



Clark Public Utilities

Southlake Water Treatment Plant
Carol J. Curtis Water Treatment Plant



Southlake Plant Objectives

- Meet Water Demand Needs for CPU, Battle Ground and Ridgefield
- Plan for 50-Year Period
- Provide Service at Reasonable Cost to Rate Payers - Reliable, Uninterruptible
- Meet Requirements of WRIA 27/28 Planning Policies

Clark Public Utilities

- Overview of Presentation

1. Clark County Water Supply Picture

2. Clark Public Utilities Supply

3. Future Supply Alternatives

3. Plant Description

3. Schedule & Budget



Projected County-Wide Population Growth for Planning Horizon

Year	Population
2000	345,200
2020	544,800
2050	790,500



Average Day Municipal Demand (mgd)

Year	CPU, BG & Ridgefield	Vancouver	County Wide*
2000	10.8	25.1	40.7
2020	21.1	33.6	64.5
2050	39.7	52.2	107.3



Current Annual Water Rights (Primary)

CPU, BG & Ridgefield	14.4 mgd	16,088 af/yr
Vancouver	30.9 mgd	34,615 af/yr
County-Wide Municipal	54.5 mgd	61,068 af/yr

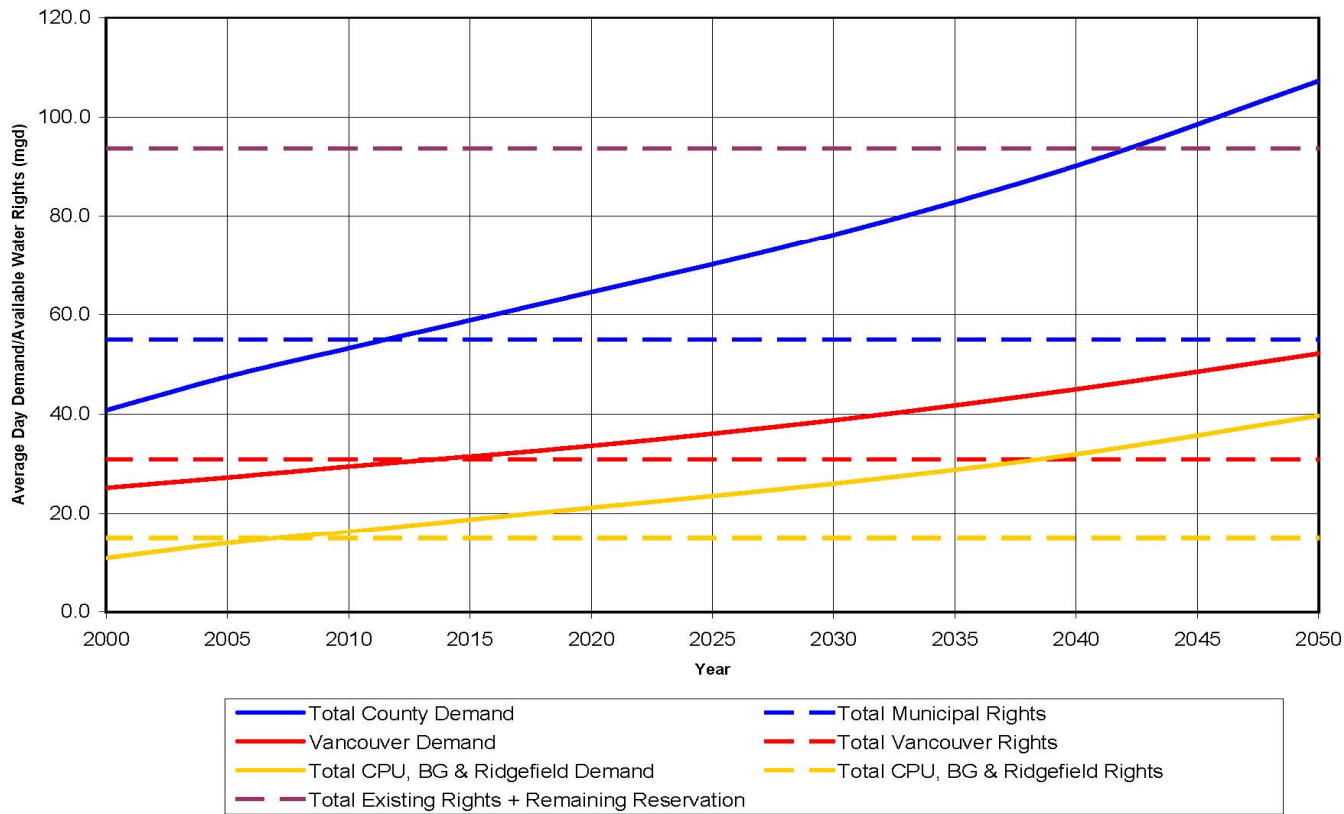


Clark County Water Right Reservation

- Reserves Groundwater within Clark County for Future Public Use (WAC 173-592)
- Future Municipal Rights have Priority Date of August 13, 1986
- WAC 173-152-90: Policy of Department to protect quality; discourage contamination or impair beneficial use
- Reservation includes 97,000 gpm and 65,300 af/yr
- Current Allocations include 28,735 gpm and 21,887 af/yr
- Remaining Reserves include 68,265 gpm and 43,413 af/yr (38.7 mgd)

Projected Average Day Water Demand versus Available Water Rights

Projected Average Day Water Demand versus Available Water Rights



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Principal Supply Aquifers

- Recent Alluvial Aquifer (RAA)
- Pleistocene Alluvial Aquifer (PAA)
- Upper Troutdale Aquifer (UTA)
- Lower Troutdale Aquifer (LTA)
- Sand and Gravel Aquifer (SGA)

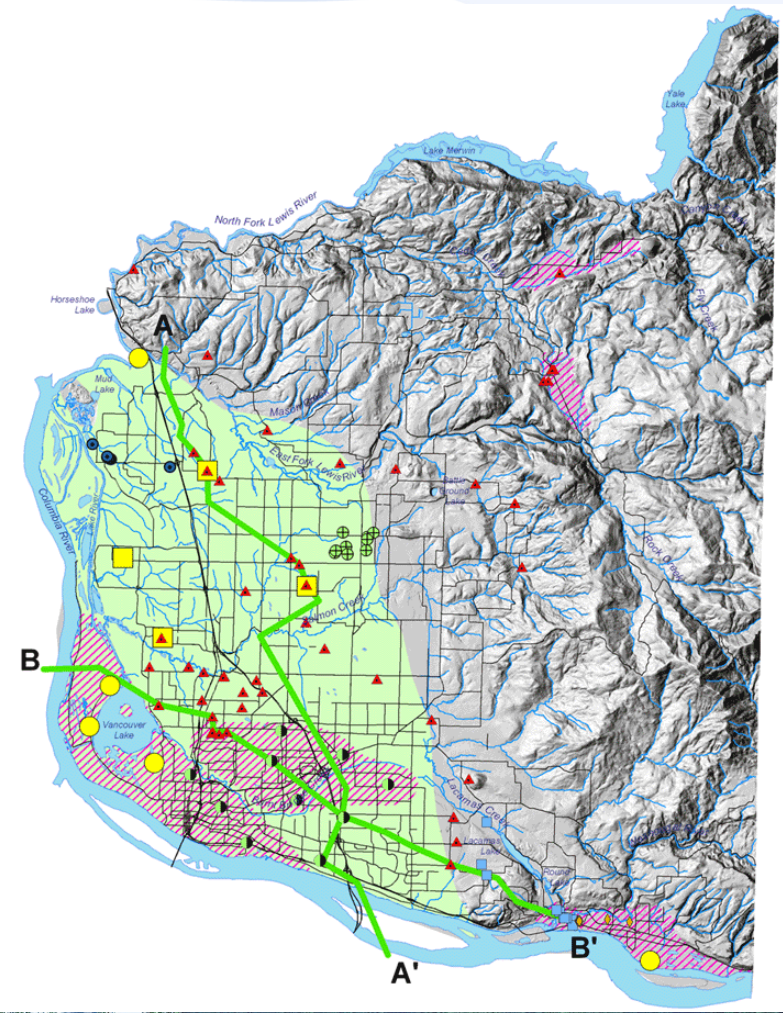
Aquifer Occurrence

Existing Public Supply Wells

- ⊕ Battleground Wells
- Camas Wells
- ▲ Clark Public Utilities Wells
- Port of Ridgefield Wells
- Vancouver Wells
- ◆ Washougal Wells

Potential Water Supply Locations

- Lowland Wellfields
- Upland Wellfields
- ↗ Cross Section Alignments
- ☪ Water Bodies
- ~ Streams
- Roads
- Deep Aquifers
- ▨ Shallow Aquifers



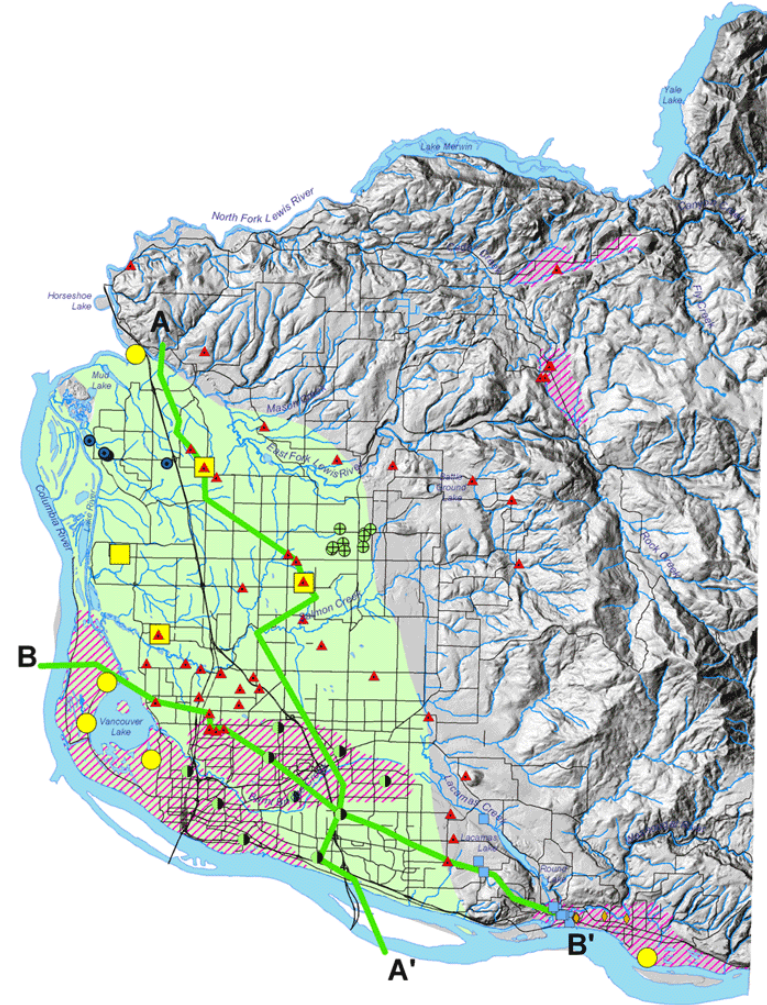
Distribution of Existing Municipal Supply Sources

Existing Public Supply Wells

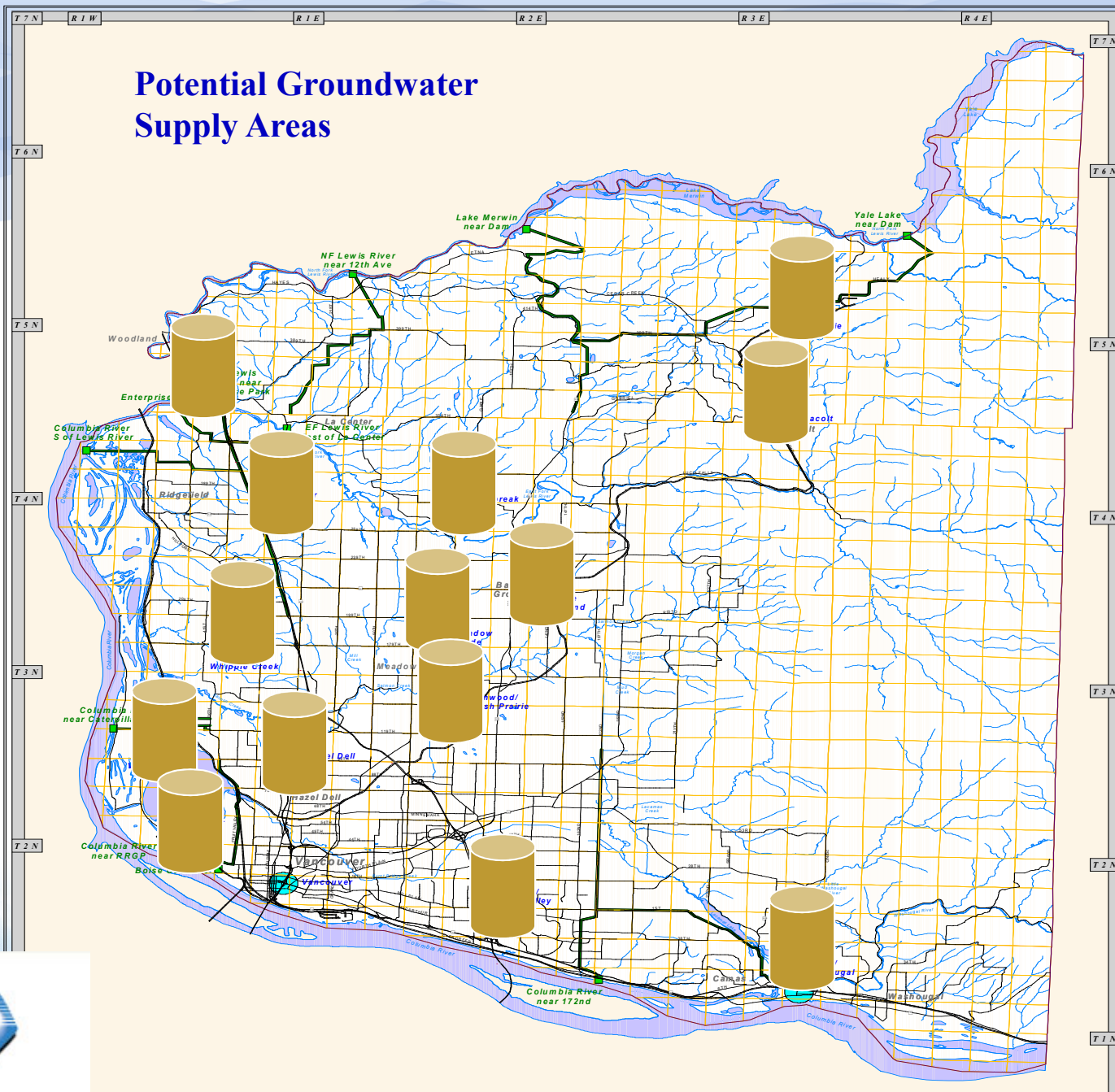
- ⊕ Battleground Wells
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Potential Water Supply Locations

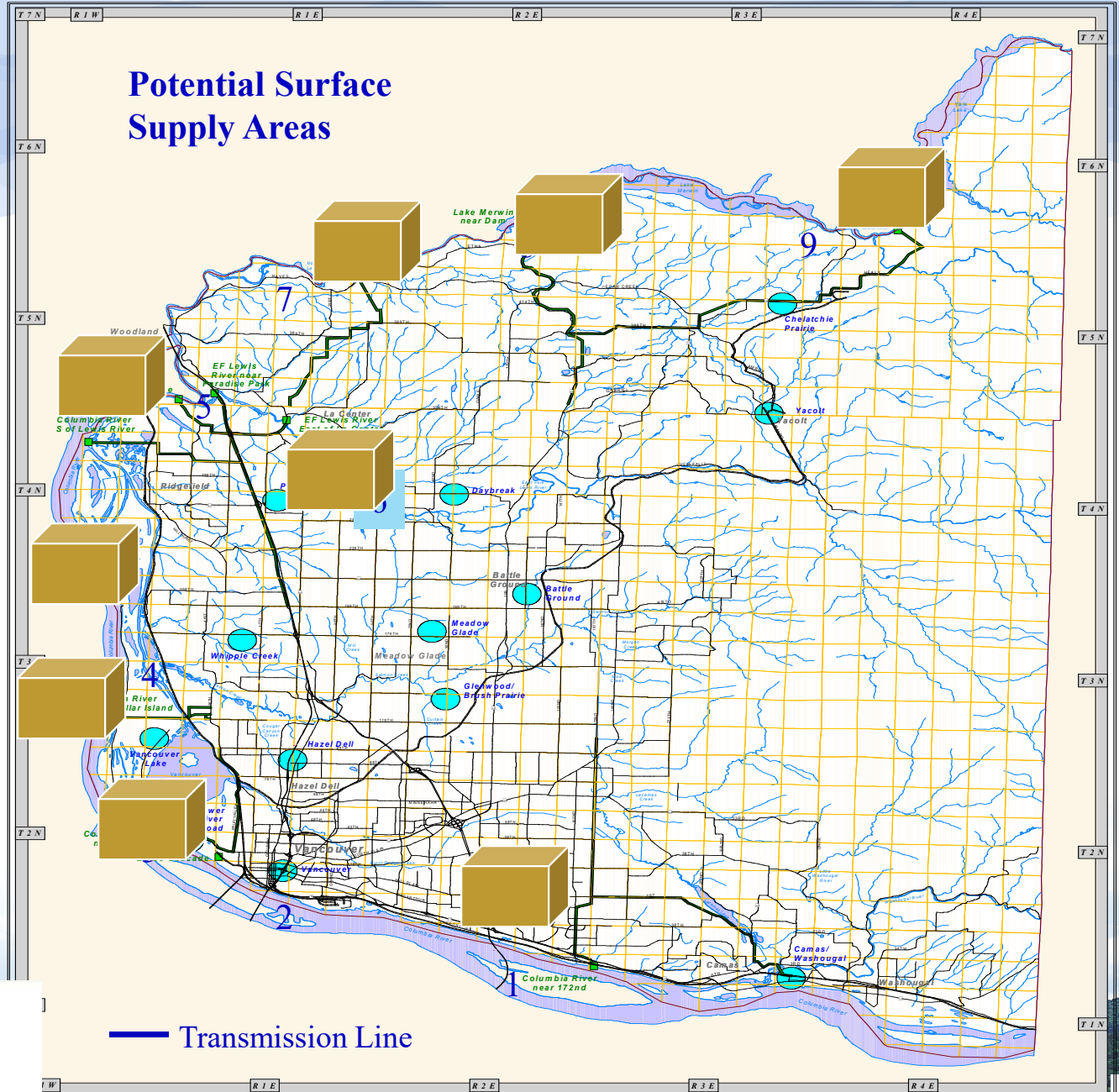
- Lowland Wellfields
- Upland Wellfields
- ↗ Cross Section Alignments
- ☪ Water Bodies
- ~ Streams
- Roads
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Potential Groundwater Supply Areas



Potential Surface Supply Areas



WRIA 27/28 Watershed Plan Policies

- New Water Supplies should Avoid or Minimize Impacts to Stream Flow
- Regional Planning for Water Supply is Strongly Encouraged
- Impacts to Upland Streams must be Mitigated
- Focus Future Development in Tidally Influenced Lowland Areas and Deep Aquifers

Future Supply Considerations

- ESA Issues Limit Further Use of Shallow Upland Aquifers
- Deep Aquifer are Recharge Limited
- Future Demand must be met through Use of Shallow Lowland Supply Sources

Potential Future Supply Options/Areas

- SGA – Uplands (North of Salmon Creek)
- SGA - Vancouver Lake Lowlands
- PAA – Lewis River Lowlands
- PAA – Steigerwald Wildlife Refuge
- PAA – Westside Vancouver Lake
- PAA – South Lake Area

SGA – Uplands (North of Salmon Creek)

- Potential for Impacts to the East Fork Lewis River (mitigation required)
- Fe/Mn Treatment Costs
- Total Additional Yield likely < 5 mgd

SGA - Vancouver Lake Lowlands

- Fe/Mn Treatment Costs
- Total Additional Yield likely < 10 mgd
- Yield and WQ need to be confirmed through Testing
- Avoids Impacts to Port Cleanup

PAA – Lewis River Lowlands

- Yield Potential Unknown (hydrogeologic setting suggests < 10 mgd)
- Fe/Mn Treatment Likely Required
- Located within Tidally Influenced Area
- Convenient to North County Area
- Transmission Infrastructure Costs are Higher

PAA – East County

- Yield Potential Unknown (hydrogeologic setting would suggest high yield potential, > 25 mgd?)
- Water Quality Unknown (hydrogeologic setting would suggest elevated Fe, Mn)
- Infrastructure Costs Limit Use as Regional Source (lengthy transmission pipeline required to reach CPU service area)
- May be suitable to meet long-term needs of Camas & Washougal

PAA – Westside Vancouver Lake

- Productive Supply Area (> 50 mgd)
- Natural Water Quality Exhibits High Mineral Content (Fe, Mn, As, Hardness)
- Higher Infrastructure Costs for Treatment and Transmission
- Higher O&M Cost
- Sensitive Area designation Complicates Development
- Plume Containment will be required for Development of Large Water Supplies

PAA – South Lake Area

- Most Productive Supply Area in Clark County (> 50 mgd)
- Preferred Site considering WQ
 - Natural WQ Exhibits Low Mineral Content
 - WQ Meets SDWA req'ts untreated
 - WQ safeguard via VOC treatment
- Preferred Site considering Environmental Reg's
- Preferred Site considering Cost
 - Proximate to demand area
- Plume Containment is the Issue Impacting Development of New Water Supply

Supply Options Cost Summary

Option Number	Source	Capacity MGD	Total Capital Costs	Annualized Capital Cost	Annual O&M	Cost/MG	Cost/CCF	50 year cost
Groundwater:								
1	SGA-Uplands	5	\$6,979,500	\$ 633,434	\$ 90,180	\$ 793	\$ 0.59	\$ 11,488,500
2	SGA-Van. Lake Lowlands	10	\$12,340,350	\$ 1,119,966	\$ 180,360	\$ 713	\$ 0.53	\$ 21,358,350
3	PAA-Lewis River Lowlands	10	\$15,160,500	\$ 1,375,912	\$ 180,360	\$ 853	\$ 0.64	\$ 24,178,500
4	PAA-Steigerwald	25	\$54,189,000	\$ 4,917,998	\$ 450,900	\$ 1,177	\$ 0.88	\$ 76,734,000
Subtotals for Options 1 - 4		50						\$ 133,759,350
5	PAA-Westside Van. Lake	50	\$72,994,500	\$ 6,624,718	\$ 1,594,350	\$ 901	\$ 0.67	\$ 152,712,000
6	PAA-South Lake	50	\$35,629,875	\$ 3,233,639	\$ 928,800	\$ 456	\$ 0.34	\$ 82,069,875
Surface Water:								
7	Columbia River Near 172nd	50	\$116,286,300	\$ 10,553,725	\$ 3,277,260	\$ 1,516	\$ 1.13	\$ 280,149,300
8	Columbia River Near RRGP	50	\$108,009,720	\$ 9,802,573	\$ 3,277,260	\$ 1,433	\$ 1.07	\$ 271,872,720
9	Columbia River Near Caterpillar Island	50	\$101,166,435	\$ 9,181,501	\$ 3,277,260	\$ 1,365	\$ 1.02	\$ 265,029,435
10	Columbia River S. of Lewis River Confluence	50	\$106,276,320	\$ 9,645,256	\$ 3,277,260	\$ 1,416	\$ 1.06	\$ 270,139,320
11	Lower Lewis River	50	\$98,529,075	\$ 8,942,144	\$ 3,277,260	\$ 1,339	\$ 1.00	\$ 262,392,075
12	Lake Meridian near Dam	50	\$69,458,175	\$ 6,303,774	\$ 4,211,218	\$ 1,152	\$ 0.86	\$ 280,019,088
13	Yale Reservoir near Dam	50	\$80,524,598	\$ 7,308,122	\$ 4,211,218	\$ 1,262	\$ 0.94	\$ 291,085,510

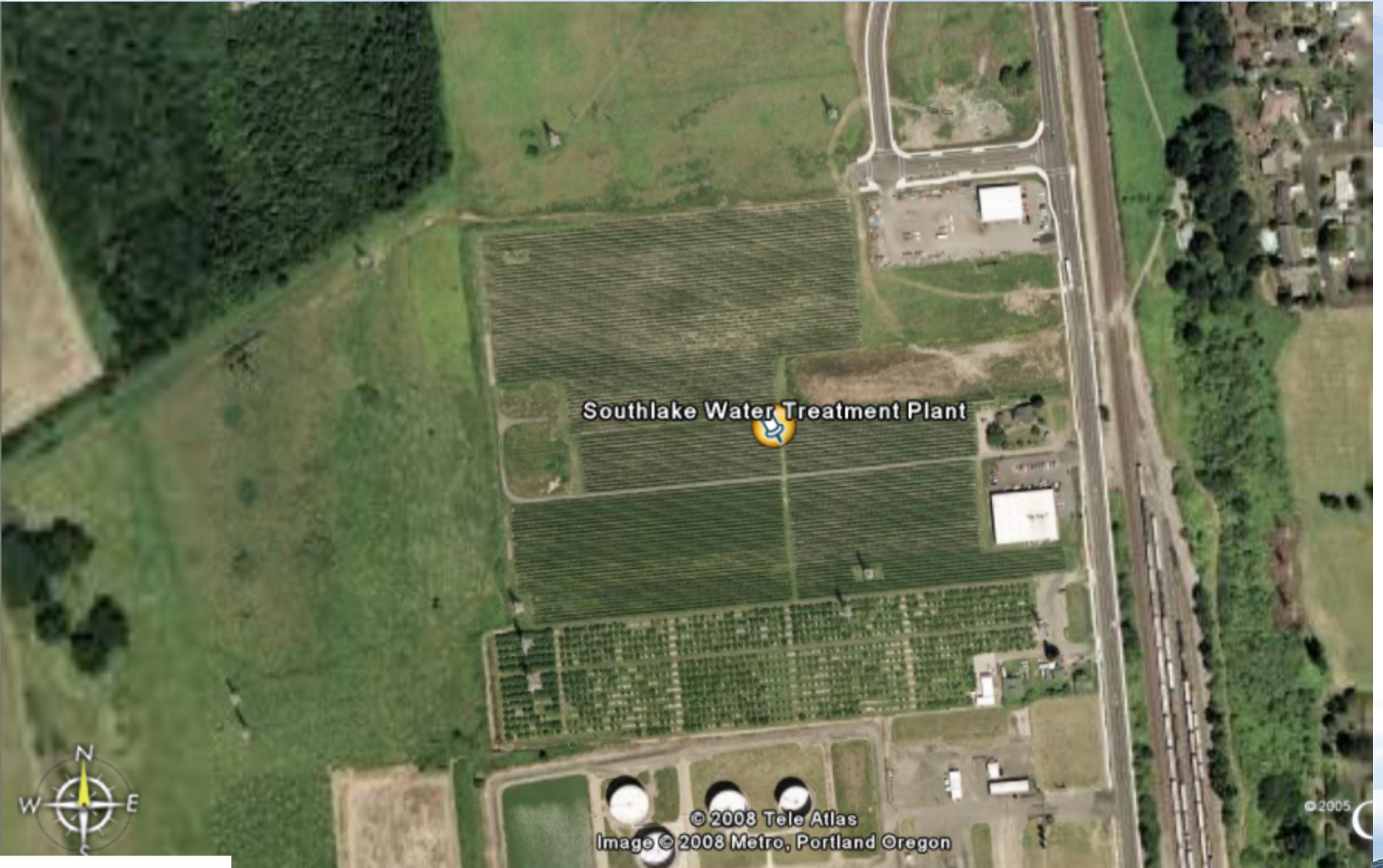
preliminary and subject to further refinements



CPU Soutlake Water Treatment Plant – Phase 1 – SGA Development

- Designed with 10 MGD Capacity from SGA
 - 4 Wells
 - Iron and Manganese Removal
 - On-site Chlorine Generation
- Site Capacity 50 MGD with additional Supply from PAA
 - 8 wells
 - Disinfection only
 - May need corrosion control



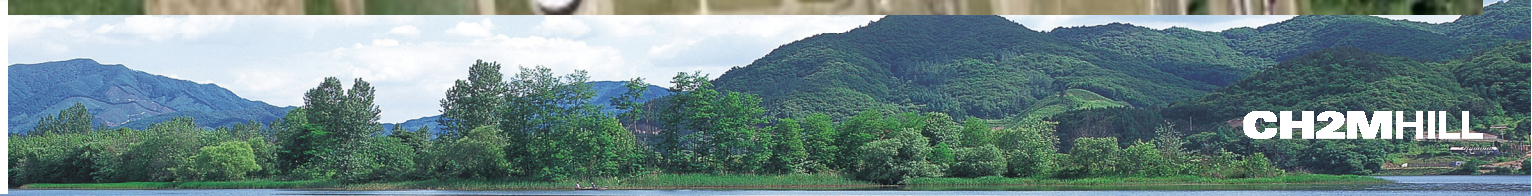


Southlake Water Treatment Plant



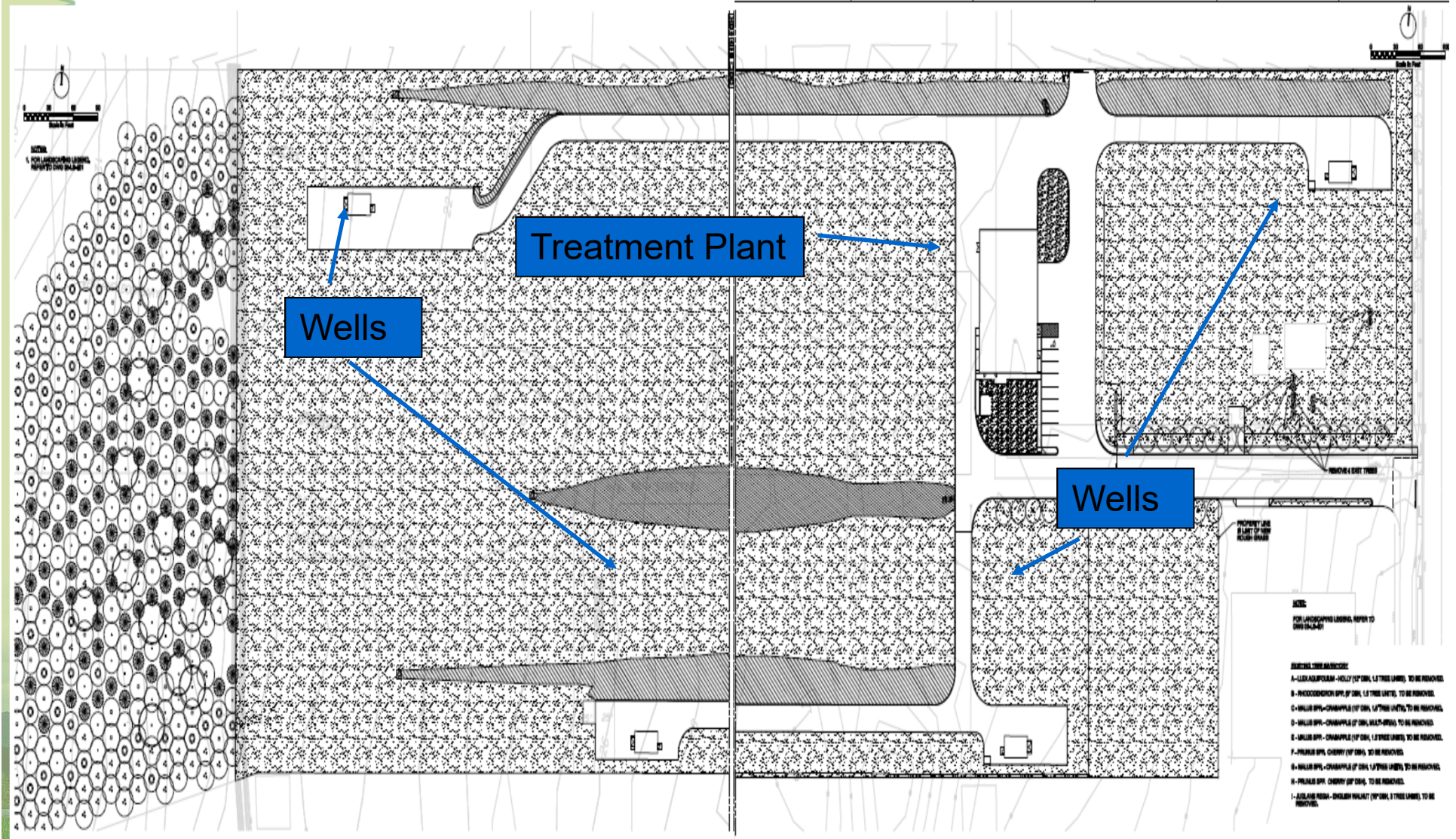
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Image © 2008 Metro, Portland Oregon

© 2005



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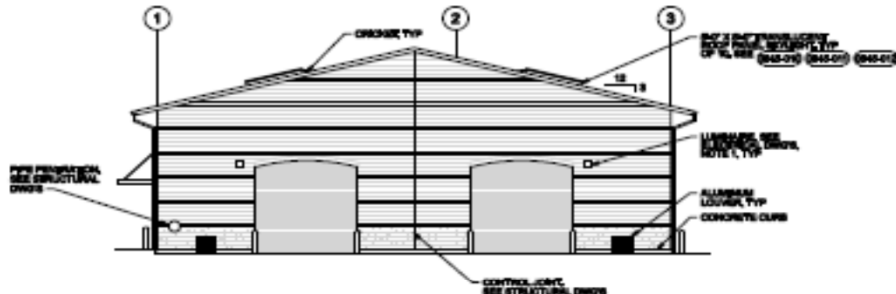
Site Plan



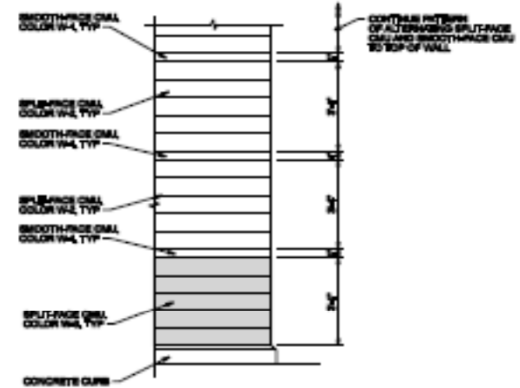
Treatment Plant



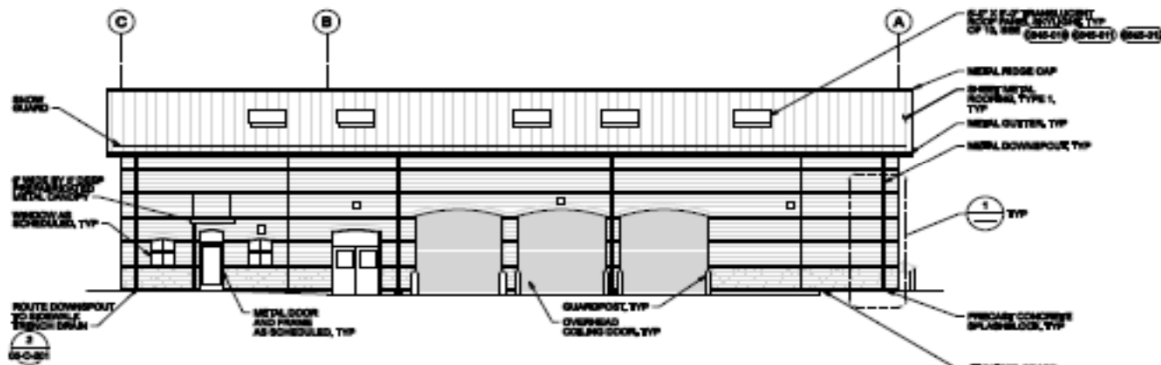
Treatment Plant Elevations



1 NORTH ELEVATION
1/8"=1'-0"



1 ENLARGED ELEVATION
1/8"=1'-0"



2 EAST ELEVATION
1/8"=1'-0"

NOTES
1. FINISH BRICK OR PATTERN BRICK FINISH AND SET FLASHING UP TO BRICK (S22-03)

PRELIMINARY

CLIENT: PUBLIC UTILITY AGENCY
PROJECT: SOUTH LANE WASTEWATER TREATMENT PLANT
LOCATION: WACONIA, MINNESOTA

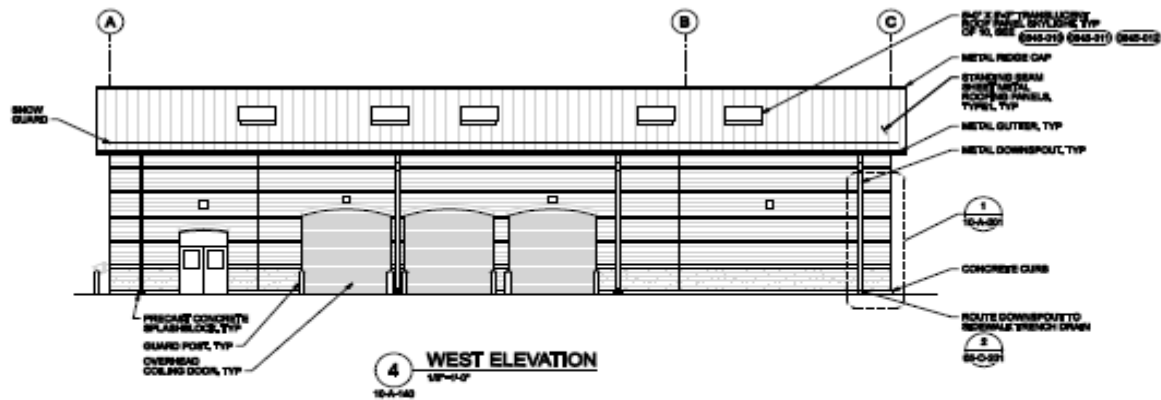
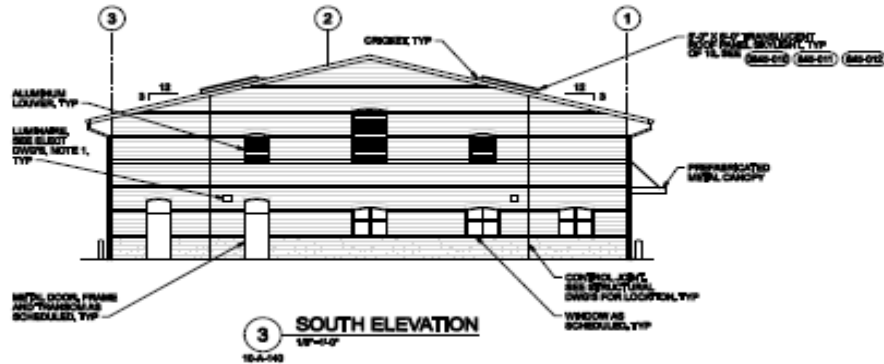
CH2MHILL

WASTEWATER TREATMENT PLANT
ARCHITECTURAL
BUILDING ELEVATIONS

VERIFY SCALE
DATE: 10/10/2009
DRAWN: JULY 2009
CHECKED: [REDACTED]
DATE: [REDACTED]
DATE: 12-4-2011
DESIGNER: [REDACTED]

FILENAME: s:\10102_01\10102.dwg PLOTDATE: 11/10/09 PLOTTIME: 10:07:46

Treatment Plant Elevations



NOTE
1. AT EXTERIOR LIMBS PROVIDE 1/2" X 1/2" AREA OF SMOOTH-FINISH CMAL

PRELIMINARY

DATE: JULY 2024
 PROJ: 202410
 DWG: 10-A-232
 SHEET: 03

CH2MHILL

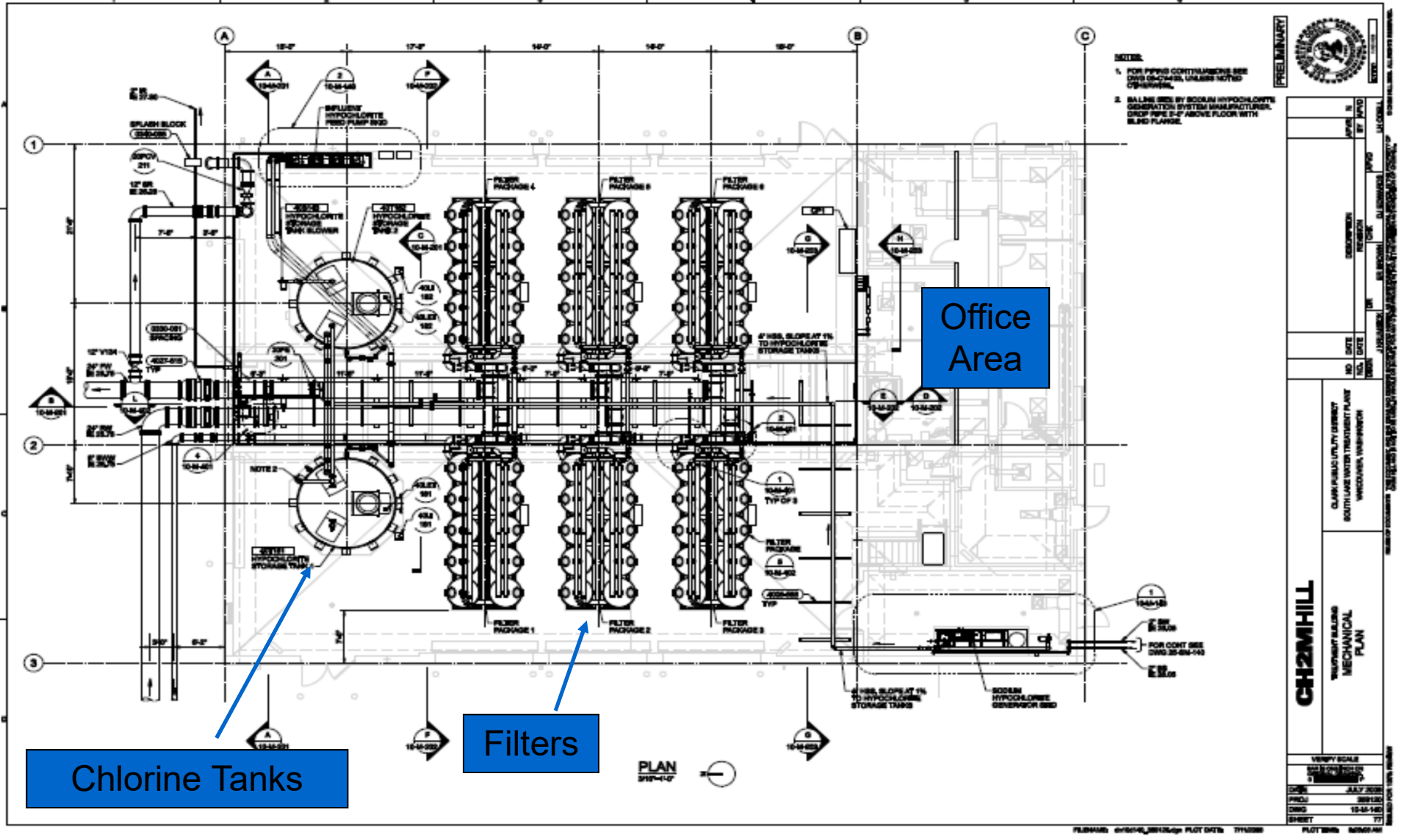
CLIENT: CLARK COUNTY WATER TREATMENT PLANT
 SOUTH LAKE WATER TREATMENT PLANT
 WINNEVOCA, ILLINOIS

ARCHITECTURAL
 BUILDING ELEVATIONS

VERIFY SCALE
 SEE FIRST SHEET

FILENAME: ch2mhill_202410.dwg PLOT DATE: 7/16/2024 PLOT TIME: 7:02:50 AM

Plant Layout



Chlorine Tanks

Filters

Office Area

FREE QUOTATION

CH2MHILL

CLARK PUBLIC UTILITY SERVICE
SOUTH LAKE WATER TREATMENT PLANT
WACO, TEXAS 76798

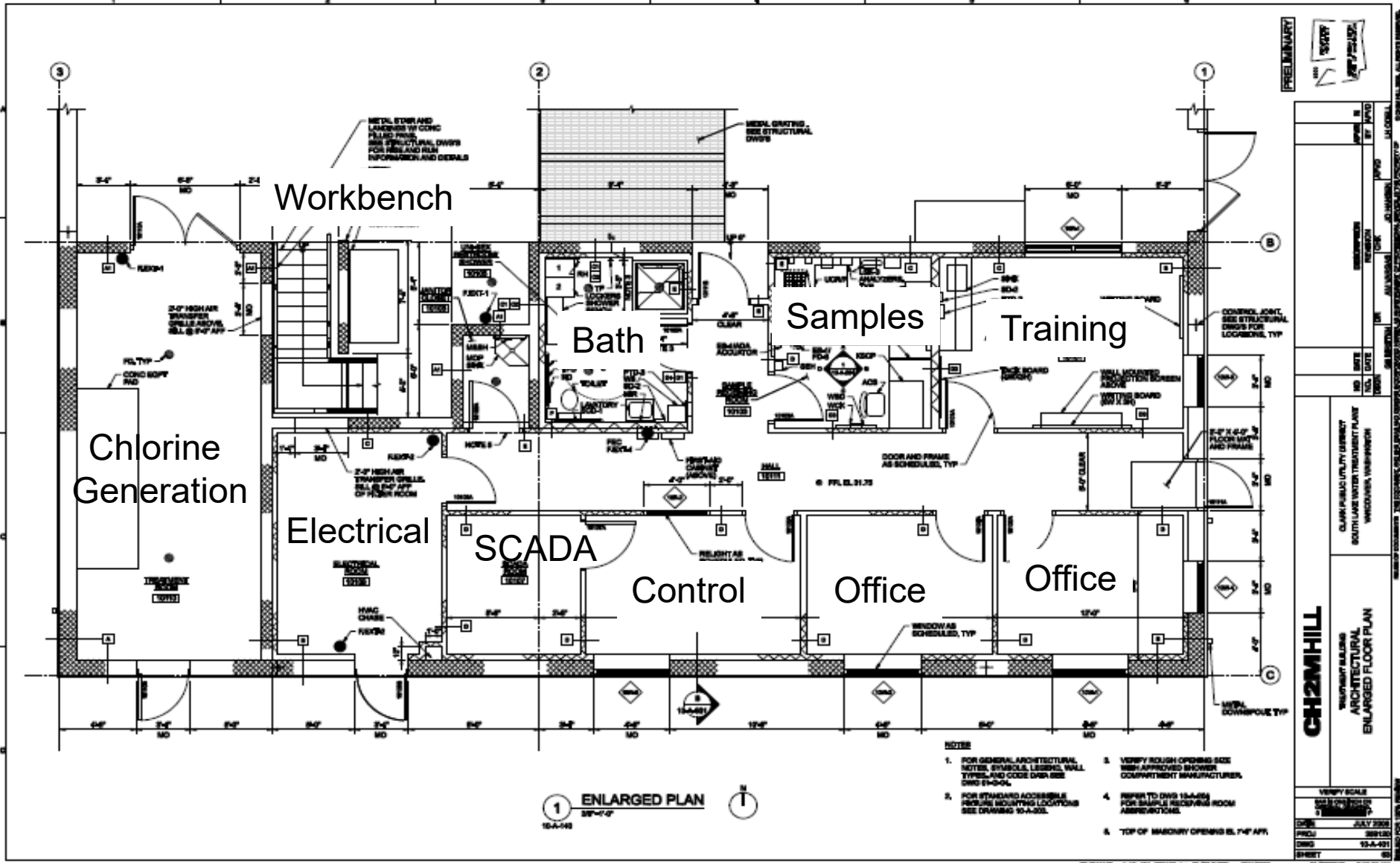
MECHANICAL PLAN

DATE: JULY 2008
PROJECT: 20-54-100
DRAWING: 20-54-100
SHEET: 17

SCALE: AS SHOWN

PROJECT NO: 20-54-100

Office Area Layout



CH2MHILL

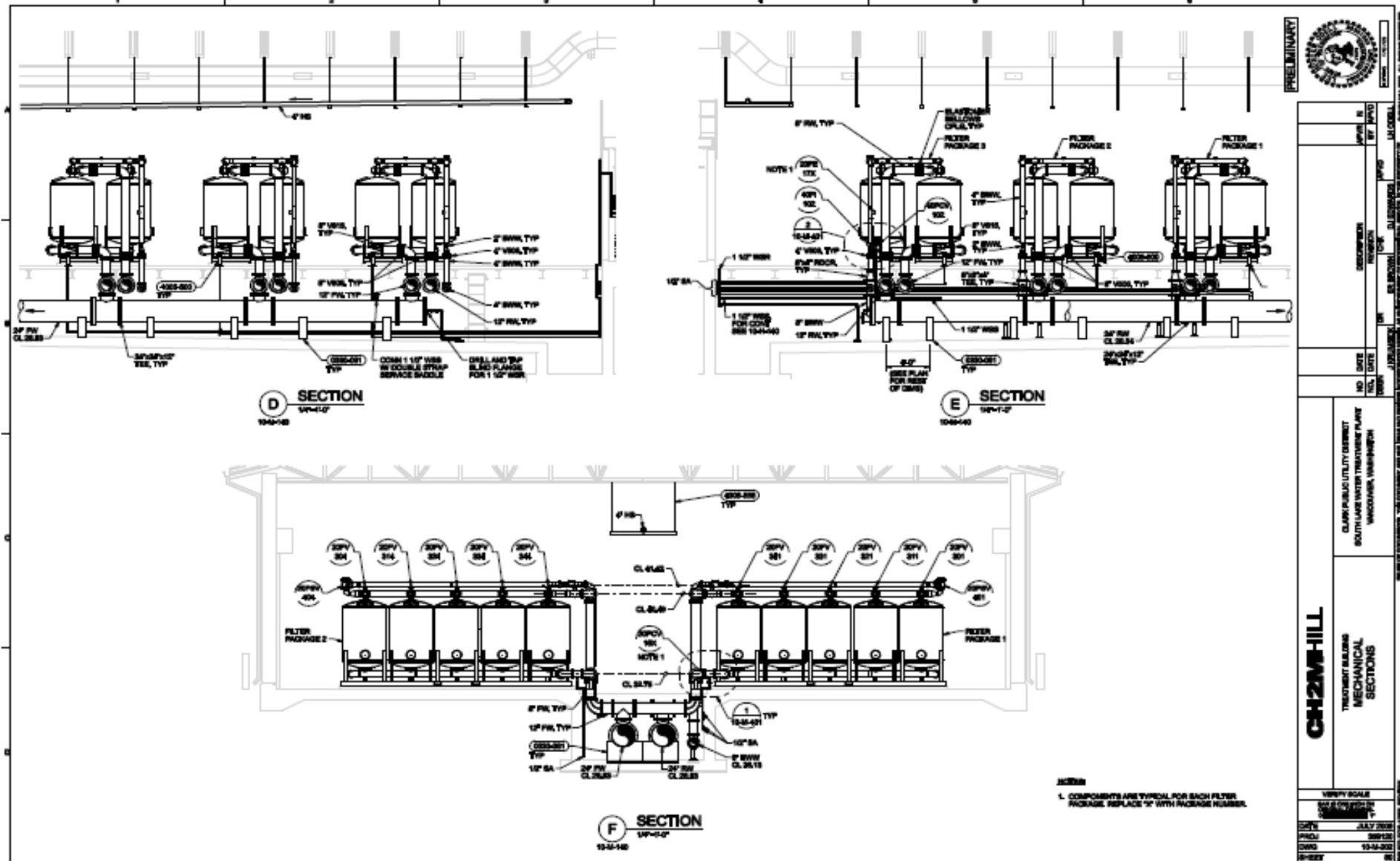
VERMONT BUILDING ARCHITECTURAL ENLARGED FLOOR PLAN

DATE: 07/17/10
 DRAWN BY: JAY BISHOP
 CHECKED BY: JAY BISHOP
 DATE: 07/17/10
 SHEET: 10-A-02

VERIFY SCALE
 SEE DWG 10-A-01 FOR SCALE

PLotted by: JAY BISHOP
 PLOT DATE: 07/17/10
 PLOT SCALE: 1/8"=1'-0"

Filter Sections



PRELIMINARY

CLARK PUBLIC UTILITY DEPARTMENT
SOUTH LAKE WATER TREATMENT PLANT
VANCOUVER, WASHINGTON

NO. DATE
REV. DATE

CH2M-HILL

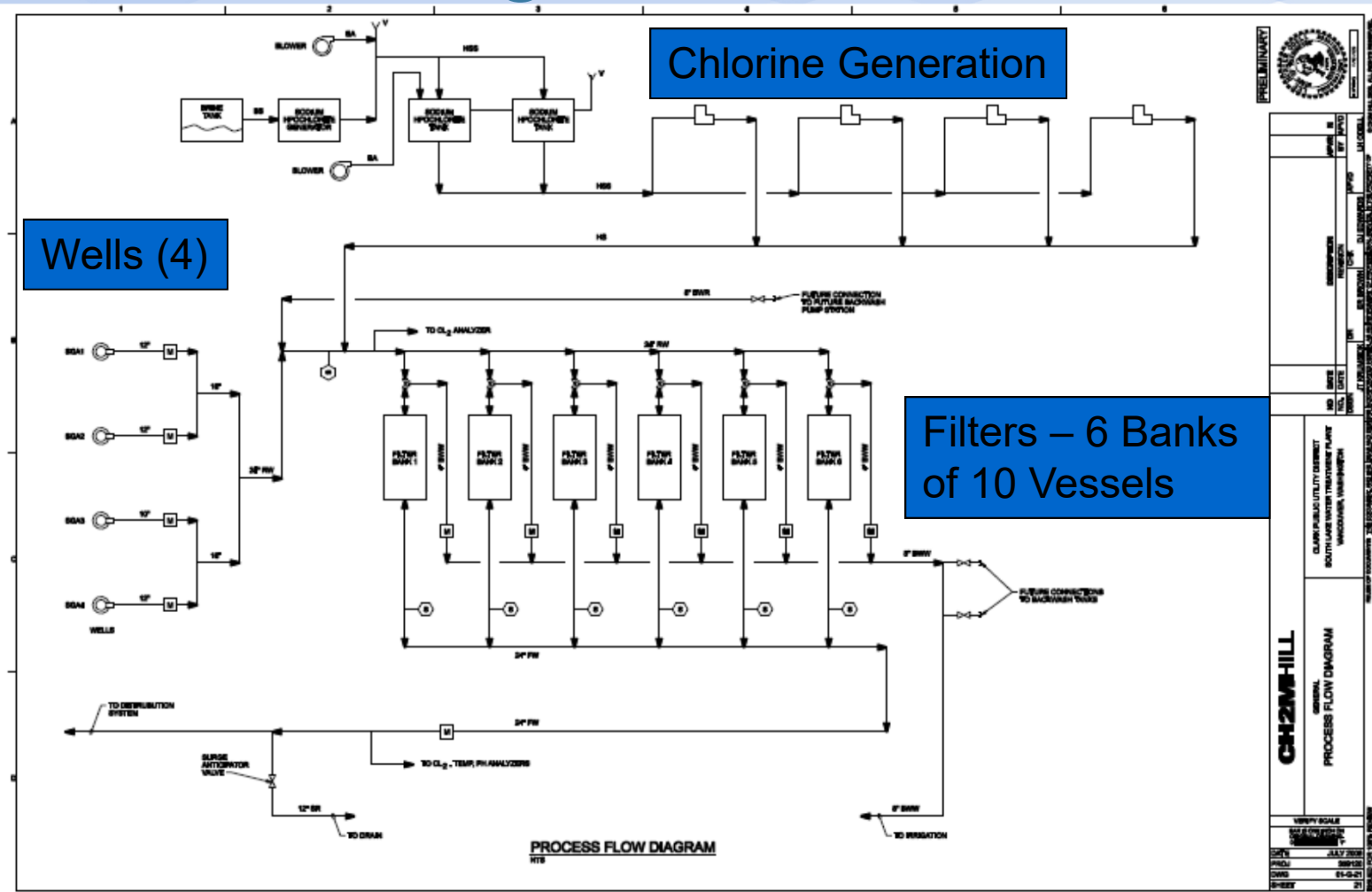
TREATMENT BUILDING
MECHANICAL
SECTIONS

VERIFY SCALE
DATE & TIME FOR IN
10/20/2008

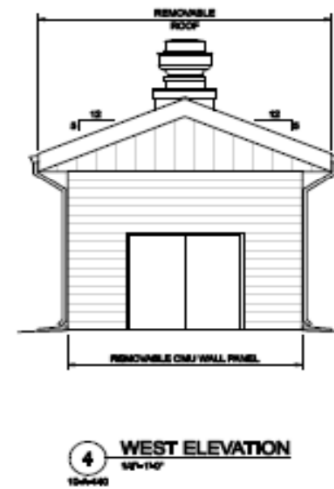
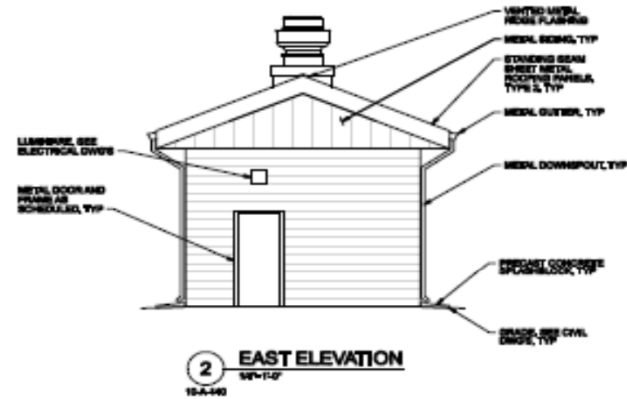
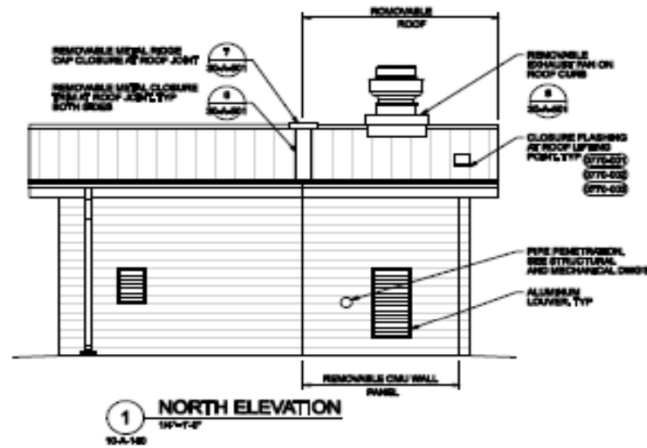
DATE: JULY 2008
 PROJ: 03-01
 DES: 10-2-2008
 SHEET: 01

PLANT No. 20021 PL

Process Diagram



Well Building Elevations



PRELIMINARY

DATE: 07/20/20
BY: [Signature]

NO. DATE
REV. DATE

CLARK HILL COUNTY (SERVING SOUTH LANE WATER TREATMENT PLANT) WOODBRIDGE, VIRGINIA

CH2MHILL

WELL HOUSE
ARCHITECTURAL
BUILDING ELEVATIONS

VERIFY SCALE
DATE: 07/20/20
BY: [Signature]

DWG: JULY 2020
DWG: 20-A-021
SHEET: 102

FILENAME: 20-A-021.dwg PLOT DATE: 7/20/20 PLOT TIME: 7:49:48 AM

Engineer's Estimate

Item	
Site Work	987,720
Yard Piping	640,101
Site Electrical	254,212
Treatment Building	2,103,080
Sanitary P.S.	38,539
Subtotal	\$4,023,652
Overhead, Profit, Mob, Bond	23%?
Total Construction Contract	\$4.95M
Owner Provided Equipment (filters, on-site generation, well pumps)	\$914,000
Total Project Cost	\$5.8M



Schedule

Southlake WTP	2008						2009												
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
100% Design Documents	█																		
Owner Review		█																	
DOH Review		█	█																
City of Vancouver Review		█	█	█															
Well Drilling			█	█															
Equipment Bid Advertisement			█																
Equipment Bid Award					█														
Equipment Delivery										█									
Construction Bid Advertisement						█													
Construction Bid Award							█												
Mobilization							█												
Site Work								█											
Yard Piping									█										
Foundations										█									
Masonry/Structural											█								
Mechanical												█							
Plumbing													█						
HVAC														█					
Electrical															█				
I&C																█			
Programming & Testing																	█		
Start-up																		█	



Questions?

*Clark
Public
Utilities* 

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