



# SUSQUEHANNA RIVER BASIN COMMISSION

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**Docket No. 20040905**

**Approval Date: September 8, 2004**

## **EPHRATA AREA JOINT AUTHORITY**

Groundwater Withdrawal (30-Day Average) of 1.08 mgd from Well 4,  
for Public Water Supply,  
Borough of Ephrata, Lancaster County, Pennsylvania

### **Review Authority**

This project is subject to review pursuant to Article 3, Section 3.10 of the Susquehanna River Basin Compact, P.L. 91-575, 84 Stat. 1509 et seq., and Commission Regulations §803.4, relating to projects requiring review and approval, and §803.43, relating to groundwater withdrawals. The Commission received the application on November 24, 2003.

### **Description**

**Purpose.** The purpose of the application is to request approval for the withdrawal of groundwater for distribution in a municipal water supply system.

**Location.** The project is located in the Lower Susquehanna River Subbasin, HUC 02050102, Conestoga River Watershed, Borough of Ephrata, Lancaster County, Pennsylvania.

**Project Features.** The project sponsor has requested approval for the withdrawal (30-day average) of 1.08 million gallons per day (mgd) of water from Well 4. The well will be used as a source to supply water to a municipal water supply system that currently relies on Wells 1 and 2 (Commission Docket Nos. 19800205 and 19940706, respectively), and a surface water intake on Cocalico Creek (Commission Docket No. 19890305).

The Commission previously approved a withdrawal of 1.08 mgd from Well 4 in 1994 (Commission Docket No. 19940706), however, Ephrata Area Joint Authority (EAJA) modified the well in 2003 to increase the yield and well efficiency. Well 4, as modified, allows water to be drawn from deeper zones in the aquifer and its use may result in new potential impacts. Therefore, the Commission determined that the well should be evaluated as a new source.

Well 4 is located on the southwest side of the Borough of Ephrata, about 100 yards from an unnamed tributary to Cocalico Creek. The Akron Borough's Roland Park well field is located to the west, approximately 1,800 feet from Well 4.

Well 4 was drilled in 1986 to a depth of 656 feet. The well is drilled through the Cocalico Formation (phyllitic shale and siltstone) into carbonate bedrock. All of the water yielding zones in Well 4 are in the carbonate bedrock.

The well is constructed with a 12-inch-diameter inner steel casing to a depth of 113 feet below ground surface (bgs), a 16-inch diameter outer casing to a depth of 20 feet bgs, and a 12-inch diameter open rock borehole to a depth of 656 feet bgs.

Water quality testing documented levels of sulfate and total dissolved solids (TDS) that were above the secondary drinking water standards. The well was modified using grout and stone plugs in 1989, 1991 and 1999 in order to mitigate the water quality problems. After each modification, water quality improved for several months to a few years, but with some loss of yield and well efficiency.

The project sponsor removed all of the modifications in 2003 to regain the lost yield and well efficiency, and intends to treat the water for sulfate, TDS and hardness.

The public water supply system has an existing average daily demand of 1.76 mgd, and an existing maximum daily demand of 2.76 mgd. The average daily demand is projected to grow to 4.74 mgd by 2030. The project sponsor serves the Borough of Ephrata, Ephrata Township and Clay Township.

The wastewater generated throughout the water system distribution area is discharged to the sanitary sewer system and treated at Ephrata Wastewater Treatment Facilities 1 and 2, which discharge to the Cocalico Creek.

**Pumping Test.** A 48-hour constant-rate pumping test for Well 4 was conducted from December 21 to 23, 2003, with prior Commission approval. In addition to the pumping well, monitoring included five residential/commercial wells, nine municipal wells (five Akron Borough wells and four EAJA wells), an Akron Borough water supply spring (SP-1), five stream locations (using weirs or flumes, and piezometers) and one wetland (piezometers).

**Coordination.** The project sponsor received approval from the Pennsylvania Department of Environmental Protection (PADEP) for the rehabilitation work and pumping test. PADEP's existing Public Water Supply (PWS) permit for Well 4 authorizes a permitted rate of 750 gpm. The project sponsor is not requesting an increase above PADEP's permitted rate. Therefore, PADEP's existing permit is still valid. The project sponsor is planning to submit a PWS permit application to PADEP in the future to address water quality issues. Commission staff has coordinated with the PADEP's Southcentral Region Office during review of the project, and PADEP staff has reviewed this docket for consistency with its requirements.

## Findings

The project is subject to Commission approval and reporting requirements, as per Commission Regulation §803.43.

Pumping test results indicate that Well 4 draws water from the Manheim-Lititz-Ephrata carbonate aquifer in the large valley to the west-northwest of Well 4. Pumping at an average rate of 750 gallons per minute (gpm), total drawdown in Well 4 was approximately 134 feet. Three wells in this area exhibited drawdown that ranged from approximately 1.5 to 6.6 feet. Commission staff finds that no adverse impact to these wells will result from the operation of Well 4 at the requested withdrawal rate.

Well 4 is located on the edge of a carbonate aquifer flow system having an area of approximately 50 square miles. Based on the groundwater availability analysis performed by the project sponsor and other data reviewed by the Commission, Commission staff finds that the resource is sufficient to support the requested withdrawal without adverse impacts to the regional aquifer or lowering the local water table.

The area contributing water to the well, as delineated by the consultant, includes an approximately 4,000-foot reach of Cocalico Creek north of Well 4. Commission staff's analysis indicates that the loss of streamflow caused by the proposed withdrawal represents less than 10 percent of the 7-day 10-year low flow (Q7-10 flow). Further, the project sponsor's wastewater treatment plant outfall returns treated water to Cocalico Creek upstream of the losing stream reach. Commission staff concludes that the Well 4 withdrawal will not adversely impact flow or habitat in Cocalico Creek.

The Borough of Akron (Akron) expressed concerns about possible adverse effects to their Roland Park well field from the proposed withdrawal. Commission staff considered the potential for adverse impacts to Akron during its review of the pumping test plan and required additional monitoring to address these issues. Streamflow and water levels in the shallow aquifer monitored at two locations between Well 4 and Akron's well field, and these were not impacted during the Well 4 test. Water levels in five of Akron's wells and the flow in the Akron Spring were unaffected by the Well 4 testing.

Test-induced drawdown occurred only in wells to the west and north of Well 4, in the Manheim-Lititz-Ephrata carbonate aquifer. No drawdown was observed in wells drilled in the Cocalico Formation or New Oxford Formation to the south and east. These results indicate that the phyllitic shales and siltstones of the Cocalico Formation form a low permeability barrier between Well 4 and Akron's well field. The Cocalico Formation is one of the lowest permeability aquifers in the Susquehanna River Basin, so this result is not unexpected. Further, the results of the pumping test suggest that the fault that passes from the Manheim-Lititz-Ephrata carbonate aquifer, past Well 4, through the Cocalico Formation hills and into Akron's well field is not a high permeability path through the Cocalico Formation hills.

Likewise, Commission staff finds that precipitation did not interfere with the evaluation of the test results. There were 0.61 inches of precipitation four days before the start of pumping,

and 0.59 inches of precipitation starting 11 hours after the completion of the pumping phase, and extending over an approximately 30-hour period. The events are discernable as very subtle water level rises of only a few tenths of a foot in the other monitored wells and neither event is discernable in the hydrograph for Well 4. Although precipitation was above normal throughout 2003, it was near normal for the three weeks prior to the pumping test. Groundwater levels were either stable or in recession prior to the start of testing. A minor rise in groundwater levels occurred at some observation points near the time of the start of pumping, due apparently to slight recharge from snowmelt. However, this fluctuation was minor and did not interfere with interpretation of the test data.

Based on these results, Commission staff concludes that the operation of Well 4 will not impair or cause a loss a capacity to the wells and spring in the Akron Borough's Roland Park well field.

Commission staff recommends approval of a 30-day average withdrawal of 1.08 mgd from Well 4. Commission staff recommends approval of a peak instantaneous pumping rate of 750 gpm for Well 4, the pumping rate used during the pumping test.

Commission staff recommends that the project sponsor keep daily records of the metered withdrawal and weekly recording of the water level, and these data should be submitted to the Commission annually.

A projection of the drawdown for a period of 90 days with no recharge indicates a pumping water level of approximately 204 feet, dewatering 7 of 15 logged water-bearing zones. However, the well log indicates that approximately 82 percent of the yield is obtained from the 4 water-bearing zones below 500 feet. Therefore, staff recommends that the pumping water level not be allowed to exceed 500 feet to prevent the collapse of the water-bearing zones.

The project is subject to the Commission's water conservation requirements, as per Commission Regulation §804.20(a). The water system is 100 percent metered, which is in compliance with this regulation, and the system had an unaccounted-for water loss of 14 percent in 2002, which is less than the 20 percent maximum set forth in Commission Regulation §804.20(a)(1).

The project sponsor has paid the appropriate application fee, in accordance with Commission Regulation §803.28, and in accordance with Commission Resolution 98-19, as amended by Commission Resolution 2000-06. The project sponsor has provided all proofs of notification, as required by Commission Regulation §803.25.

No adverse impacts on other area groundwater withdrawals and on the environment are anticipated. The project is physically feasible, does not conflict with or adversely affect the Commission's comprehensive plan, and does not adversely influence the present or future use and development of the water resources of the basin.

## Decision

The foregoing findings are hereby adopted and shall be incorporated into and made a part of this decision. The project's groundwater withdrawal of 1.08 mgd (30-day average) from Well 4 is approved pursuant to Article 3, Section 3.10 of the Compact subject to the following conditions:

a. The project sponsor shall comply with all Commission regulations, including groundwater withdrawal reporting requirements, as per Commission Regulation §803.43.

b. Within sixty (60) days from the date of this approval, the project sponsor shall install and maintain metering on Well 4, accurate to within five (5) percent, to measure its groundwater withdrawal. The project sponsor shall keep daily records of the metered withdrawal and weekly water levels from Well 4. The required reporting data shall be submitted to the Commission annually, and as otherwise required. Monitoring reports are due within sixty (60) days after the close of the preceding year. The Commission reserves the right to inspect all measurement equipment and audit all measurement records.

c. The maximum instantaneous rate of production from Well 4 shall not exceed 750 gpm.

d. The pumping water level in Well 4 shall not exceed 500 feet bgs.

e. The project sponsor shall comply with the water conservation requirements specified in Commission Regulation §804.20(a).

f. If the Commission determines that the operation of the project's groundwater withdrawal from Well 4 adversely affects any existing groundwater or surface water withdrawal, the project sponsor shall be required to provide, at its expense, an alternate water supply or other mitigating measure.

g. Commission approval shall not be construed to exempt the project sponsor from obtaining all necessary permits and/or approvals required for the project from other federal, state, or local government agencies having jurisdiction over the project. The Commission reserves the right to modify, suspend, or revoke this action if the project sponsor fails to obtain or maintain such approvals.

h. The Commission reserves the right to inspect or investigate the project facility, and the project sponsor shall allow authorized employees or agents of the Commission, without advance notice or a search warrant, at any reasonable time and upon presentation of appropriate credentials, and without delay, to have access to and to inspect all areas where the project is being constructed, operated, or maintained. Such employees or agents shall be authorized to conduct tests or sampling, to take photographs, to perform measurements, surveys, and other tests, to inspect the methods of construction, operation, or maintenance, to inspect all measurement equipment, to audit, examine, and copy books, papers, and records pertinent to any matter under investigation, and to take any other action necessary to assure that the project is

constructed, operated, or maintained in accordance with the terms and conditions of this approval or any other rule, regulation, or order of the Commission.

i. If the project sponsor fails to comply with the provisions of the Compact or any rule, regulation or order of the Commission, or any term or condition of this docket, the Commission may suspend, modify, or revoke its approval of same, and may impose appropriate fines and penalties. Upon written notice by the Commission, the project sponsor shall have thirty (30) days to correct such noncompliance, unless an alternate period is specified in the notice. Nothing herein shall preclude the Commission from exercising its authority to immediately modify, suspend, or revoke this approval where it determines exigent circumstances warrant such action, or from imposing fines and penalties, regardless of the period of noncompliance.

j. The Commission reserves the right to reopen any project docket or issue such additional orders, as may be necessary, to mitigate or avoid adverse impacts or otherwise to protect public health, safety, welfare, or the environment.

k. Commission approval confers no property rights upon the project sponsor. The securing of all rights necessary and incident to the project sponsor's development and operation of the project shall be the sole and exclusive responsibility of the project sponsor, and this approval shall be subject thereto.

l. This approval is effective until September 8, 2029. The project sponsor shall submit a renewal application by March 8, 2029, and obtain Commission approval prior to continuing operation beyond September 8, 2029.

m. If the project is discontinued for such a period of time and under such circumstances that an abandonment of the project may reasonably be inferred, the Commission may rescind the approval of the project unless a renewal is requested by the project sponsor and approved by the Commission.

By the Commission:

Dated: September 8, 2004



Kendl P. Philbrick, Chair  
Maryland Commissioner