

MEMORANDUM

TO: Erik Boe, Regional Office, Idaho Department of Water Resources

FROM: Christopher H. Meyer *all*

RE: Gap Analyses for potable system Permit No. 63-32835 (RAFN), irrigation system Permit Application No. 63-33968 (non-RAFN), and irrigation system Permit Application No. 63-34229 (non-RAFN)

DATE: September 19, 2018

Introduction

This memorandum is submitted on behalf of the City of Nampa in connection with the three above-referenced water rights.

On June 15, 2018, the City provided IDWR with additional information (including a gap analysis) in support of its request for reinstatement and licensing of lapsed Permit No. 63-32835 (a RAFN right primarily associated with the City's potable water system).

In addition, the City has two pending permit applications for water rights primarily associated with its irrigation water system: Nos. 63-33968 and 63-34229. In two letters dated November 25, 2016 addressed to the City's water rights consultant (SPF Water Engineering), you requested the City to provide additional information regarding these applications. On November 27, 2017, SPF provided the requested information regarding No. 63-33968. Concurrent with this memorandum, SPF is providing the requested information regarding No. 63-34229.

On January 31, 2018, you prepared a memorandum addressing the City's November 27, 2017 information submission for No. 63-33968 ("*Boe Memo*"). You concluded that the information submitted by the City was sufficient to allow that permit application to proceed to the advertising stage. Publication occurred on May 3 and May 10, 2018. No protest has been filed.

The City's information submission for both permit applications (63-33968 and 63-34229) included gap analyses showing the gap between the City's portfolio of ground water rights

historically associated with its irrigation water system and projected water demand for that system at the end of the development period (based on the year 2022).¹

Your memorandum of January 31, 2018 confirmed and approved the City's irrigation system gap analysis. "Overall, this corresponds to an anticipated shortfall of 98.7 cfs in 2022 (end of the development period)." *Boe Memo* at 2. Accordingly, you determined that the irrigation system gap analysis is sufficient to "meet basic requirements at this pre-application stage." *Boe Memo* at 3.

However, you also observed that a combined gap analysis (for the irrigation and potable system demand and their water rights) may be required later. "While sufficiently supporting the City's water needs at this point in the pre-advertising process, the gap analysis provided with SPF's response does not reflect all components of the City's municipal system (excludes Domestic System, Figure 1). Additional information and/or clarification may be necessary prior to issuance of any permit." *Boe Memo* at 3.

Accordingly, the City has prepared a series of combined gap analyses, which we provide to IDWR in this memorandum. In addition, for comparison and other purposes, we provide individual gap analyses for the potable and irrigation systems.

These gap analyses are consistent with previously submitted data, but are more detailed and comprehensive.²

¹ The irrigation gap analyses included only ground water rights. As you observed, "While system demand is primarily met with surface water capacity from Pioneer Irrigation District, Nampa & Meridian Irrigation District, and Boise-Kuna Irrigation District, SPF notes that the full demand may be placed on the City's portfolio [of ground water rights] during periods when ditch water is not available such as shoulder seasons or as emergency backup to ditch water system failure." *Boe Memo* at 3.

² Differences include the following:

The combined gap analyses provided in the June 15, 2018 letter (Permit No. 63-32835) include only the years 2030 and 2040 (because the planning horizon for that RAFN permit ends in 2030). Accordingly, that submission does not address your request for a combined gap analysis measured at the end of the 5-year development period for Application Nos. 63-32835 and 63-34229.

As discussed further in the Table 2 Notes below, the gap analyses included here consistently include all dates from the source master plan documents. We also include data (based on interpolation between 2020 and 2025) for a range of years intended to cover the end of development periods for the two pending applications.

The gap analyses submitted for Application Nos. 63-33968 and 63-34229 display gap information based on peak hourly demand and average season demand. The gap analyses submitted in this memorandum omit the information on average season demand, because that is not relevant either to RAFN analysis (under the Weaver Memorandum) or the permitting of non-RAFN rights (under the Peppersack Memorandum).

The gap analyses submitted for Application Nos. 63-33968 and 63-34229 did not display information based on peak day demand (aka maximum day demand). That information is included in today's submission, because both are discussed in the Peppersack Memorandum.

Finally, the gap analyses included here consistently include all dates from the source master plan documents, as well as two interpolated dates (2022 and 2023) that correspond to the anticipated end of the development period for the two pending applications.

This memorandum also serves to ensure that the gap analysis information provided to IDWR at various times in various contexts is consistent.

The Gap Analyses

We begin with a display of the city's water rights portfolio in Table 1. Water demand is displayed in Table 2. Three sets of gap analyses comparing various components of the portfolio with various components of demand are set out in Tables 3, 4, and 5.

Table 1 - Portfolio of Water Rights

PORTFOLIO		
Current water rights portfolio	Licensed & decreed (cfs)	Including permits & applications (cfs)
Potable (integrated system)	49.55	54.55
Irrigation	77.04	86.34
TOTAL	126.59	140.89

Table 2 - Water Demand (Peak Day and Peak Hour)

PEAK DAY DEMAND (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Potable	18	24	25	25	26	26	29	32	35	100
Irrigation	116	134	138	141	143	145	157	172	191	534
TOTAL	134	158	163	166	169	171	186	204	226	634

PEAK HOUR DEMAND (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Potable	24	31	32	33	33	34	38	42	45	129
Irrigation	155	179	185	188	191	194	210	230	255	714
TOTAL	179	210	217	221	224	228	248	272	300	843

Table 3 – Combined Gap Analyses (Potable & Irrigation)

COMBINED GAP ANALYSES - POTABLE & IRRIGATION (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on peak day demand)										
Total demand (peak day)	134.00	158.00	163.00	166.00	169.00	171.00	186.00	204.00	226.00	634.00
Total rights today (w/o permits and applications)	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59
Total rights today (w/ permits and applications)	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89
DIFFERENCE (peak day gap) (w/o permits and applications)	7.41	31.41	36.41	39.41	42.41	44.41	59.41	77.41	99.41	507.41
DIFFERENCE (peak day gap) (including permits & applications)	-6.89	17.11	22.11	25.11	28.11	30.11	45.11	63.11	85.11	493.11
Gap (based on peak hour demand)										
Total demand (peak hour)	179.00	210.00	217.00	221.00	224.00	228.00	248.00	272.00	300.00	843.00
Total rights today (w/o permits and applications)	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59	126.59
Total rights today (w/ permits and applications)	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89	140.89
DIFFERENCE (peak hour gap) (w/o permits and applications)	52.41	83.41	90.41	94.41	97.41	101.41	121.41	145.41	173.41	716.41
DIFFERENCE (peak hour gap) (including permits & applications)	38.11	69.11	76.11	80.11	83.11	87.11	107.11	131.11	159.11	702.11

Table 4 – Irrigation Gap Analyses

IRRIGATION GAP ANALYSES (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on peak day demand)										
Total demand (peak day)	116.00	134.00	138.00	141.00	143.00	145.00	157.00	172.00	191.00	534.00
Total rights today (w/o permits and applications)	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04
Total rights today (w/ permits and applications)	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34
DIFFERENCE (peak day gap) (w/o permits and applications)	38.96	56.96	60.96	63.96	65.96	67.96	79.96	94.96	113.96	456.96
DIFFERENCE (peak day gap) (including permits & applications)	29.66	47.66	51.66	54.66	56.66	58.66	70.66	85.66	104.66	447.66
Gap (based on peak hour demand)										
Total demand (peak hour)	155.00	179.00	185.00	188.00	191.00	194.00	210.00	230.00	255.00	714.00
Total rights today (w/o permits and applications)	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04	77.04
Total rights today (w/ permits and applications)	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34	86.34
DIFFERENCE (peak hour gap) (w/o permits and applications)	77.96	101.96	107.96	110.96	113.96	116.96	132.96	152.96	177.96	636.96
DIFFERENCE (peak hour gap) (including permits & applications)	68.66	92.66	98.66	101.66	104.66	107.66	123.66	143.66	168.66	627.66

Table 5 – Potable Gap Analyses

POTABLE GAP ANALYSES (cfs)	2012	2020	2022	2023	2024	2025	2030	2035	2040	Buildout
Gap (based on peak day demand)										
Total demand (peak day)	18.00	24.00	25.00	25.00	26.00	26.00	29.00	32.00	35.00	100.00
Total rights today (w/o permits and applications)	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55
Total rights today (w/ permits and applications)	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55
DIFFERENCE (peak day gap) (w/o permits and applications)	-31.55	-25.55	-24.55	-24.55	-23.55	-23.55	-20.55	-17.55	-14.55	50.45
DIFFERENCE (peak day gap) (including permits & applications)	-36.55	-30.55	-29.55	-29.55	-28.55	-28.55	-25.55	-22.55	-19.55	45.45
Gap (based on peak hour demand)										
Total demand (peak hour)	24.00	31.00	32.00	33.00	33.00	34.00	38.00	42.00	45.00	129.00
Total rights today (w/o permits and applications)	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55	49.55
Total rights today (w/ permits and applications)	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55	54.55
DIFFERENCE (peak hour gap) (w/o permits and applications)	-25.55	-18.55	-17.55	-16.55	-16.55	-15.55	-11.55	-7.55	-4.55	79.45
DIFFERENCE (peak hour gap) (including permits & applications)	-30.55	-23.55	-22.55	-21.55	-21.55	-20.55	-16.55	-12.55	-9.55	74.45

Explanatory Notes

- The Excel spreadsheet from which the tables above were copied will be provided to IDWR by email, so that you may examine the formulas and make any adjustments you deem appropriate.

Table 1 Notes

- The portfolio totals in Table 1 are based on the water rights portfolio spreadsheets found in (1) Attachment C to the November 27, 2017 letter (Application No. 63-33968), (2) Attachment C to the June 15, 2018 letter (Permit No. 63-32835), and (3) Attachment F to the September 19, 2018 letter (Application No. 63-34229).
- The portfolio totals in Table 1 include only water rights employed in the City's integrated water delivery systems. Three water rights (Nos. 63-12266, 63-11339, and 63-20264) totaling 0.33 cfs are excluded from the potable system portfolio because they are "stand alone" rights that do not serve the integrated potable water system.

Table 2 Notes

- The water demand data set out in Table 2 is based on information in the City's two most recent master plans, both of which were prepared by Keller Associates:

Water System Master Plan (September 2014) (for the potable system) (Table 5.4 at page 5-8) and *Irrigation Master Plan* (May 2014) (Table 5.4 at page 5-6). This source data was provided to IDWR as Attachments A and B to SPF's letter of June 15, 2018 in connection with Permit No. 63-32835. It is reproduced again here as Attachments A and B to this memorandum.

- The Keller Master Plans display their demand projections in gpm. Table 2 above converts gpm to cfs ($\text{gpm} \times 0.0022282 = \text{cfs}$), and rounds to a whole number.
- The Keller Master Plans provide demand forecasts for the years 2012, 2020, 2025, 2030, 2035, 2040, and full buildout.
- We have added columns for the years 2022, 2023, and 2024 based on straight line interpolation between the corresponding 2020 and 2025 data points. Projections for 2022 were included in the above-referenced information submissions for Application Nos. 63-33968 and 63-34229. This was based on the prior expectation that the permits would issue in 2017 (resulting in a development period ending in 2022). We have now added 2023 and 2024, which are likely to match the end of the development periods for these permits.

Tables 3, 4, and 5 Notes

- Tables 3, 4, and 5 display six gap analyses (two for the combined potable and irrigation systems, two for the irrigation system alone, and two for the potable system alone). In each of the three sets, one gap analysis is based on peak day demand and one is based on peak hour demand.
- We believe that peak hour demand (rather than peak day demand) is the appropriate measure, because the City has very limited storage available.
- As we have discussed in prior communications with IDWR, the Keller Master Plans contained future demand projections that were based on data influenced by the Great Recession. Accordingly, it is likely that these projections are on the low side. The City has budgeted money to revise its master plans and update its demand projections. At this time, however, the Keller projections are the most up-to-date information available.
- Each of the six gap analyses display two gaps. One is based on a portfolio consisting only of licensed and decreed water rights. The other is also includes permits and applications for permits serving the associated integrated water system(s).
- A positive number in the gap analysis indicates that there is a gap, *i.e.*, a shortfall between the portfolio and water demand.

- The Combined Gap Analyses (Table 3) and the Potable Gap Analyses (Table 5) are consistent with the information submitted to IDWR in SPF's letter of June 15, 2018 (Permit No. 63-32835).
- The Irrigation Gap Analysis (Table 4) is consistent with the information submitted by SPF to IDWR on November 27, 2017 (Application Nos. 63-33968 and 63-34229).

Conclusions

- As IDWR has recognized, the integration of the City's potable and irrigation water systems and their associated water rights is well underway, but is an incremental process.
- Given that integration is underway, the City concurs with IDWR's assessment that it is appropriate to display and evaluate gap analyses based on the combined potable and irrigation systems.
- To some extent, these Combined Gap Analyses may overstate the water available (*i.e.*, may understate the gap), because of the practical reality that not all systems and water rights are fully integrated today.
- As noted in the City's letter of June 15, 2018 (Permit No. 63-32835), the Potable Gap Analyses show that there is no gap until sometime after the year 2040. For that reason, the City urged in that letter that the permit be reinstated based on the Combined Gap Analyses.
- The Combined Gap Analyses show a gap in every year and category (except for the year 2012 based on peak day demand). Any way you look at it, there will be a gap by the end of the development period for Application Nos. 63-33968 and 63-34229. Likewise, there is a gap at the end of the planning horizon (and even today, measured by peak hour demand) for purposes of the reinstatement and licensing of Permit No. 63-32835
- The Irrigation Gap Analyses shows a gap in every category—even in 2012. Thus, there is no need to look to the end of the development period.
- In sum, these gap analyses support (1) the reinstatement and licensing of Permit No. 63-32835 and (2) the processing of applications and issuance of Permit Nos. 63-33968 and 63-34229.

Follow-up

Please do not hesitate to contact me, SPF, or the City's Public Works Department if you have any follow-up questions or concerns.

Let me conclude by thanking the Department once again for its assistance in evaluating and processing the City's applications and requests discussed above. The thoughtful analysis and insights that you and other IDWR staff have provided is very much appreciated.

Attachments:

- A: Excerpt of *Water System Master Plan* (September 2014) (for the potable system) (Table 5.4 at page 5-8)
- B: Excerpt of *Irrigation Master Plan* (May 2014) (Table 5.4 at page 5-6)

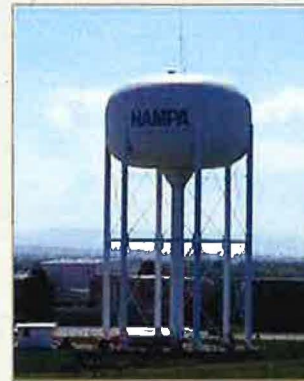
cc: Shelley W. Keen, Water Allocation Bureau Chief
Nick Miller, Regional Manager, Western Regional Office
Tom Points, P.E., Director, Nampa Public Works Department
Nate Runyan, P.E., Deputy Director, Nampa Public Works Department
Terry M. Scanlan & Roxanne Brown, SPF Water Engineering, LLC

Attachment A EXCERPT OF *WATER SYSTEM MASTER PLAN* (SEPTEMBER 2014) (FOR THE POTABLE SYSTEM) (TABLE 5.4 AT PAGE 5-8)

*City of Nampa,
Idaho*



Water System Master Plan



September 2014
Final



213051/3/13.345

Table 5.4: Water Demand Forecast

	Population	Jobs	ADD (gpm)					MDD (gpm)					PHD (gpm)				
			Zone 1	Zone 2	Zone 3	Zone 4 ^a	Total	Zone 1	Zone 2	Zone 3	Zone 4 ^a	Total	Zone 1	Zone 2	Zone 3	Zone 4 ^a	Total
2012 Design	82,160	30,893	0	4,148	792	24	4,964	0	6,886	1,314	40.4	8,240	0	8,951	1,708	52.6	10,712
2020^b	92,334	37,390	155	4,901	1,459	31	6,545	257	8,135	2,422	51.6	10,865	334	10,575	3,149	67.1	14,125
2025	101,727	42,630	164	5,293	1,646	38	7,142	273	8,787	2,733	63.1	11,856	355	11,423	3,553	82.1	15,412
2030	113,393	48,457	177	5,754	1,877	47	7,855	293	9,551	3,116	77.9	13,039	381	12,417	4,051	101.3	16,950
2035	128,574	54,758	191	6,328	2,154	56	8,729	317	10,505	3,575	93.0	14,490	412	13,656	4,647	120.9	18,836
2040	137,810	61,712	200	6,727	2,400	64	9,390	331	11,167	3,984	105.8	15,588	431	14,517	5,179	137.6	20,264
Buildout	397,474	231,099	363	16,850	9,005	688	26,907	603	27,971	14,948	1,143	44,665	784	36,363	19,433	1,485	58,065

^aZone 4 includes only the area directly serviced by Belmont

New Residential: ADD = 58 gpcd (includes 7% waterloss)

MDD/ADD = 1.66

^bAdded two new 450 gpm industrial demands for 2020

New Commercial: ADD = 60 gpcd (includes 7% waterloss)

PHD/MDD = 1.3

Attachment B EXCERPT OF *IRRIGATION MASTER PLAN* (MAY 2014) (TABLE 5.4 AT
PAGE 5-6)

City of Nampa, Idaho



Irrigation Master Plan



May 2014 – Final



213051/4/14-110

5.5 DISTRIBUTION OF DEMANDS

The City of Nampa's GIS system includes a database of lands that are irrigated with the City's pressure irrigation system. Figure 3 in Appendix A illustrates the location and distribution of these parcels. According to City GIS staff, approximately 95% of the parcels receiving pressure irrigation service are accounted for in the GIS. Existing demands were distributed to these parcels based on the assumptions in Table 5.3. The shading in each parcel showing in Figure 3 reflects the portion of land that is irrigable. For developed commercial areas, the portion is small, while larger residential developments and large green spaces are much higher.

5.6 WATER DEMAND FORECAST

Demands were forecasted using available Compass data. Populations, numbers of housing units, and the number of jobs per acre were determined using Compass projections for TAZs in the planning area, and are summarized in Table 5.4. These projected Compass values were then joined with City future land development plans to assign jobs to commercial areas and housing units and populations to residential zones. Irrigated acreage was estimated for each TAZ. Current demands were based on production and irrigated acreage, while future demands developed irrigated acreage based on increases in population and jobs.

Table 5.4: Demand Forecast

Year	Population	Jobs	Irrigated Acres	Average Season Demand (gpm)	Max Month (gpm)	Max Week (gpm)	Max Day (gpm)	Max Hour (gpm)
Current	82,160	30,893	4,225	30,675	43,884	47,322	51,929	69,480
2020	92,334	37,390	4,877	35,409	50,657	54,625	59,943	80,202
2025	101,727	42,630	5,288	38,394	54,927	59,230	64,996	86,963
2030	113,393	48,457	5,740	41,674	59,619	64,290	70,549	94,393
2035	128,574	54,758	6,289	45,666	65,330	70,449	77,307	103,435
2040	137,810	61,712	6,970	50,600	72,389	78,060	85,660	114,610
Buildout	397,474	231,099	19,494	141,525	202,468	218,329	239,585	320,557