 - Eliminates standby storage requirement
 - Options:
 1. Well Pump Upsize: 850 gpm each (Growth C)
 - Adds 287 connections, total 684
 - Check proximity to nearby septic systems
 - Replaces deteriorated asset
 2. Add Well No. 3: 600 gpm
 - Adds 539 connections, total 936
 - Review potential sites

Options for Source

	Options	Estimated Project Cost
1	Replace Pumps and Upsize, Add Generator	\$700,400
2	Add 3 rd Well	\$945,000

Options for Highland Dead Storage

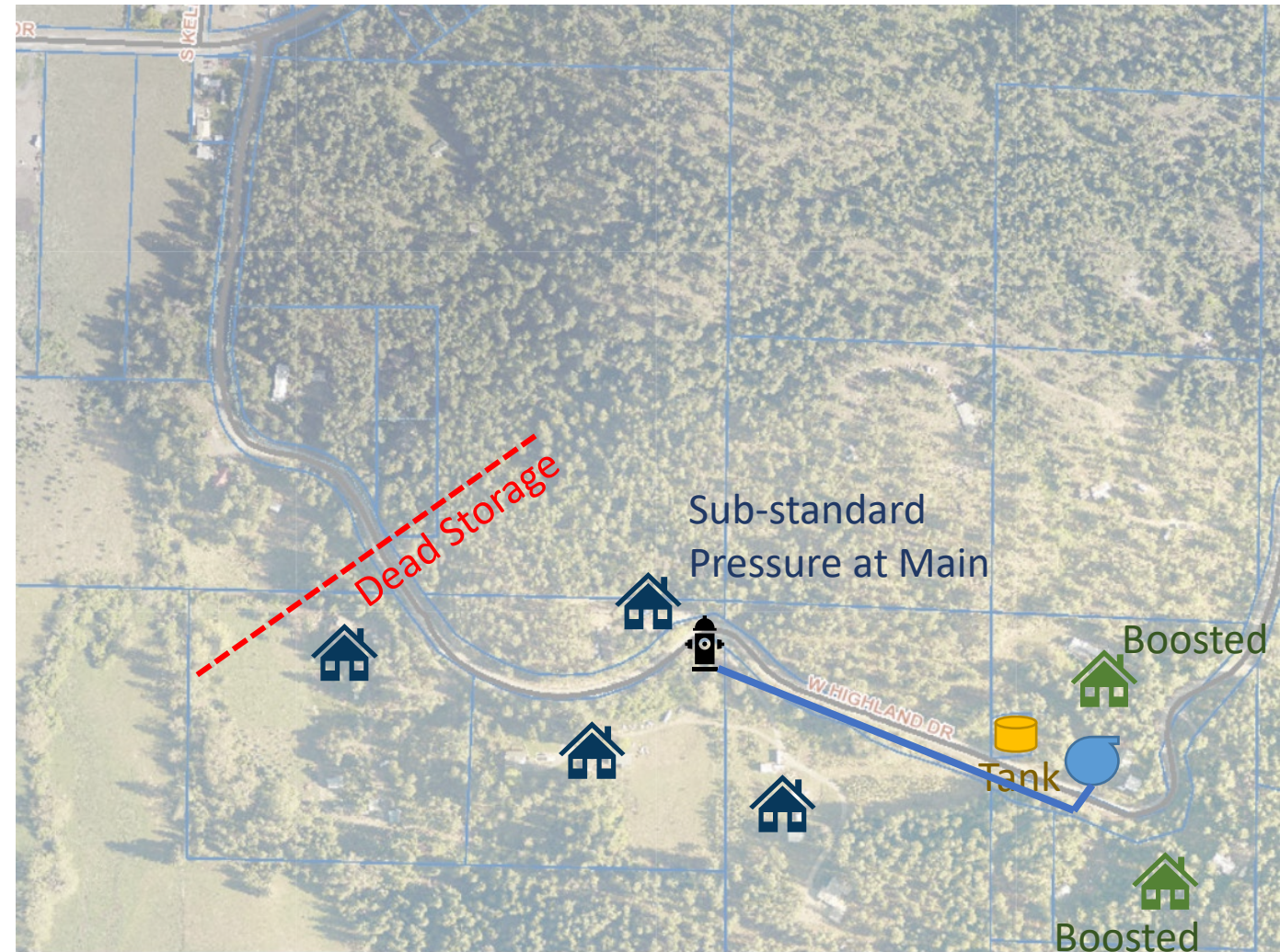
1. Increase Height of Tank to allow for dead storage
 - Potential hydraulic issues
 - Achieves replacement of Highland Tank
2. Relocate Tank further up the hill
 - Potential hydraulic issues
 - Achieves replacement of Highland Tank
 - Reconfigure Upper Highland Booster



Options for Highland Dead Storage

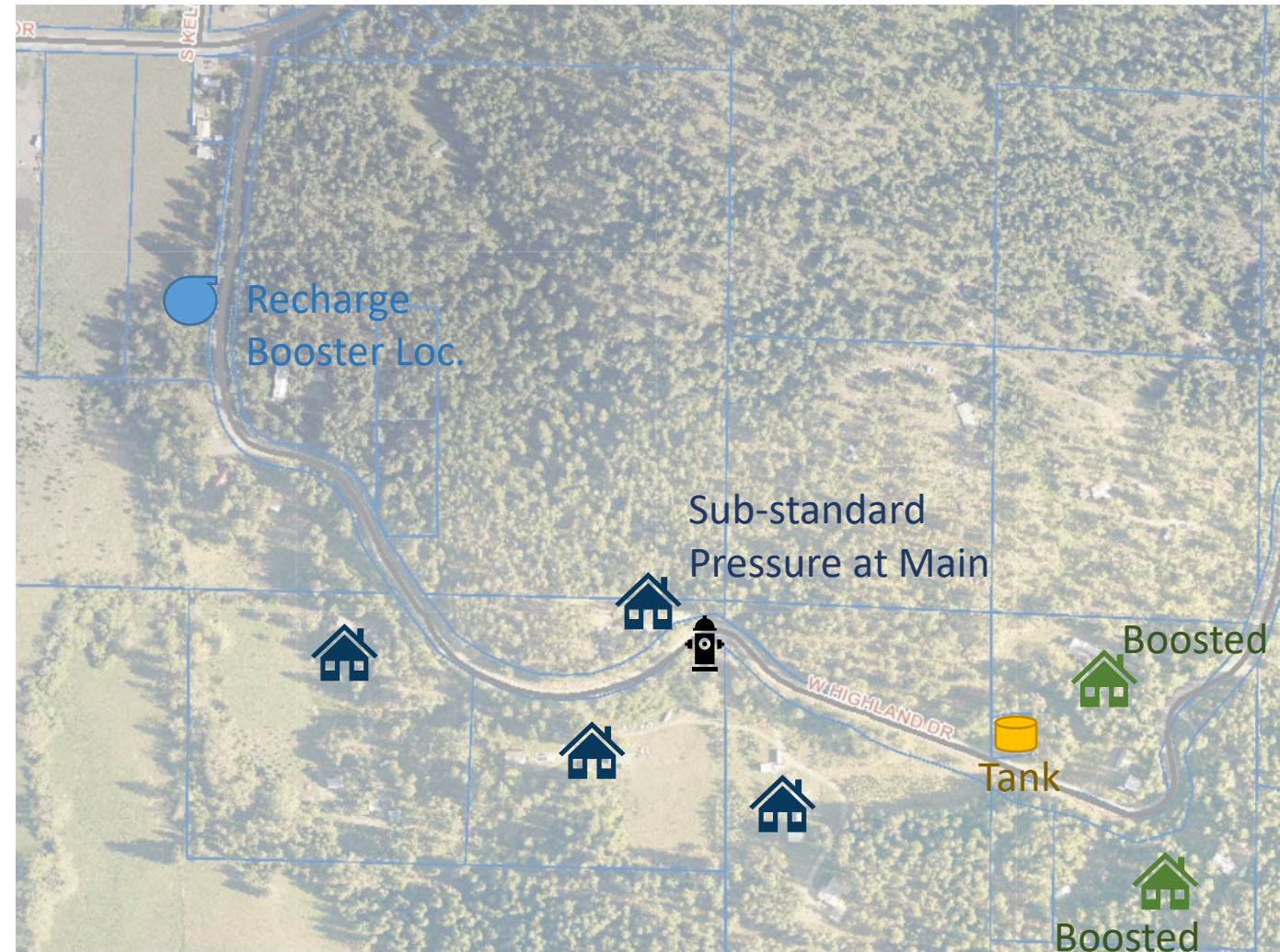
3. Reconfigure Upper Highland Booster to feed 4 services

- Improvements:
 - Add booster pumps
 - Add fire pumps
 - Install 8-inch main to end of existing 3-inch
- Considerations:
 - Does not replace Highland Tank
 - Requires 3-phase power (costly)



Options for Highland Dead Storage

4. Request individual booster stations from IDEQ and reduced fire flow from Fire District (~500 gpm fire flow available)
5. Per ACE – install recharge booster and configure to feed 4 services



Options for Highland Dead Storage

	Options	Estimated Project Cost
1	Increase Height of Tank (standpipe)	\$655,700
2	Relocate Tank	\$599,500
3	Reconfigure Upper Highland Booster	\$602,600
4	Request Individual Booster Stations and Reduced Fire Flow	\$57,500
5	Per ACE – Install Recharge Booster and Configure for Services	Portion of \$489,196 Booster Project #4

Options for Cedar Creek

1. Relocate Greenferry Booster Station and Utilize Greenferry Bypass for Fire Flow
 - Fire Flow – 1,500-1,800 gpm
2. Reconfigure Greenferry and Utilize Greenferry Bypass for Fire Flow
 - Short-term solution
 - Adds third pump to existing station – may require 3-phase power
 - Fire Flow – 1,000-1,200 gpm



Options for Cedar Creek

	Options	Estimated Project Cost
	Greenferry Bypass (for all options)	\$95,000
1	Relocate Greenferry Booster Station	\$300,700
2	Reconfigure Greenferry	\$269,500

Proposed Capital Improvement Plan

	Description	Issue Addressed	IDEQ Req	5-year	10-year	20-year
Source	Well Pump Replacement / New Well	Non-Fire Flow Capacity	yes	\$945,000		
	Generators (included in Well Work)	Reliability - Operation				
Storage	Bella Ridge Expansion	Fire Flow			\$357,000	
	Highland Replacement	Reliability - Maintenance			\$280,000	
	SCADA Upgrades	Reliability - Operation				\$99,160
Booster	Upper Highland Booster Exp	Fire Flow – System Pressure	yes		\$602,600	
	Greenferry Booster Replacement	Fire Flow – System Pressure	yes		\$300,700	
	Greenferry Bypass	Reliability - Operation			\$95,000	
	Riverview Upsize	Fire Flow				\$1.17 M
	Greenferry Upsize	Fire Flow				\$449,100
	Transmission from Wells to Greensferry Rd	Non-Fire Flow Capacity	yes	\$498,125		
	Crystal Bay Upgrades	Fire Flow				\$1.1 M
	Greenferry Terrace Upgrades	Fire Flow – Reliability – Operation			\$1.1 M	
	Snowshoe/Tanglewood Upgrade	Fire Flow				\$637,020
Maintenance	Easement	Reliability – Operation				\$50,000
Total				\$1.45 M	\$2.7 M	\$3.5 M

5-Year Projects Review

- Well Pump Replacement Upgrade
 - Submit Test Pump Procedure and Conduct Test Pumping
 - Prepare Design Plans & Specifications
 - IDEQ could approve directly after “conditional approval” of Facility Plan
- Transmission from Wells to Greenferry
- Total for Base 5-Year Projects: \$1.45 million
- Potential Add-ons:
 - Greenferry Bypass - \$95,000
 - Greenferry Terraces - \$1,056,000
 - Modeling shows upgrades alone (without well improvements) will increase fire flow from 480 gpm to 1,180 gpm under current demands
- Available funding: \$2.3 million

IDEQ Process - Schedule

	2020			2021												2022			
	N	D		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A
Complete Draft		█	█	█															
Submit Draft to District				█															
Address comments					█														
Submit Draft to IDEQ						█	█	█	█	█	█	█	█	█	█				
IDEQ Review						█	█	█	█	█	█	█	█	█	█				
Address comments										█									
Technical Approval												█							
Public Meeting													█						
Public Comment Period													█	█					
Board Meeting to Adopt														█					
Final Draft to IDEQ															█				
Environmental															█	█	█	█	█
Grant Closeout																			█

WC Contract Review

- Original Tasks
 - Water Facility Plan
 - Modeling
 - Meetings
 - Environmental
- Updated Tasks
 - Developed comparison to original data/report
 - Detailed modeling of future improvements
 - Additional meetings
 - Reduced environmental scope
 - RAFN Coordination

Next Steps

- Confirm/update recommended alternatives tonight
 - Well Investigation – test pump procedure to IDEQ?
- Prepare written report and submit to District by early January
- Finalize written report and submit to IDEQ by mid to late-January
- Coordinate with Bob Haynes on RAFN, if requested

Extra Slides

Terminology

Equivalent Dwelling Unit (EDU):

- A unit of measure that standardizes all land use types (housing, retail, office, etc.) to a level of demand created by a single-family detached housing unit within a water system

Examples:

- Typical single-family household uses 300 gallons per day (i.e. 1 EDU = 300 gpd)
- Commercial connection uses 600 gallons per day, the commercial accounts for 2 EDUs

Terminology

Demand:

- Average Daily Demand (**ADD**): average volume of water calculated over the year
- Maximum Daily Demand (**MDD**): maximum gallons of water used in one day
- Peak Hourly Demand (**PHD**): maximum gallons of water used in one hour

Production:

- Average Daily Production (**ADP**): average volume of water produced over the year
- Maximum Daily Production (**MDP**): maximum volume of water produced in one day
- Peak Hourly Production (**PHP**): maximum gallons of water produced in one hour



Overview of Pertinent Rules

IDAPA 58.01.08



Source

Supply PHD with largest source offline or MDD plus equalization storage with largest source offline

Booster Facilities

- Supply MDD plus Fire Flow (if pumped) with any pump out of service
- Supply PHD with any pump out of service

Storage

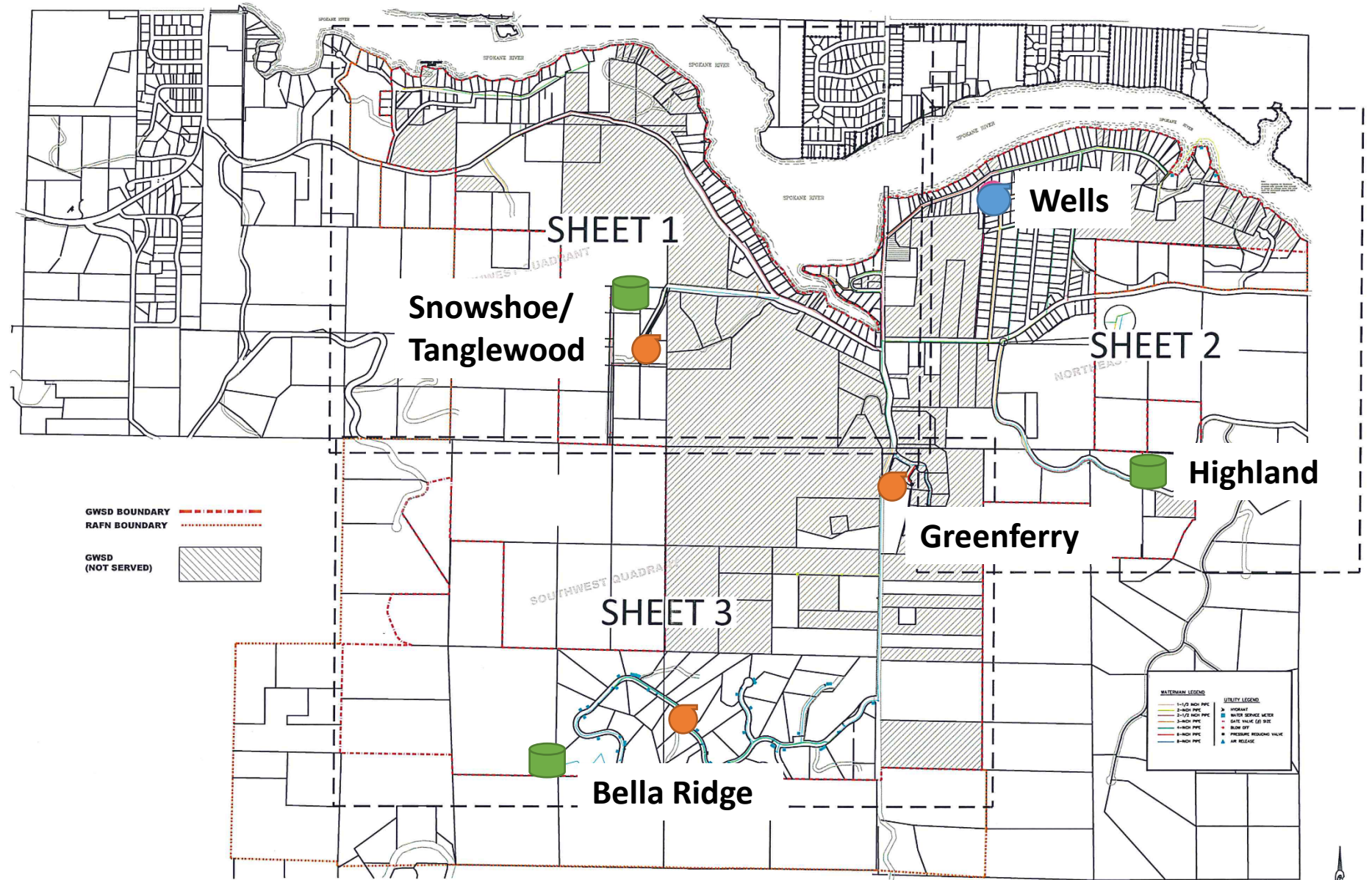
- Operational Storage: volume allocated to pump control
- Equalization Storage: volume to supply PHD over 150 min.
- Standby Storage: volume to supply 8 hours of average day demand (not required with generators)
- Fire Suppression: volume specified by local fire authority
 - 1,500 gpm for 2 hrs
 - (past) 1,000 gpm for 1 hr

Distribution

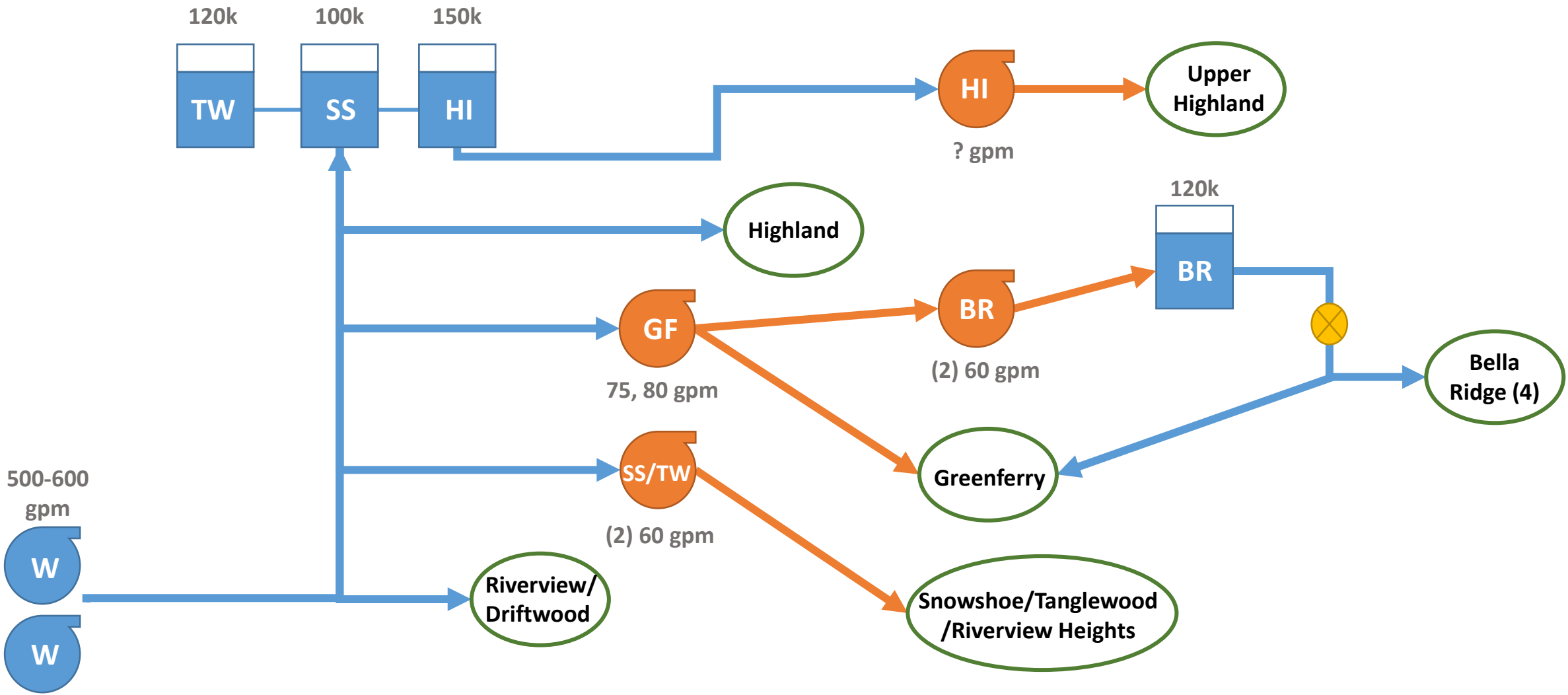
- Water mains with Fire Hydrants shall not be less than 6-inch diameter
- Water mains without Fire Hydrants shall not be less than 3-inch diameter
- Maintain 40 psi minimum pressure throughout system during PHD
- Maintain 20 psi minimum pressure throughout system during MDD plus Fire Flow

Existing System Overview

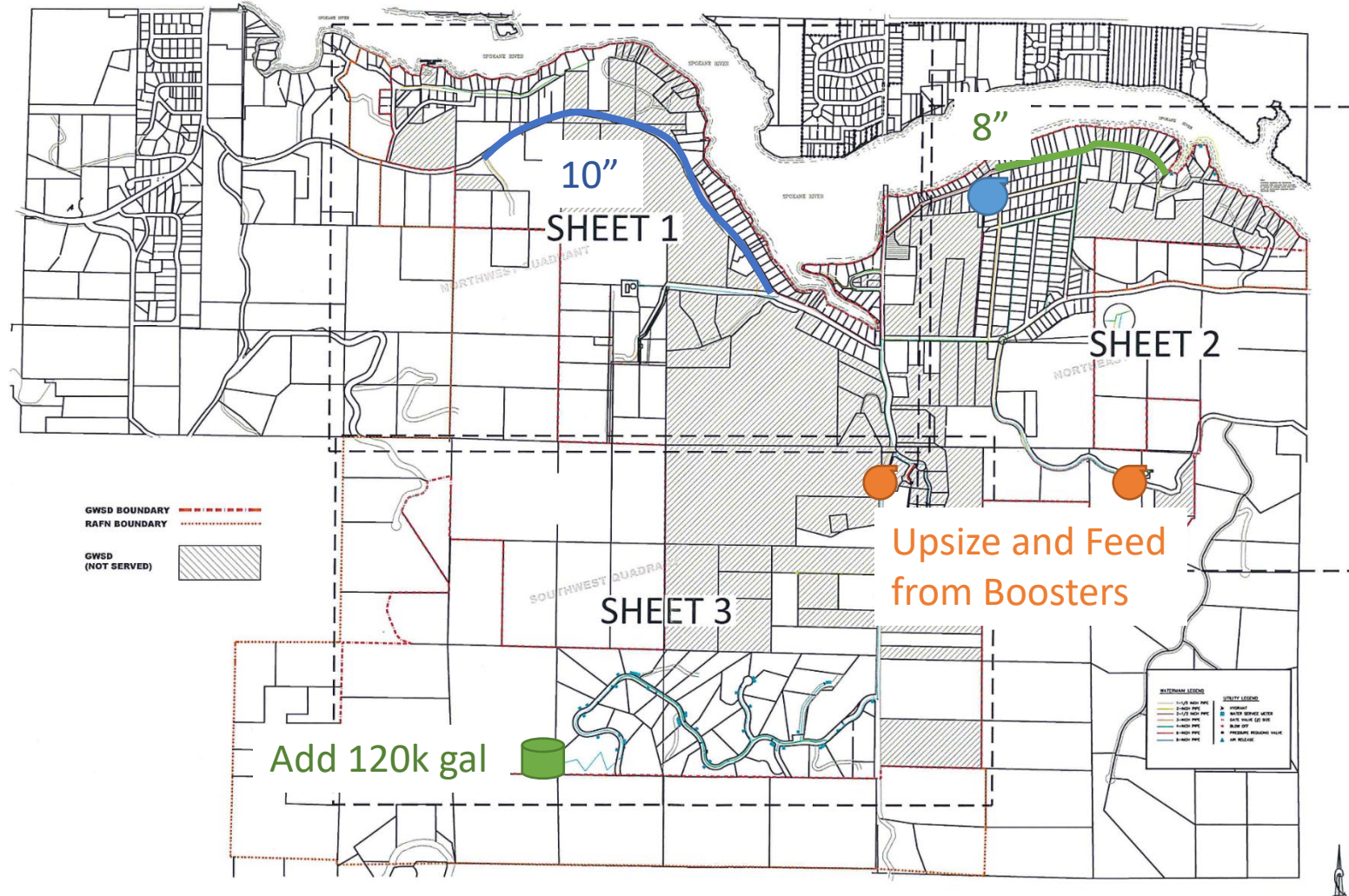
Map provided by ACE



Existing Facilities

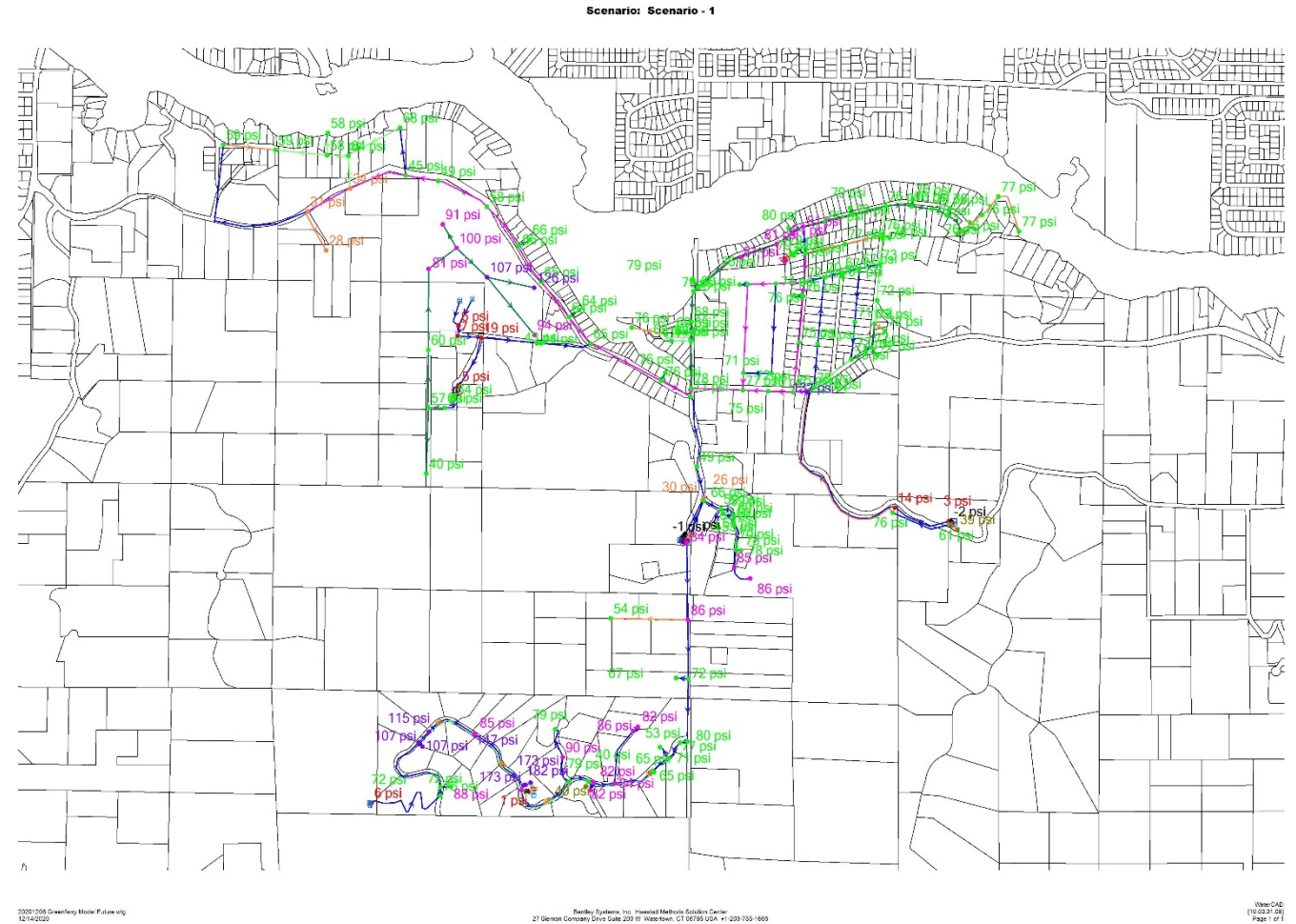


Proposed Facilities (Welch Comer)



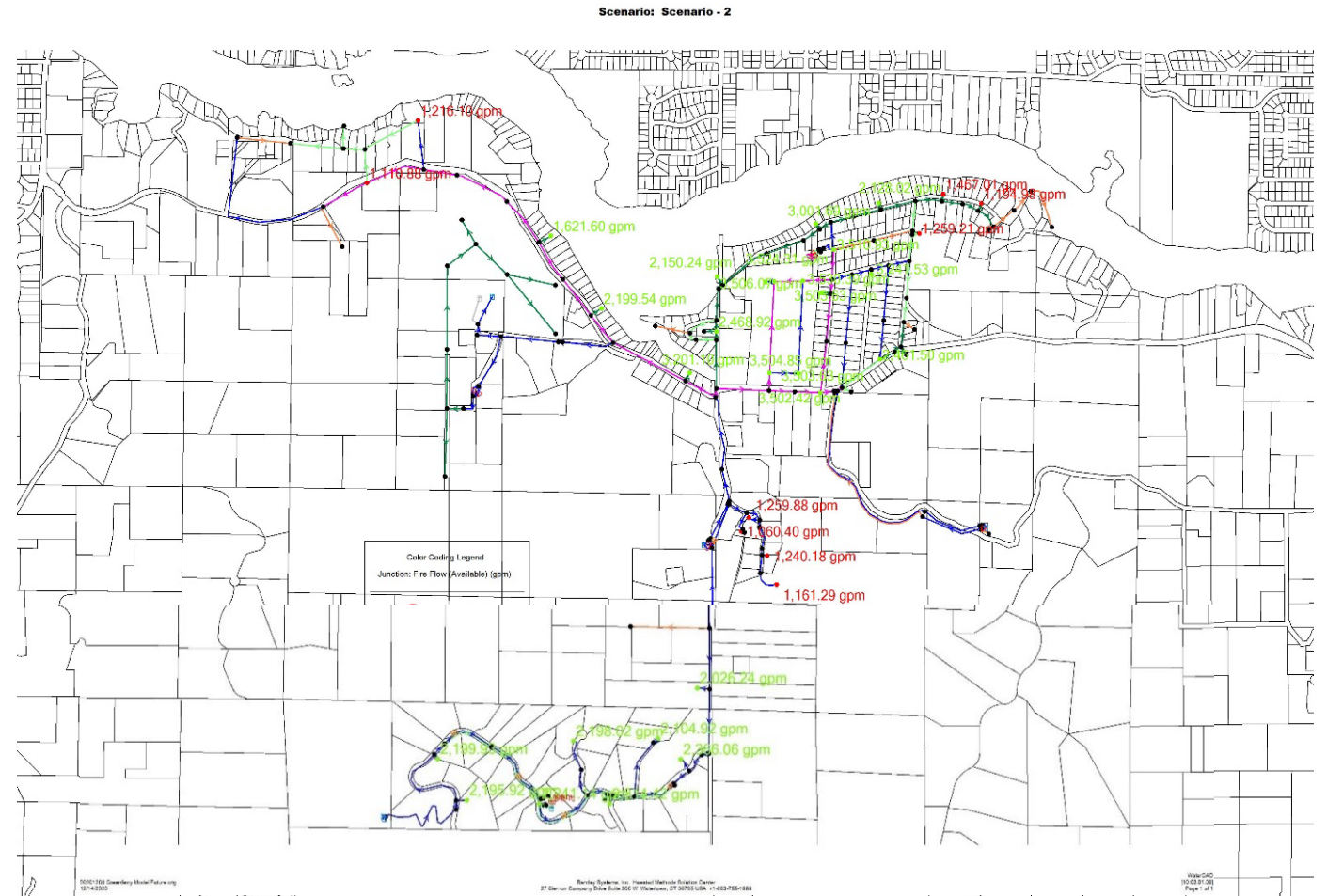
Proposed Facilities (Model Results)

- Scenario 1: Meets requirements
 - Reduces high pressure in Terraces
 - Increases pressure in low areas



Proposed Facilities (Model Results)

- Scenario 2: Meets requirements
 - Ranges: 1,100 – 2,650 gpm
 - Cedar Creek, Terraces over 1,000 gpm – likely acceptable due to when the systems were approved by Fire District



Proposed Capital Improvement Plan

	Description	WC/ACE	Estimated Cost	Short-Term	Long-Term
Source	Well Pump Replacement / New Well	WC	\$945,000	X	
	Generators	ACE	\$140,900	X	
Storage	Bella Ridge Expansion	WC	\$357,000	X	
	Highland Replacement	ACE	\$280,000		X
	SCADA Upgrades	ACE	\$99,160		X
Booster	Upper Highland Booster Exp	WC	\$500,700	X	
	Greenferry Booster Exp	WC	\$210,700	X	
	Greenferry Bypass	ACE	\$95,000	X	
	Riverview Upsize	WC	\$1,170,400		X
	Greenferry Upsize	WC	\$449,100		X
	Transmission from Wells to Greensferry Rd	ACE	\$498,125	X	
	Crystal Bay Upgrades	ACE	\$1,102,440		X
	Greenferry Terrace Upgrades	ACE	\$1,055,687	X	
	Snowshoe/Tanglewood Upgrade	ACE	\$637,020		X
Maintenance	Easement	ACE	\$50,000		X
Total			\$7.6 million	\$3.8 million	\$3.8 million

Bayshore

- Existing Will Serve
 - Transmission (10”) and looping
 - Land for Highland Booster Site and Well Site
- Proposed Addition
 - Participate in capacity improvements to source through Mitigation Fee
 - Well Pump Replacement
 - Estimated \$700,400 for 306 connections = \$2,288.89 per connection
 - Total of approximately \$130,446.67
 - Add Well
 - Estimated \$945,000 for 445 connections = \$2,123.60 per connection
 - Total of approximately \$121,44.94

IDEQ Process – Approvals for Projects

- Greenferry Bypass Project has been approved
- Greenferry Terraces Project
 - Submit Facility Plan to IDEQ
 - IDEQ will review modeling section to coordinate with Plans & Specifications review
- Well Pump Replacement Upgrade
 - Submit Test Pump Procedure
 - Conduct Test Pumping
 - Prepare Design Plans & Specifications
 - IDEQ could approve directly after “conditional approval” of Facility Plan