So How Much Water Do You Really Need? EWEB's On-Going Efforts at Developing an Emergency Water Supply System

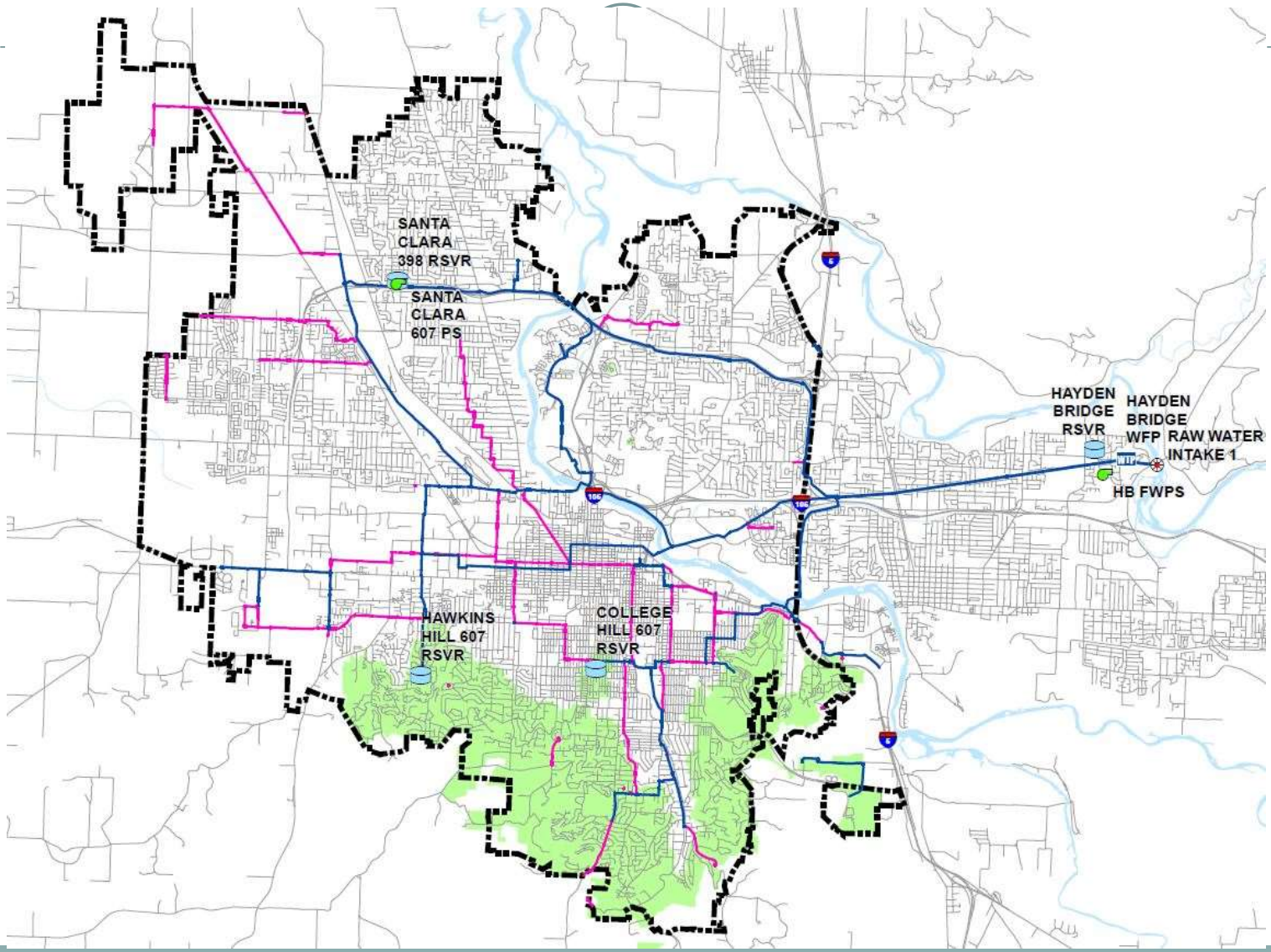
2018 PNWS-AWWA Annual Conference
Tacoma, WA

Wally McCullough, PE (OR,CA)

Presentation Outline

- EWEB's Water System
- The 2012 EWEB Emergency Water Supply Plan
- Initial Efforts
- Diversion
- New Plan
- Communications
- Questions

EWEB's Water System

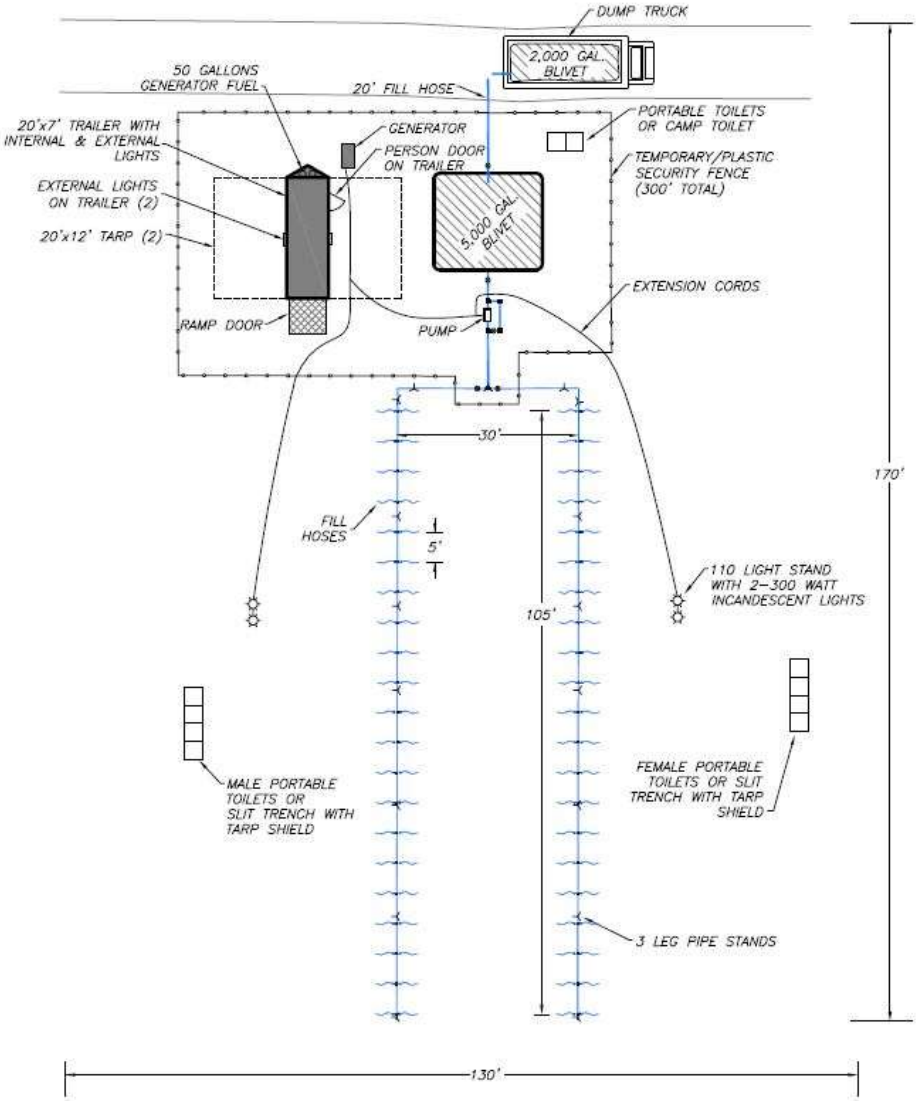


EWEB's Water System

- Founded in 1911
- Serves a population of ~185,000.
- One large base level with 5 smaller higher pressure zones
- 19 storage reservoirs, 1MG to 20MG
- 34 pump stations
- ~800 miles of distribution pipelines
  - 50% Cast iron
  - 32% Ductile
  - 4% Asbestos cement
  - 9% PVC
  - 5% Other

2012 Emergency Water Supply Plan

- Prepared Emergency Water Supply Plan in 2012
  - Goal: Distribute 2 gallons per person per day
  - Multiple distribution locations (6 in Plan)
  - Water supply from 'hardened reservoirs' and ?
  - Water would likely need to be 'trucked' to many sites.



2012 Emergency Water Supply Plan

- Logistics are Daunting
  - 300,000 gallons per day
  - How to set up sites and deliver while fixing system?
  - How to configure an efficient distribution system?
- We got started…

Potential Distribution Sites

- Criteria
  - Sufficient area
  - Adequate access
- Number of sites
  - 14 Potential Sites were identified
  - Assumption made that not all would be accessible
- MOUs
  - Developed to ensure cooperation.
  - The smaller the organization – the easier it was to secure an MOU.

Memorandum of Understanding

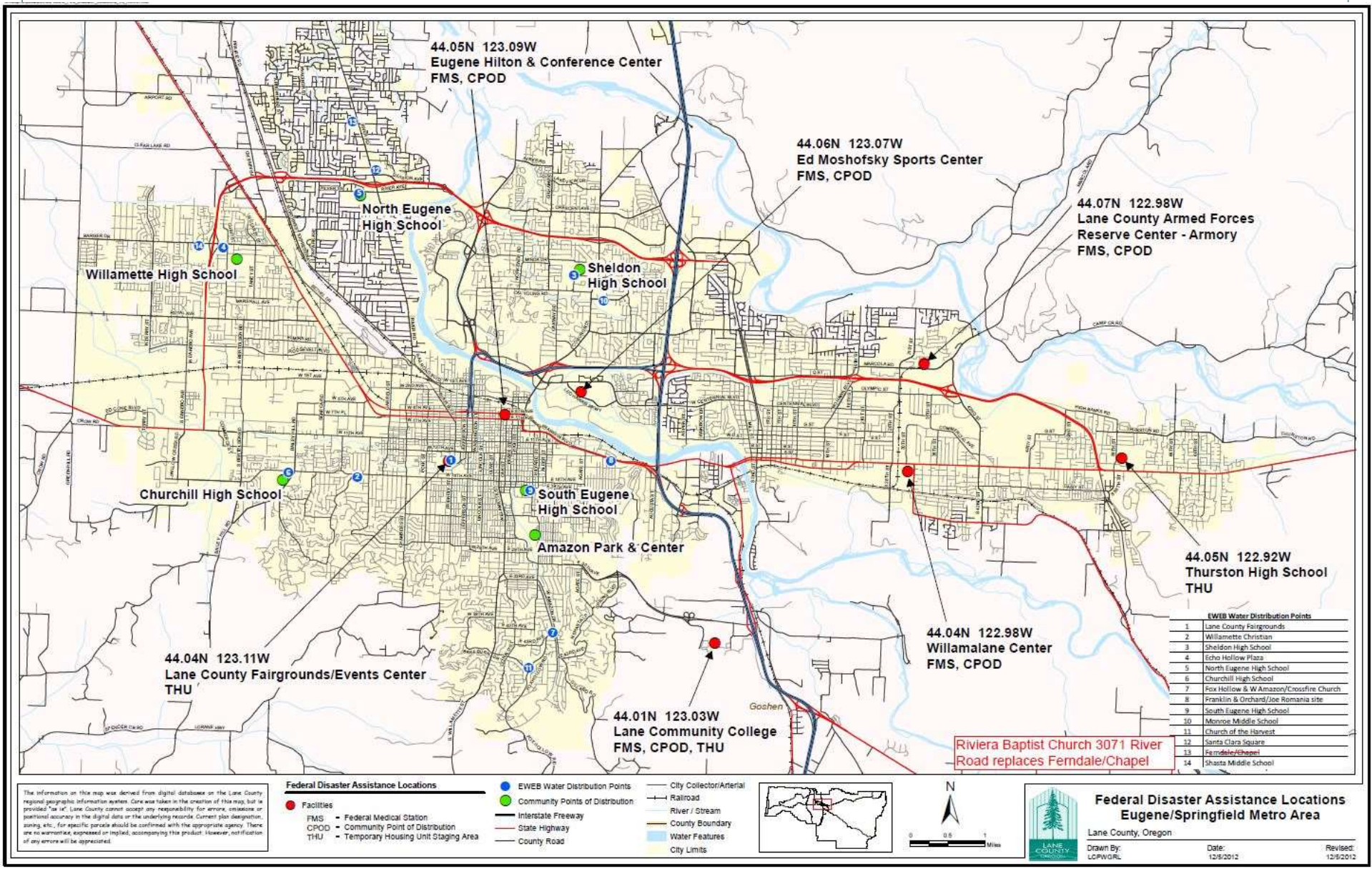
between

Eugene Water & Electric Board

and

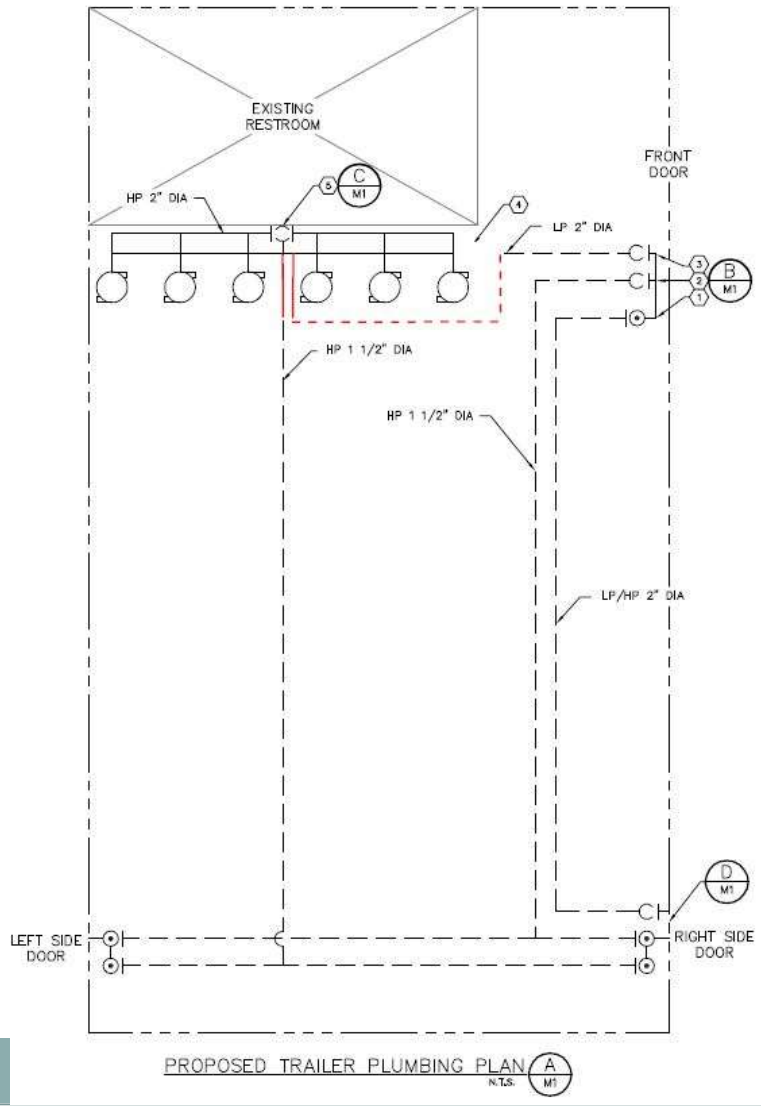
4J School District
Sheldon High School 2455 Willakenzie Rd. Eugene, OR 97401
Churchill High School 1850 Bailey Hill Rd. Eugene, OR 97405
South Eugene High School 400 E 19th Ave. Eugene, OR 97401
Monroe Middle School 2800 Bailey Ln. Eugene, OR 97401

Sites


44.05N 123.09W
Eugene Hilton & Conference Center
FMS, CPOD
44.06N 123.07W
Ed Moshofsky Sports Center
FMS, CPOD
44.07N 122.98W
Lane County Armed Forces
Reserve Center - Armory
FMS, CPOD
North Eugene
High School
Willamette High School
Sheldon
High School
Churchill High School
South Eugene
High School
Amazon Park & Center
44.05N 122.92W
Thurston High School
THU
44.04N 122.98W
Willamalane Center
FMS, CPOD
44.04N 123.11W
Lane County Fairgrounds/Events Center
THU
44.01N 123.03W
Lane Community College
FMS, CPOD, THU
Goshen
Riviera Baptist Church 3071 River Road replaces Ferndale/Chapel
EWEB Water Distribution Points
1 Lane County Fairgrounds
2 Willamette Christian
3 Sheldon High School
4 Echo Hollow Plaza
5 North Eugene High School
6 Churchill High School
7 Fox Hollow & W Amazon/Crossfire Church
8 Franklin & Orchard/Joe Romania site
9 South Eugene High School
10 Monroe Middle School
11 Church of the Harvest
12 Santa Clara Square
13 Ferndale/Chapel
14 Shasta Middle School
The information on this map was derived from digital databases on the Lane County regional geographic information system. Care was taken in the creation of this map, but is provided "as is". Lane County cannot accept any responsibility for errors, omissions or positional accuracy in the digital data or the underlying records. Current plan designation, zoning, etc., for specific parcels should be confirmed with the appropriate agency. There are no warranties, expressed or implied, accompanying this product. However, notification of any errors will be appreciated.
Federal Disaster Assistance Locations
Facilities
FMS = Federal Medical Station
CPOD = Community Point of Distribution
THU = Temporary Housing Unit Staging Area
EWEB Water Distribution Points
Community Points of Distribution
Interstate Freeway
State Highway
County Road
City Collector/Arterial
Railroad
River / Stream
County Boundary
Water Features
City Limits
N
0 0.5 1 Miles
Federal Disaster Assistance Locations
Eugene/Springfield Metro Area
Lane County, Oregon
Drawn By: LCPWGRL
Date: 12/5/2012
Revised: 12/5/2012

Water Distribution Trailers

- Design Criteria:
  - Towable with a full size pickup
  - Self contained with all distribution piping, signage, generator, etc.
  - Able to provide water from a pressurized source or an ‘open’ tank or container i.e. Equipped with pumps.
  - With an adequate number of spigots.
  - Provided with a bathroom



Water Distribution Trailers

- First trailer geared toward public education/outreach.
- Water can be provided from within the trailer.

Water Distribution Trailers

- First trailer geared toward public education/outreach.
- Water can be provided from within the trailer.

Water Distribution Trailers

- Second and third trailers provided with exterior distribution connections only and have greater pumping capacity.
- ~$40k each

Water Distribution Trailers

- Pumps – Grundfos MQ shallow well pumps
- Can be bypassed.

Hauling Water

- Biggest Issue to Overcome
- Blivets and Hard Side Containers

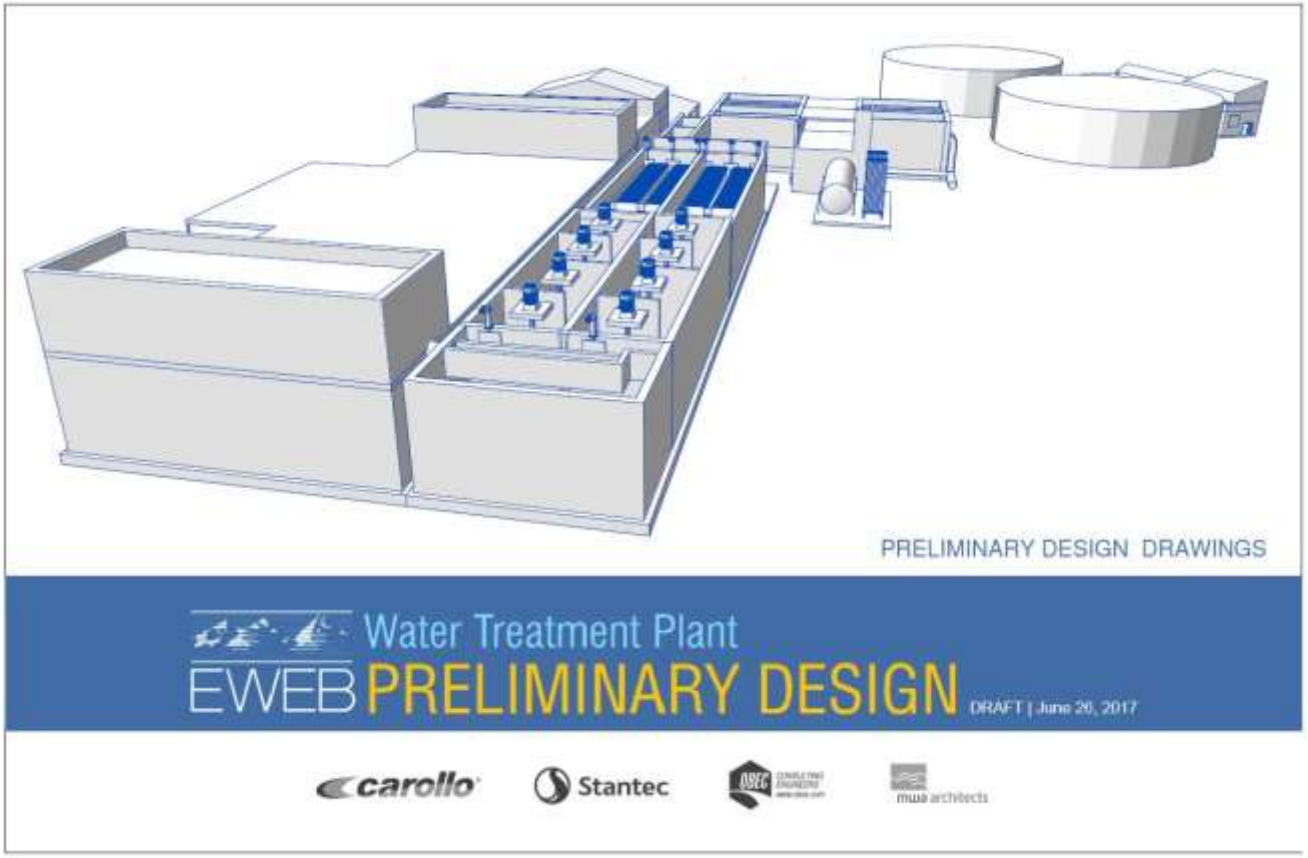
Practice and Events

Practice and Events

EUGENE OR
DISASTER
RELIEF
TRIALS
2014

Diversion

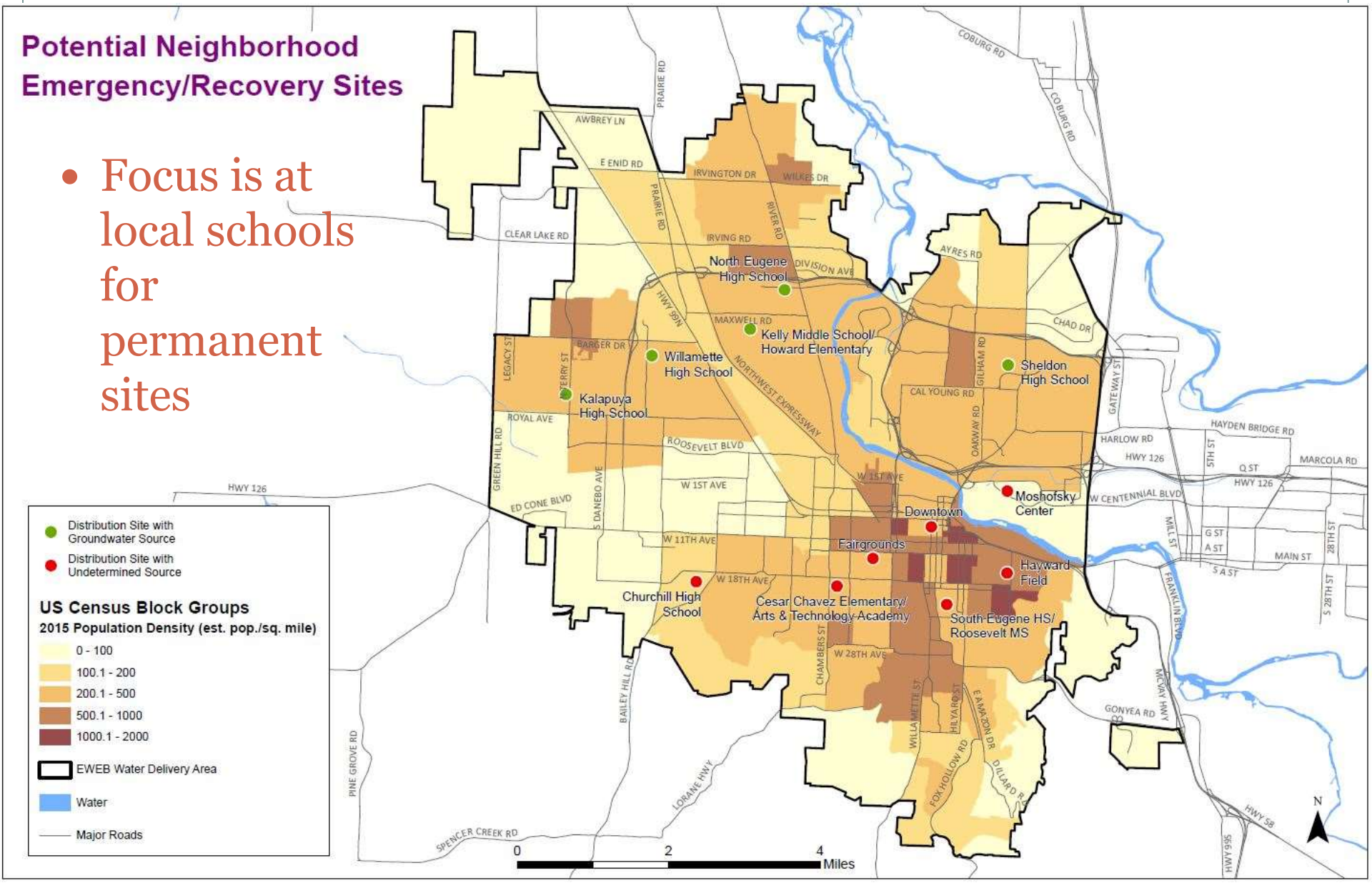
- Focused on our Second Source Project
  - 10-15 MGD to meet minimum demands
  - Resources diverted to project
  - Work stalled on emergency supply project



New Focus

- After Second Source Project was deferred.
- Revised Emergency Water Supply Program
  - Establishment of permanent sites with:
    - Established sources of water – wells, other?
    - Microgrid electrical backup
  - Goal is 5 sites in 5 years
  - Supplemented by mobile distribution trailers/temporary sites/portable water treatment trailers

New Distribution Sites



Water Required at Each Site

- Based on 2 gallons per person per day and population served
- Do not want to provide too much capacity – just takes more power

	GPM (24 Hr)	GPM (10 Hr)
Sheldon High School	40	100
North Eugene High School	30	60
Kelly Middle School/Howard Elementary	20	50
Willamette High School	20	50
Kalapuya High School	30	60
Hayward Field	20	50
South Eugene High School/Roosevelt Middle School	30	60
Cesar Chavez Elementary/ATA	20	40
Churchill High School	20	40
Fairgrounds	20	40
Downtown (Hilton/Conference Center)	20	40
Moshofsky Center	20	50

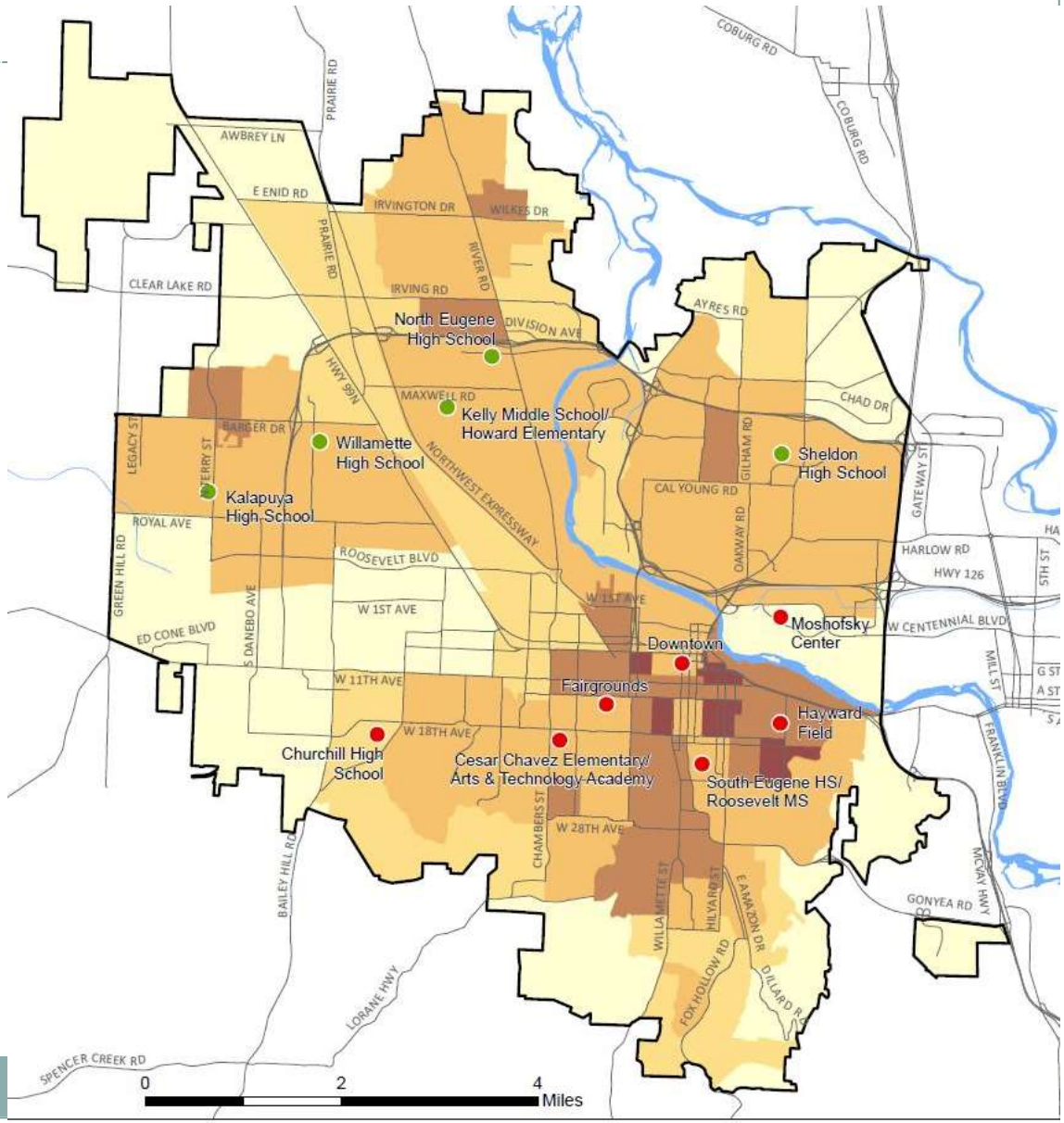
Distribution Sites

- Each permanent site to have:
  - A source of supply – well with back-up power?
  - Stored Water Distribution Equipment
- First site to be established this summer

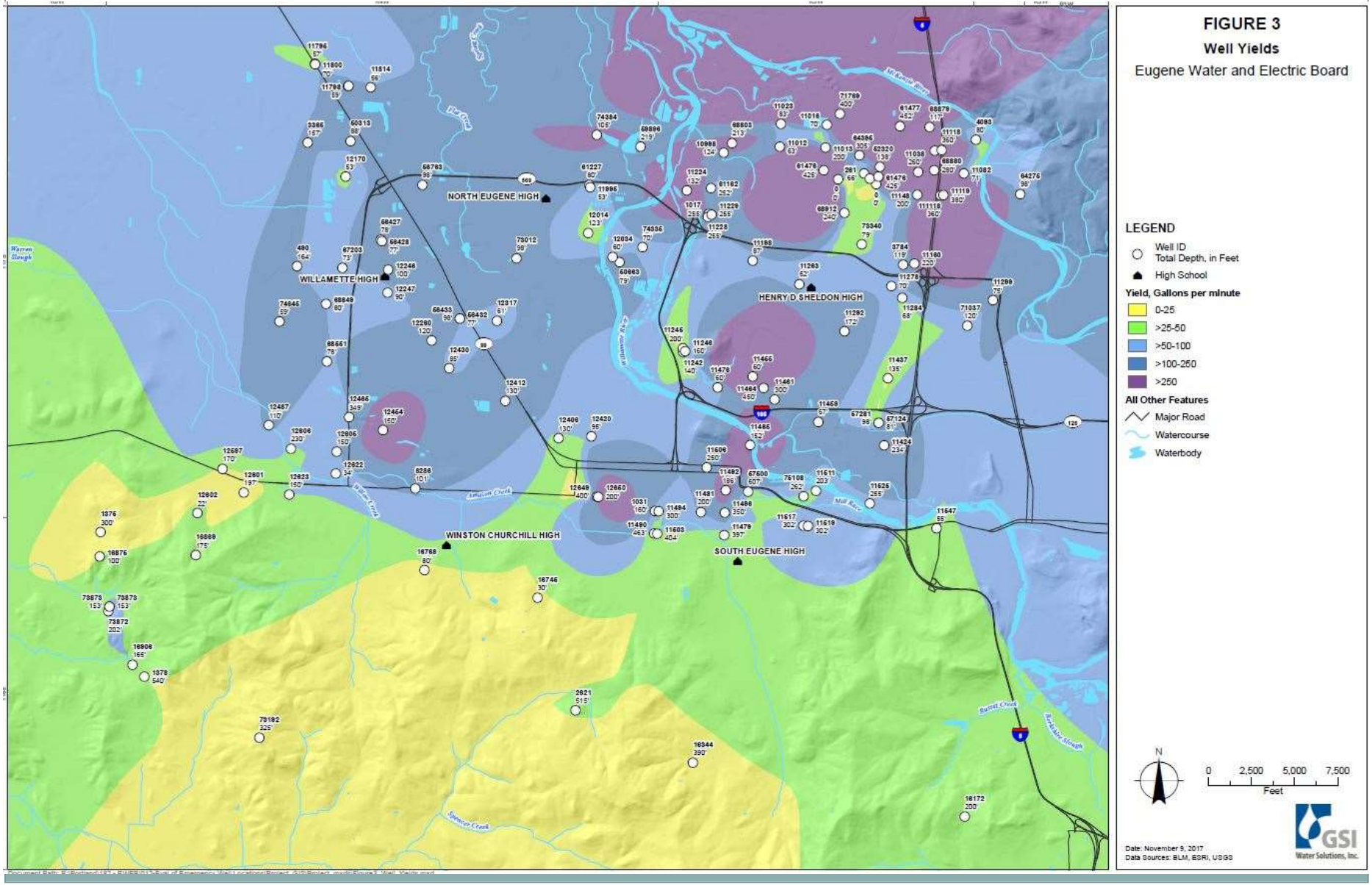
Groundwater Issues

1) Capacity

- Limited groundwater in high population density areas



Groundwater Issues



Groundwater Issues

2) Water Quality

- Criteria for no treatment:
  - Not under the influence of surface water
  - Meets drinking water requirements for:
    - Coliform bacteria
    - Nitrate
    - Arsenic
- Limited wells tested to date meet this criteria.
- Goal is to have no treatment to allow non-EWEB staff operate system

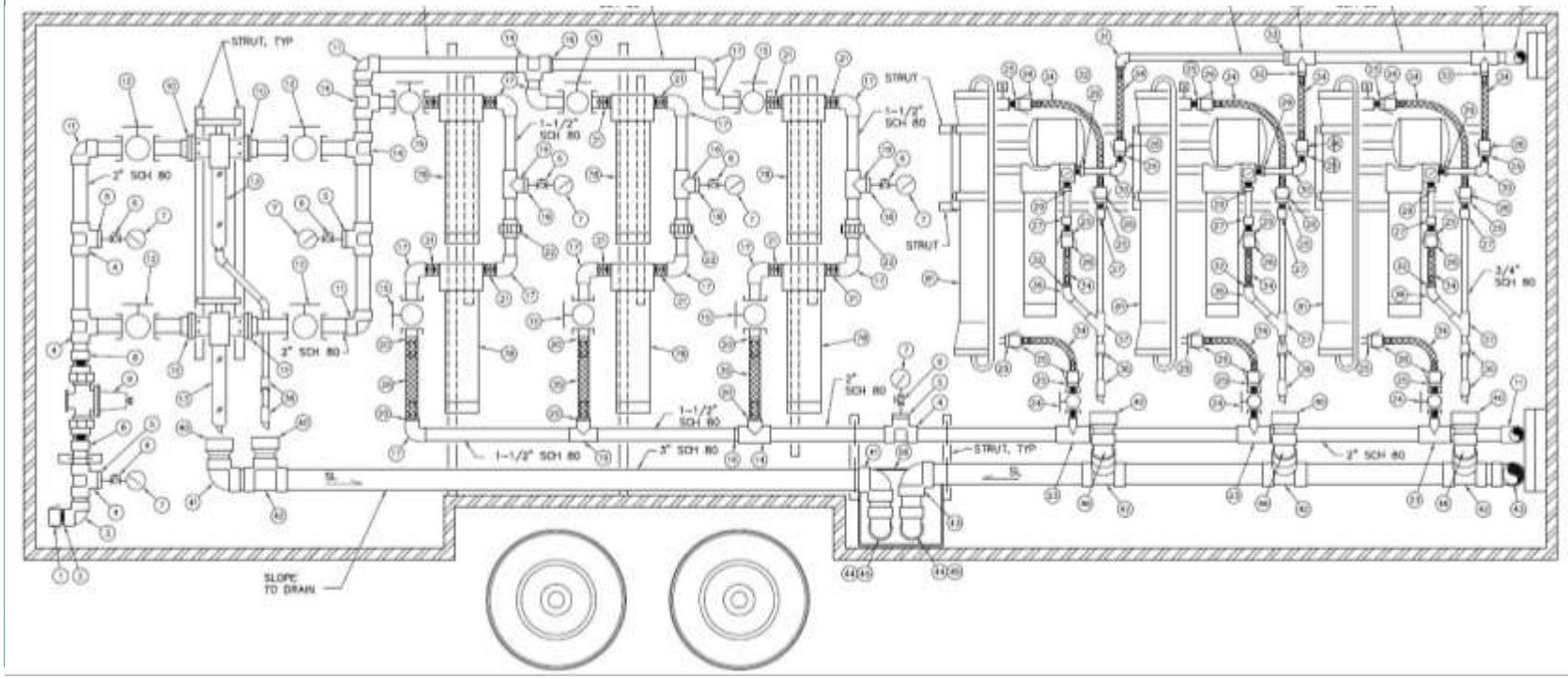
Alternatives to Groundwater

- Surface Water
  - Will require treatment
  - Commissioning one portable treatment trailer
  - Looking at options for a small permanent plant
- Storage – Hardened Reservoirs
  - Part of the plan but will take years to implement due to cost

Surface Water

- Portable Treatment Trailer
  - 60 GPM
  - ~$60k

1. Strainer – 250 micron
2. Cartridge filter – 50 micron
3. Cartridge filter – 50-5 micron
4. UF membrane filter and carbon cartridge, self cleaning - .015 micron
5. Chlorine – liquid
6. Rotameter



Surface Water

Surface Water

- Portable Treatment Trailer Testing
  - Potable water then river water
  - Replacing UF membrane filters
  - Cartridge Filters and UV for flexibility and to allow for “dry storage”

Surface Water

- Permanent Treatment Plant
  - Currently exploring options
  - Potentially combined with a ‘micro-distribution” system to provide water to critical areas and those with high population density

Communications – Public Outreach

- Integral part of program from beginning
- Started with emergency preparedness, shifted to support for second source, and now to new program
- Generally successful but at times difficult to get the facts straight – getting water from your tap is different than walking down the street with a jug of water

"..but we are developing an emergency water supply with wells so it is all going to be ok"

So How Much Water Do You Really Need? EWEB's On-Going Efforts at Developing an Emergency Water Supply System

QUESTIONS?