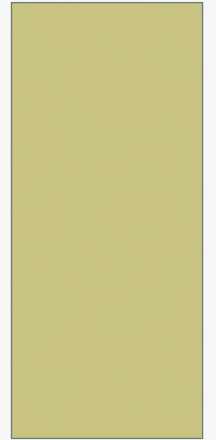


BIG SKY WASTEWATER FACILITY PLAN UPDATE

85 PERCENT PROGRESS REPORT
MARCH 17, 2055



UPDATED PROJECTED FLOW

Population per SFE								Full Buildout Flows			
	2009	2010	2011	2012	2013	Median Population per SFE	Full Buildout Population/SFE	District Full Buildout Flow gallons/month	Lone Moose Meadows Commitment ¹	Cross Harbor Commitment ²	TOTAL FULL BUILDOUT FLOW gallons
January	1.468	0.907	1.720	0.614	0.843	0.909	1.046	22,101,888	4,063,615	4,308,768	30,474,270
February	1.496	1.699	2.521	1.042	1.194	1.249	1.436	27,404,142	3,111,632	5,342,443	35,858,218
March	1.211	0.970	1.037	1.015	1.193	1.063	1.223	25,834,055	4,749,805	5,036,355	35,620,214
April	0.460	0.297	0.499	0.695	0.548	0.499	0.574	16,438,981	2,156,470	2,286,567	20,882,019
May	0.253	0.300	0.417	0.402	0.454	0.300	0.360	12,317,614	1,398,723	1,483,106	15,199,443
June	0.418	0.324	0.327	0.691	0.566	0.502	0.602	17,026,253	2,264,445	2,401,056	21,691,755
July	0.484	0.616	1.473	0.868	0.763	0.618	0.742	14,154,427	2,602,408	2,759,409	19,516,244
August	0.395	0.569	0.387	1.646	0.638	0.615	0.738	15,586,562	2,865,718	2,940,584	21,392,864
September	0.358	0.414	1.436	1.368	1.407	0.789	0.946	19,350,002	3,557,658	3,772,287	26,679,947
October	0.435	0.276	1.639	1.548	0.990	0.469	0.562	11,881,136	2,184,445	2,316,230	16,381,811
November	0.369	0.395	0.440	0.556	1.388	0.556	0.640	13,522,929	2,486,302	2,636,298	18,645,529
December	2.647	2.935	1.170	1.218	2.509	1.536	1.766	37,316,148	6,860,883	7,274,791	51,451,822
District SFE's at years end	4417	4430	4457	4489	4562			232,934,137	38,302,105	42,557,894	313,794,136

1. Lone Moose Meadows flows based ratio of 900/1900 * 80.86 MGY

2. Cross Harbor flows based on ratio of 1000/1900* 80.86 MGY

Flows updated to include LMM and Spanish Peaks

IRRIGATION DISPOSAL CAPACITY

(MILLION GALLONS PER YEAR)

	Wettest year in 10 and TN of 15 mg/L- N	Hot dry year TN of 10 mg/L-N
Meadow Village Course	206	317
YMC	95	160*
Spanish Peaks	30	(Included in 160)
Total	331	477

* Based on 2001 Agreement

EXISTING STORAGE

- **Meadow Village**

- Large Pond = 60.1 MG
- Small Pond = 19.6 MG
- Total Filtered Storage = 79.7 MG

- SBR Effluent = 8.2 MG (but effectively zero due to piping)

Yellowstone Mountain Club

- 80 MG

Total Existing Storage = 159.7 MG

STORAGE REQUIREMENTS NO WINTER DISPOSAL

	Inflow At Full Buildout MG	Meadow Village Precipitation Inches ¹	Precipitation Volume MG ²	Meadow Village Irrigation Volume Maximum Cool-wet Year MG	Pumped Volume to YMC Storage MG	Meadow Village Storage Volume MG	Mountain Village Precipitation Inches	Precipitation Volume MG ³	YMC or Spanish Peaks Disposal MG	YMC Storage MG	Total Storage MG
Oct	16.4	1.80	0.94	0.00	12.00	5.32	2.92	1.40		13.40	19
Nov	18.6	1.74	0.91	0.00	18.00	6.87	3.00	1.43		32.83	40
Dec	51.5	1.84	0.96	0.00	22.00	37.28	3.27	1.56		56.39	94
Jan	30.5	1.70	0.89	0.00	22.00	46.64	3.07	1.47		79.86	127
Feb	35.9	1.35	0.70	0.00	20.00	63.21	2.60	1.24		101.10	164
Mar	35.6	1.91	1.00	0.00	25.00	74.82	3.76	1.80		127.90	203
Apr	20.9	1.94	1.01	0.00	18.00	78.72	3.86	1.84		147.74	226
May	15.2	3.46	1.80	11.78	5.00	78.94	5.68	2.71	9.05	146.41	225
Jun	21.7	3.96	2.06	47.60		55.10	5.07	2.42	37.59	111.24	166
Jul	19.5	2.30	1.20	66.38		9.44	2.80	1.34	47.34	65.24	75
Aug	21.4	2.20	1.15	57.62		-25.64	2.70	1.29	43.26	23.27	-2
Sep	26.7	2.47	1.29	22.60		-20.28	3.64	1.74	23.23	1.78	-18
	314		13.91	205.98				20.25	160.47		
1. Wettest year in 10 Station 0775											
2. Based on pond storage area of 19.2 Acres in Meadow									Total Disposal Volume (MGY)=	366.45	
3. Based on pond surface area of 17.6 acres for 160 MG of storage									Total Inflow Volume including precipitation (MGY)=	347.95	

EXISTING & FUTURE STORAGE

- **Meadow Village**

• Large Pond	=	60.1 MG
• Small Pond	=	19.6 MG
• SBR Effluent	=	<u>8.2 MG</u> (with piping change)
• Total Storage	=	87.9 MG

Yellowstone Mountain Club

• Existing	=	80 MG
• Future	=	<u>50 MG</u>
• Total Storage	=	130 MG

Grand Total Existing and Future = 217.9 MG
Storage Needs (no winter disposal)= 226 MG

STORAGE REQUIREMENT WITH WINTER DISPOSAL

	Inflow At Full Buildout MG	Meadow Village Precipitation Inches 1	Precipitation Volume MG 2	Meadow Village Irrigation Volume Maximum Cool-wet Year MG	Pumped Volume to YMC Storage MG	Meadow Village Storage Volume MG	Mountain Village Precipitation Inches	Precipitation Volume MG 3	YMC or Spanish Peaks Disposal MG	YMC Storage MG
Oct	16.4	1.80	0.94	0	12	5.32	2.92	1.40	3.10	10.30
Nov	18.6	1.74	0.91	0	18	6.87	3.00	1.43	3.00	26.73
Dec	51.5	1.84	0.96	0	22	37.28	3.27	1.56	3.10	47.19
Jan	30.5	1.70	0.89	0.00	22	46.64	3.07	1.47	3.10	67.56
Feb	35.9	1.35	0.70	0.00	20	63.21	2.60	1.24	2.80	86.00
Mar	35.6	1.91	1.00	0.00	25	74.82	3.76	1.80	3.10	109.70
Apr	20.9	1.94	1.01	0.00	18	78.72	3.86	1.84	3.00	126.54
May	15.2	3.46	1.80	11.78	5	78.94	5.68	2.71	7.84	126.42
Jun	21.7	3.96	2.06	47.60		55.10	5.07	2.42	32.57	96.27
Jul	19.5	2.30	1.20	66.38		9.44	2.80	1.34	41.02	56.60
Aug	21.4	2.20	1.15	57.62		-25.64	2.70	1.29	37.48	20.40
Sep	26.7	2.47	1.29	22.60		-20.28	3.64	1.74	20.13	2.02
	314		13.91	206.0				20.25	160.2	
1. Wettest year in 10 Station 0775										
2. Based on pond storage area of 19.2 Acres in Meadow									Total Disposal Volume (MGY)=	366.21
3. Based on pond surface area of 17.6 acres for 160 MG of storage									Total Inflow Volume including precipitation (MGY)=	347.95
									Volume Disposed of on YMC & SP golf Course	139.03

100,000 gallons per day of winter disposal-minimum needed with future storage

WINTER DISPOSAL OPTIONS

- Subsurface drain fields or aquifer injection
- Surface discharge
- Indirect Potable Reuse

ADDITIONAL PROJECT DRIVERS

- Reduction of nitrate detected in Middle Fork as it passes through the Meadow Village Golf Course
 - Plant upgrade for better nitrogen removal
 - Optimized control
- Use of District's water rights for irrigation- to maintain right

SUB-SURFACE DISPOSAL

- Screening criteria
 - Within 1-mile of effluent pipeline
 - 100 foot buffer from surface streams and mapped wetlands
 - Slopes < 35 percent
 - Eliminated areas above landslide areas
 - Included landownership in database

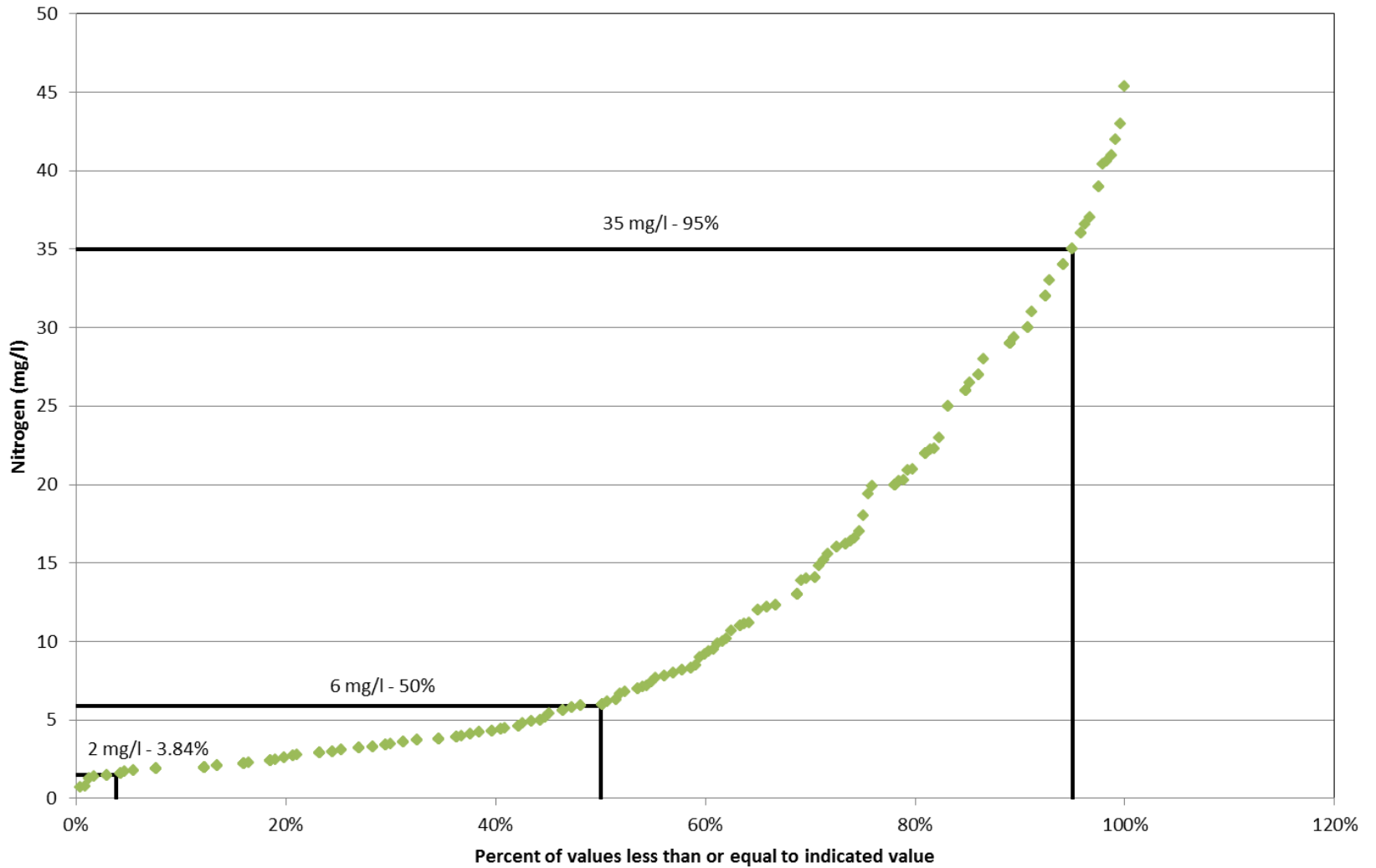
SURFACE DISCHARGE

- Recently adopted numeric nutrient criteria set WQS very low for nitrogen and phosphorous
 - Criteria only apply from July 1 to September 30th
- New discharge would have to comply with non-degradation rules
 - Can be met by limiting discharge flow
 - Need to work with DEQ to determine allowable discharge
- Initial discussions with DEQ personnel indicated permit would probably be issued

PLANT UPGRADE ALTERNATIVES

- Add 3rd basin to increase cycle times
- Optimize operation (on-going modelling)
 - Side stream impacts
 - Change aeration control
 - SRT/ wasting controls
- Add VFD controls to blowers
- Cover basins to improve maintenance conditions
- Other minor modifications
 - Fix freezing of foam control line
 - Correct clogging of plant water pump

Effluent Total Nitrogen



◆ Effluent Total Nitrogen