

Attachment 2

WATER WITHDRAWAL RATES

With the addition of the four new wells and tunnel, the water withdrawal rate has increased to an average of 40 MGD. However, the Wellhead Protection Plan (WHPP) is based on a withdrawal rate not to exceed 60 MGD.

At present, LWC is pumping only the wells attached to the tunnel, in order to evaluate the tunnel/well system. At a later date, it is anticipated that the Demo Well (Well #1) will be placed back on line. LWC has not increased the maximum pumping capacity of the plant, but has, instead, eliminated any surface water withdrawal from the Ohio River, and is only using water from the RBF wells.

Water Quality

On November 30, 2010, Louisville Water Company began pumping from the tunnel-well system at B.E. Payne WTP. Figure 2.1 illustrates the change in source water alkalinity, hardness and pH since conversion to the new tunnel-well system. We observed a 12-16 month stabilization period for most water quality parameters, which was longer than previously observed with the original collector well (CW-1); due in large part to lower shared yield from each of the four tunnel wells compared to the total yield of CW-1.

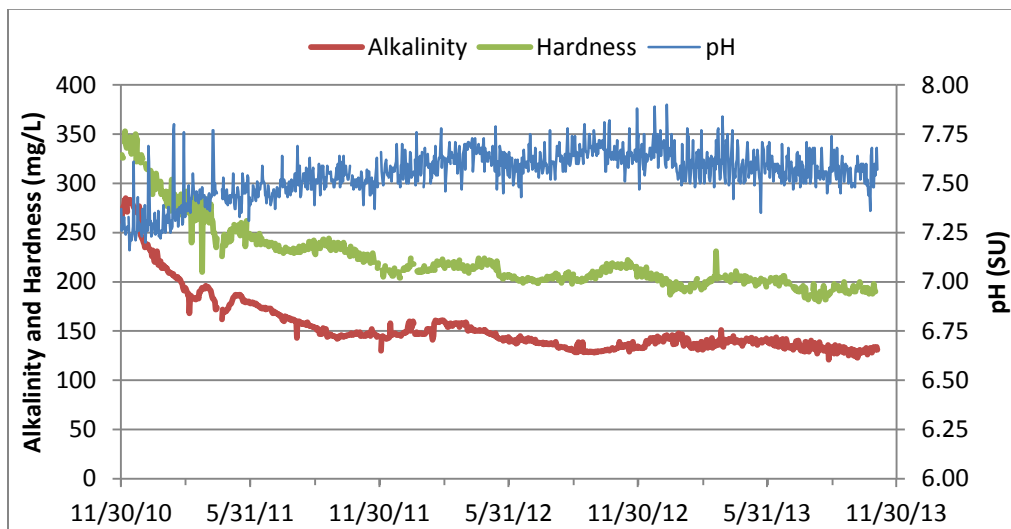


Figure 2.1. Water Quality of Tunnel-well System since 11/30/2010.

Table 2.1 shows year over year historical source water quality data for several key parameters important in the RBF treatment process. The water quality produced by the tunnel-well system in 2013 was very similar to year over year monitoring of CW-1 from 2000 to 2010. As an example, alkalinity and hardness monitoring plays a key factor in the lime softening process. At startup, alkalinity and hardness levels

peaked at 285 and 353 mg/L, respectively, and have since leveled off at 137 and 198 mg/L on average for 2013; slightly lower than average results for CW-1 in the 10 years prior.

A similar trend, but in reverse, was observed for pH, rising from a low of 7.16 SU in 2010 to an average of 7.59 SU in 2013; consistent with average pH results for CW-1 in the 10 years prior. Turbidity continues to improve, with declining variability year over year since startup; resulting in the lowest annual average for the tunnel-well system, 0.28 NTU, in 2013. Average turbidity in the tunnel-well system has not reached the levels previously observed in CW-1. While turbidity will likely continue to decline over time, it is uncertain whether the tunnel-well system will ever produce <0.1 NTU water like that of CW-1, due in part to system design and complexity and other factors such as aquifer properties and pumping operations. Average temperatures also appear to be trending slightly lower than previous 10-year averages.

Table 2-1. Historical Source Water Quality Results for B.E. Payne WTP.

YEAR	ALKALINITY			HARDNESS			PH			TURBIDITY			TEMPERATURE		
	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG	MIN	MAX	AVG
2000	116	187	159	182	260	218	7.53	7.87	7.63	0.05	2.0	0.12	NA	NA	NA
2001	142	185	159	177	250	212	7.38	7.80	7.64	0.04	0.97	0.08	NA	NA	NA
2002	135	181	154	176	266	216	7.40	7.76	7.61	0.04	0.40	0.07	NA	NA	NA
2003	128	163	143	186	232	209	7.34	7.78	7.61	0.03	0.21	0.06	NA	NA	NA
2004	130	183	149	185	232	207	7.29	8.10	7.62	0.04	0.61	0.07	52.6	88.3	65.9
2005	112	161	149	180	236	214	7.44	8.19	7.59	0.04	0.30	0.07	51.4	78.4	64.2
2006	122	176	159	191	250	226	7.39	7.87	7.58	0.03	0.51	0.06	56.1	73.6	64.6
2007	114	168	145	199	235	217	7.20	8.01	7.63	0.04	0.56	0.07	53.0	75.6	65.5
2008	112	159	143	198	248	218	7.54	7.83	7.65	0.04	0.12	0.06	51.7	75.0	64.6
2009	132	165	146	202	256	225	7.53	8.06	7.74	0.04	0.64	0.07	54.4	73.0	64.1
2010*	142	173	154	203	245	217	7.36	8.08	7.82	0.03	0.54	0.06	51.9	74.8	64.1
2010*	243	285	272	321	353	336	7.16	7.61	7.28	0.08	6.2	2.4	56.8	58.5	57.9
2011	130	240	172	203	320	248	7.20	7.80	7.47	0.12	3.6	0.90	49.3	73.0	60.7
2012	128	161	142	198	224	210	7.43	7.89	7.63	0.09	2.7	0.56	50.0	72.7	61.3
2013	121	167	137	180	233	198	7.35	7.90	7.59	0.05	1.2	0.28	48.6	70.2	59.2

* CONVERSION FROM CW-1 TO TUNNEL-WELL SYSTEM ON 11/30/2010

Attachment 3

WELL LOGS AND OTHER INFORMATION

Well logs of the new wells (Wells #2, #3, #4, and #5) are not available at this time. However, a generalized construction diagram is available and has been included within this update. General construction details may be seen on the following pages.

Attachment 4

LOCAL PLANNING TEAM MEMBERS

The Local Planning Team (LPT) has played an integral part in the development of the WHPP. The group is composed of representatives of diverse interest groups, including members from public organizations, regulatory agencies, government and public service agencies, businesses, local residents, and developers. At present, there are thirty members of the LPT, excluding LWC personnel, who serve as committee chairpersons.

In order to make effective use of the variety of the areas of expertise needed for the LPT to make informed decisions, the LPT was divided into several committees, each of which were charged with specific goals. The LPT committees and general committee goals are listed below:

- Potential Contaminant Identification Committee – locate and identify potential contaminants within the WHPAs, first by windshield survey, then by more comprehensive site interviews;
- Historical Use Committee – determine prior land uses, and locations of previous contaminant sources that are not currently in operation within the WHPAs;
- Management Plan Committee – develop a management strategy for the potential contaminants within the different WHPAs, based on the risk for contamination to the water supply;
- Compliance Committee – encourage owners/operators to voluntarily comply with existing regulations, ordinances, and laws, and contact local, state, and federal agencies for help in enforcing compliance issues;
- Contingency Plan Committee – develop a contingency strategy for prompt response in emergency and non-emergency events to minimize the impacts of contamination incidents; and
- Public Education/Outreach Committee – educate the public about wellhead protection, best management practices, existing regulations and rules, and any new regulations or ordinances pertaining to the WHPAs developed by the Management Committee.

Once the majority of the potential contaminants were discovered, the Potential Contaminant ID/Historical Use Committee was reformed and renamed as the Site Interview Committee. This committee was charged with performing site interviews at specific commercial establishments to acquire additional information about the potential contaminants on site, and for public education and outreach.

Delineation of the Wellhead Protection Areas

David Schafer & Associates (DS & A) completed a detailed groundwater model for the Louisville Water Company. The modeling effort included delineation of the Wellhead Protection Areas for the collector well located at the B. E. Payne Plant.

In order to provide LWC with the most conservative estimate of the WHPAs, DS&A used the time of travel (TOT) of 180 day, 5 year, 10 year, and steady state conditions within the area.

Based on these TOTs, the WHPA was divided into three WHPAs:

- WHPA #1 – the area is the nearest in proximity to the well, up to 180 days TOT, and requires the highest degree of protection from potential contamination.
- WHPA #2A – representing the area up to a 5 year TOT, this contains a large area that is primarily residential, but requires a high degree of protection from potential contamination.
- WHPA #2B – representing the area up to a 10 year TOT, this contains a large area that is commercial in nature, as well as residential. The area will require a medium to high degree of protection from potential contamination.
- WHPA #3 – representing the area out to steady state conditions (10 years plus TOT), the area will require a low to medium degree of protection from potential contamination.

A map depicting the location of the various wellhead protection areas may be seen in Figure 1-1.

At present, the Local Planning Team consists of several permanent members, who represent various agencies for the local and state governments, as well as private citizens who have a vested interest in the program. The local organizations and departments are listed below:

- Harrods Creek Fire and Rescue
- Jefferson County Soil and Water District
- Metro Police Department – Homeland Security Unit
- Emergency Management
- Air Pollution Control Board
- Mayor of the City of Prospect
- Metro Solid Waste Management
- Louisville Metro Works Dept.
- MSD Director of Engineering, or his representative
- Jefferson County Sheriff
- MSD Emergency Response Supervisor
- Greater Louisville Sierra Club
- Louisville Metro Health Department
- Louisville Metro Attorney
- Louisville Metro EMS
- City Administrator, City of Prospect
- River Fields, Inc.
- Louisville Homebuilders
- Louisville Metro Planning and Design Services
- Hunting Creek Golf Course
- Local Residents, (4)

State representatives include the following:

- Division of Water, Wellhead Protection Coordinator
- Jefferson County Cooperative Extension
- Division of Water, Supervisor
- Department of Agriculture

Local Planning Team members change frequently, as personnel within the departments and organizations listed above change frequently.

Attachment 5

DELINEATION

DESCRIPTION OF THE REGIONAL GEOLOGY AND HYDROLOGY

Louisville Water Company's consultant, Dave Schafer & Associates (DS&A) has prepared a detailed report of the groundwater modeling for the delineation of the Wellhead Protection Areas. This report includes a description of the regional geology and hydrology of the Prospect Area and of the collector well. DS&A's report may be seen in the attached folder.

Attachment 6

MAP OF THE WELLHEAD PROTECTION AREA

The map of the Wellhead Protection Area (WHPA) may be seen in Figure 1.1. However, an additional map has been included within Attachment 6, for ease of use of this update.