

LimerickNPEm Resource

From: Stoller, Ken [Ken.Stoller@drbc.state.nj.us]
Sent: Friday, June 08, 2012 1:36 PM
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Subject: Revised draft LGS Docket
Attachments: image001.gif; 1969-210 20CP-13_Exelon_LGS_060612.doc

Chris,

Attached is the revised draft of the LGS docket. Changes have been made based on our review of your comments sent on the May 3, 2012 and our meeting on June 6, 2012. At the meeting it was agreed that you will provide clarifying language to the paragraph on page 14 and Condition II. ww. In addition you will provide a revised Operation Manual. As we discussed our target date to go to public notice is at the end of this month with the public hearing on August 28, 2012.

Ken

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This DRAFT Docket has been prepared for the purposes of the scheduled public hearing and may be substantially modified as a result of the public hearing process prior to Commission action.

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DOCKET NO. D-1969-210 CP-13

DELAWARE RIVER BASIN COMMISSION

**Exelon Generation Company, LLC
Limerick Generating Station and Surface Water Augmentation
Montgomery, Bucks, Schuylkill, Berks and Chester Counties, Pennsylvania**

PROCEEDINGS

This docket is issued in response to an Application submitted to the Delaware River Basin Commission (DRBC or Commission) by Exelon Generation Company, LLC (Exelon Generation or docket holder) regarding the Limerick Generating Station (LGS) on September 17, 2007 (Application), for renewal with modifications of the Commission's prior approvals of water resource operations at the docket holder's nuclear power station.

The Application was reviewed for continuation of the project in the Comprehensive Plan and approval under Section 3.8 of the *Delaware River Basin Compact*. The Bucks, Montgomery, Berks, Schuylkill, Chester and Philadelphia County Planning Commissions have been notified of pending action. In response to the public interest concerning this Application, a public hearing on this project was held by the DRBC in Pottstown, PA on **XXXX, YY, 2012**.

A. DESCRIPTION

1. **Purpose.** The purpose of this docket is to act on the Application request to convert the prior demonstration projects to normal project operations and to renew and modify existing dockets. In addition, the Commission is combining all prior LGS-related approvals into a single comprehensive docket. The docket holder has requested docket modifications to provide long-term approval of operations and surface water withdrawals from the Schuylkill River, the Perkiomen Creek, the Delaware River, the Wadesville Mine Pool (WMP) and the Tamaqua Area Water Authority's (TAWA) Still Creek Reservoir and Owl Creek Reservoirs to supply the consumptive and non-consumptive cooling water needs at LGS. Based on the experiences gained during the Water Supply Modification Demonstration Project and the WMP Withdrawal

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and Streamflow Augmentation Demonstration Project conducted in accordance with prior docket approvals, the docket holder has requested the approval of those operations with proposed modifications. The docket holder has also requested that the limit for the releases from the TAWA's Still Creek Reservoir and Owl Creek Reservoirs to augment the Schuylkill River flow for the purpose of the LGS consumptive use operations be increased from 36.0 million gallons per day (mgd) to 45.3243.3 mgd (44.42 mgd plus 3% for evaporative losses).

This docket also approves a surface water discharge to the Schuylkill River of up to 14.2 mgd consisting primarily of blowdown from the LGS facility.

There are two attachments associated with this docket.

Attachment No. 1 consists of the *LGS System Map*.

Attachment No. 2 consists of the *Operation and Monitoring Plan* (O&M Plan)

Exelon Generation has submitted an O&M Plan for the Limerick Generating Station Water Supply Program (O&M Plan - Attachment 2). The O&M Plan includes withdrawals from the Schuylkill River and Perkiomen Creek unaugmented, the Schuylkill River *augmentation* from the WMP and TAWA's Still Creek Reservoir and Owl Creek Reservoirs, and Perkiomen Creek *augmentation* via water diverted from the Delaware River. The O&M Plan has been subject to DRBC and Pennsylvania Department of Environmental Protection (PADEP) review and has been available for public review. The O&M Plan also provides for the collection of data and analysis to determine the project's compliance with the terms of this docket. For the purpose of this docket, *augmentation water* refers to water supplied by Exelon Generation from DRBC-approved sources to the Schuylkill River and Perkiomen Creek during periods of low natural stream flow to compensate for LGS ~~consumptive cooling surface~~ water withdrawals ~~during periods of low natural stream flow for consumptive use~~. Schuylkill River *augmentation water* is supplied from the WMP and/or Still Creek Reservoir and Owl Creek Reservoirs, and Perkiomen Creek *augmentation water* is supplied from the Delaware River via the water diversion system. *Augmentation water* also may be used for LGS non-consumptive use only under limited circumstances set forth in this docket. Natural flow refers to the naturally-occurring flow in the source waterbody not augmented by releases from Commission sponsored reservoir storage projects (Blue Marsh).

The Commission has instituted a revised method to specify allocation quantities. The method allocates a volume of water (typically in million gallons) on a monthly basis using a 31-day month (mgm), as opposed to a rolling 30-day average. The allocations included in this docket reflect this method. Previous Commission allocations for LGS restricted the daily withdrawal of water from the Schuylkill River to 56.2 mgd (42 mgd consumptive plus 14.2 mgd non-consumptive). Based on a 31-day monthly allocation, this equates to an allocation of 1.7422 billion gallons per month (bgm). This docket approves an increase in the peak daily withdrawal from the Schuylkill River from 56.2 mgd to 58.2 mgd (44 mgd consumptive plus 14.2 mgd non-

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consumptive), however, this docket restricts the maximum monthly withdrawal to 1.7422 bgm (See FINDINGS Section).

This docket also approves the following groundwater withdrawals:

- LGS Well 1 (the “Alley Well”): up to 0.104 mgd (3.1 mgm)
- LGS Well 3 (the “Batch Plant Well”): up to 0.094 mgd (2.8 mgm)
- Limerick Training Center Well: up to 0.075 mgd (0.1 mgm)
- Limerick Energy Information Center Well: up to 0.044 mgd (0.1 mgm)

This docket restricts the total system groundwater withdrawal allocation to up to 6.1 mgm. The wells supply potable, non-potable, and emergency use water to the LGS and associated buildings. During fire emergencies and other plant emergencies, groundwater withdrawals are not restricted.

This docket also approves the use of the various water sources subject to the conditions and requirements contained in the DECISION Section of this docket.

2. Location and Physical Features. The overall project consists of multiple release, withdrawal and discharge components in different locations. Attachment No. 1 is a system map that depicts the locations and interrelationship of these components. Specific coordinates of the withdrawal and intake points have not been provided in this docket for security purposes.

a. Limerick Generating Station (LGS): The project includes the continued operation of a nuclear power plant with two generating units each having a maximum Reactor Thermal Power of 3,515 megawatts, with circulating cooling water for the steam turbine condensers to be furnished from cooling towers and surface water to be withdrawn from the Schuylkill River and/or Perkiomen Creek as described below. LGS is located on a 491-acre site adjoining the east bank of the Schuylkill River mostly in Limerick Township (a small portion extends into Lower Pottsgrove Township), Montgomery County, Pennsylvania, about 1.7 miles south of the nearest part of the Borough of Pottstown. The LGS site property also includes 154 acres adjoining the west bank of the Schuylkill River in East Coventry Township, Chester County. No plant features of LGS are situated in this area; it serves only as the western portion of the LGS exclusion area. Water intake structures and discharge structures associated with the facility and its operations are described below. The main facilities at the site include two reactor enclosures, two turbine enclosures, two hyperbolic cooling towers, administrative and service buildings, an Independent Spent Fuel Storage Installation (ISFSI), and a water treatment building. The addition of the ISFSI was completed in February 2008.

b. LGS Schuylkill River Intake (Withdrawal Location): The primary LGS intake is located in Limerick Township, Montgomery County, Pennsylvania on the non-tidal portion of the Schuylkill River. The facility is located at River Mile 92.47 - 48.22 (Delaware River –

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Schuylkill River). Specific location information for this water withdrawal location has been withheld for security reasons.

Water withdrawn through the Schuylkill River intake (“Schuylkill Pumphouse”) is used for consumptive and non-consumptive applications at LGS. The water enters the front and sides of the intake structure through trash bar racks, passes through intake bays and traveling screens, and then flows into the pump wells. The LGS intake is designed to limit the velocity of the water approaching the traveling screens to a maximum of 0.61 feet per second (fps).

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c. **LGS Perkiomen Creek Intake (Withdrawal Location):** The auxiliary LGS intake is located in Graterford Township, Montgomery County, Pennsylvania on the Perkiomen Creek. The facility is located at River Mile 92.47 – 32.36 – 8.53 (Delaware River – Schuylkill River – Perkiomen Creek). Specific location information for this water withdrawal location has been withheld for security reasons.

Exelon Generation is approved to withdraw water from Perkiomen Creek for use at LGS when its 24-hour average natural flow is at least 180 cfs (for one unit in operation) or 210 cfs (for two units in operation) as measured at the U.S. Geological Survey (USGS) Graterford gaging station, and the use of the Schuylkill River is limited or restricted.

Subject to the flow restrictions as defined in DECISION Condition II.ee. of this docket, the approval to withdraw water from the Perkiomen Creek [via natural flow or after augmentation from the Delaware River (intrabasin transfer)] also applies when the natural flow criteria for the Schuylkill River are met provided that (1) an abnormal condition exists that prevents withdrawal from the Schuylkill River (e.g., the Schuylkill Pumphouse is out of service, an ice jam on the river prevents withdrawal, or an upstream spill causes severe intake water quality impairment which could result in equipment damage); (2) a plant operational/maintenance condition exists that could be mitigated by the selective use of Perkiomen Creek water (e.g., using Perkiomen Creek water that contains less total dissolved solids than Schuylkill River water when a condenser chemistry issue is detected and until such issue can be resolved); or (3) LGS has already switched over to using the Perkiomen Creek intake when use of the Schuylkill River is restricted, but the Schuylkill River flow then cycles between meeting and not meeting its flow criteria, which would otherwise require LGS to repeatedly start up and shut down both intake pumphouses within a relatively short period of time (See DECISION Condition II.ee).

The Perkiomen Creek intake consists of a pumphouse (“Perkiomen Pumphouse”) and in-stream components that consist of a series of 15 submerged stationary slotted screens, placed at midstream in the Perkiomen Creek and connected to three intake pipelines. The screens are cylindrical, each approximately 6 feet long and 2 feet in diameter, with a slot size of 2 mm. The average through-slot velocity is less than 0.4 fps; maximum through-slot velocity is less than 0.5 fps. The water passes through the screens and the three intake pipelines connected to the onshore pumphouse. The pumphouse contains three 50% capacity intake pumps and a small (approximately 400 gpm) auxiliary pump. Shallow weirs located in the creek just downstream of

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the Perkiomen intake maintain a pool level above the submerged screens. The intake and its associated discharge pipeline to LGS are used to supply water from the Perkiomen Creek to LGS. The water discharges into a storage tank located at the LGS plant site for subsequent use.

Exelon Generation also is approved to use Perkiomen Creek water to supply the small auxiliary pump, which operates as needed to: (1) maintain system operability by keeping the discharge pipelines and storage tank sufficiently full to prevent water hammer when the intake pumps are started; (2) maintain level in the storage tank when the system is not in use; and (3) provide freeze protection by agitating the storage tank water during frigid weather conditions.

d. Wadesville Mine Pool (Release Location): During periods when the flow criteria for the Schuylkill River are not met, Exelon Generation is approved to use water from the WMP to augment flow in the Schuylkill River and to withdraw an equivalent amount (minus evaporative losses), to be used by Exelon Generation as *augmentation* water for LGS. Up to 446.4 mgm (14.4 mgd, 10,000 gpm) of water may be used to augment the Schuylkill River for this purpose. The pumping and conveyance system currently used to maintain the water level of the WMP, which is located on Reading Anthracite Company (RAC) property, is located at the border of New Castle and Norwegian Townships, just west of St. Clair Borough, all within Schuylkill County, Pennsylvania.

The Wadesville anthracite minefield is located in the Llewellyn Formation and there are no active deep mines in or near the area. The Wadesville Operation extends for approximately 2,000 acres in the Townships of Norwegian and New Castle and the Borough of St. Clair, all within Schuylkill County in Pennsylvania.

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The WMP and the dewatering pumps have been operational for approximately 50 years. The WMP is approximately 700 feet deep, one mile wide and three miles long. An estimate of the amount of water stored in the mine pool (3.6 billion gallons) was determined in 1953. The WMP withdrawal has been reviewed and approved by PADEP. In accordance with a DRBC and PADEP (successor to Pennsylvania Department of Environmental Resources) Administrative Agreement dated August 19, 1976, mine drainage projects are deemed to not have a substantial effect on the water resources of the Delaware River Basin for the purposes of the agreement. Under the terms of the 1976 agreement, DRBC will have no further involvement in the technical review of such projects unless a request for assistance is made to DRBC by PADEP. In accordance with the 1976 agreement, DRBC is only approving the use of the water for the purposes of augmentation.

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The existing pump house, which is located at the Wadesville shaft approximately ¼-mile from the open pit, contains pumping equipment used for dewatering of the mine pool to support present-day operations. The top of the shaft is at elevation 782 feet above mean sea level (MSL) and its bottom elevation is at 46 feet MSL. Two vertical turbine pumps operate, as available, to maintain the water level at approximately 450 feet (El 332 feet MSL) below the surface. The bottom of the casing of the lower pump is approximately 600 feet (El 182 feet MSL) below the

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surface. The pumps are capable of discharging at a rate in the range of 9,000 to 10,000 gpm total.

Information published in a 1953 bulletin by the Bureau of Mines states that the:

- Surface elevation at Wadesville is at El 821.2 feet MSL;
- Elevation of the Pool Bottom is El 65 feet MSL;
- Overflow elevation at a concrete pipe at the Saint Clair shaft is El 732 feet MSL; and
- Estimated water in the workings is 3.6 billion gallons (in 1953).

The WMP facilities are found on the “Pottsville, PA” USGS Quad as follows:

FACILITY	LATITUDE (N)	LONGITUDE (W)
Wadesville Pump House	40° 42' 55"	76° 12' 22"
Wadesville Outfall	40° 42' 52"	76° 12' 24"

The existing outfall is used to discharge mine pool water via a dry swale to the East Norwegian Creek in the Schuylkill River Watershed. East Norwegian Creek joins with West Norwegian Creek to form Norwegian Creek, which flows under the Borough of Pottsville, via a culvert, to join the Schuylkill River at River Mile 123.4. The WMP water is discharged at River Mile 92.47 - 123.4 - 2.4 - 0.5 (Delaware River – Schuylkill River – Norwegian Creek – East Norwegian Creek) in accordance with National Pollutant Discharge Elimination Discharge Permit System (NPDES) Permit Nos. PA00593508 and PA0123293, renewed by PADEP on April 4, 2008 and December 21, 2007, respectively. The NPDES permits for the WMP discharges are issued to Reading Anthracite Company (Pottsville, PA). In accordance with the existing administrative agreement between PADEP and DRBC, PADEP is responsible for the issuance of permits for the discharge from the mine operations.

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The PADEP submitted the *Total Maximum Daily Load (TMDL) Report for the Upper Schuylkill River Watershed* to the United States Environmental Protection Agency (EPA) on March 28, 2007. The report included TMDLs for the three primary metals associated with acid mine drainage (AMD) (iron, manganese, and aluminum) and pH, and addressed three segments of the Schuylkill River on Pennsylvania's 1996 303(d) list of impaired waters. On April 7, 2007, the EPA approved the TMDL. Both NPDES permitted discharges from the Wadesville site are included in the TMDL.

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e. Delaware River Diversion (Withdrawal Location): During periods when use of the Perkiomen Creek is allowed and the flow criteria for the Schuylkill River and the Perkiomen Creek are not met, Exelon Generation is approved to use an intrabasin transfer of water from the Delaware River to the Bradshaw Reservoir for subsequent release (augmentation) into the East Branch Perkiomen Creek (EBPC). The released water then flows into the Perkiomen Creek and reaches the point of withdrawal at the Perkiomen Creek intake, where it is

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pumped to LGS. Docket No. D-1965-76 CP (8) approves the diversion of Delaware River water into the Bradshaw Reservoir. Docket No. D-79-52 CP approves the pumping of water from the Bradshaw Reservoir into the EBPC. –Docket D-79-52 CP limits the maximum quantity pumped by the Bradshaw Reservoir Pumping Station to the EBPC for -PECO (now Exelon Generation) to 42 mgd plus -a ten percent allowance for evaporative and leakage losses in the open channel of the connecting waterways or a total of 46.2 mgd. The attached O&M Plan provides that when water is pumped from the Bradshaw Pumping Station for Exelon Generation use as consumptive use at LGS an additional 310% of the amount pumped will be added for evaporative and leakage losses in the open channel of the connecting waterways. –If in the future Exelon Generation provides written documentation to support an increase in the 310% to allow for a increase decrease in the losses in the connection waterways, and the Executive Director approves such a request; or the Executive Director determines independently that the 310% should be increased/decreased, the Executive Director may approve an increase-decrease in the 310%, but not to exceed 10% below 3%.

The diversion of water from the Delaware River for LGS consumptive cooling water needs is accomplished through a series of pumping stations, the Bradshaw Reservoir, transmission mains, the EBPC and Perkiomen Creek. The Point Pleasant Pumping Station is located at Delaware River Mile 157.3 in Plumstead Township, Bucks County, Pennsylvania, and is owned and operated by Forest Park Water Authority (FPWA). Specific location information for this water withdrawal location has been withheld for security reasons.

Docket No. D-65-76 CP (8) was approved on February 18, 1981 with no expiration date. The docket approves a total diversion from the Delaware River of 95 mgd. Of the 95 mgd:

- Up to 48.8 mgd (39.5 mgd for public water supply purposes plus 4 mgd for evaporative and seepage losses and up to 5.3 mgd is provided to maintain the minimum stream flows in the Neshaminy Creek downstream of the water treatment plant); and,
- Up to 46.2 mgd (42 mgd for LGS consumptive losses + 10% for evaporative losses in the open channel of the connecting waterways).

The original approval was issued to the Neshaminy Water Resources Authority (NWRA) but a change of ownership occurred in 1994, transferring the docket from the NWRA to the FPWA. The portion of the FPWA diversion for Exelon Generation's is pumped from the Delaware River for discharge into the Bradshaw Reservoir. The remaining portion for local public water supply purposes (up to 48.8 mgd) is pumped from the Delaware River for discharge through the Bradshaw Reservoir to the North Branch Neshaminy Creek.

The Bradshaw Reservoir, pumping station, and transmission main were approved by DRBC via Docket No. D-79-52 CP on February 18, 1981. Docket No. D-79-52 CP does not have an expiration date. The Bradshaw Reservoir facility, which is owned and operated by Exelon Generation, includes a pumping (booster) station that is used to transfer water, when

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required, to the EBPC through a transmission main for Exelon Generation's use. The water is disinfected seasonally, as required by PADEP NPDES Permit No. PA0052221 (effective July 1, 2009), before it reaches the EBPC by mixing with ozone at Exelon Generation's water treatment plant (the "Bedminster Water Processing Facility" or BWPF), which is located along the transmission main route. The transmission main and BWPF also are owned and operated by Exelon Generation.

Condition II.P. of Docket No. D-79-52 CP reserves the right of the Commission to open said docket at any time, and to reconsider its decision and any and all conditions imposed hereunder in light of further information developed by, or decisions rendered in, pending or future proceedings conducted by other State and Federal agencies concerning the development and operation of LGS and related facilities. Condition II.P. also allowed the Commission to, at any time, modify existing conditions, or impose additional conditions, upon the construction and operation of this facility to reflect new or changed information or to conform to requirements imposed on the project by other agencies. By approval of this docket, the Commission is modifying one of the DECISION Conditions of Docket No. D-79-52 CP as described in the next paragraph.

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DECISION Condition II.C. of Docket No. D-79-52 CP required PECO (Exelon Generation's predecessor) to maintain 27 cfs in the EBPC while LGS was in operation and 10 cfs at all other times. By approval of this docket, the Commission is modifying DECISION Condition II.C. of Docket No. D-79-52 to require a minimum flow of 10 cfs (6.5 mgd) in the EBPC at all times (See Condition II.gg.).

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The rate of release into the EBPC is equal to the LGS's consumptive cooling water demand plus an additional three percent (unless modified as discussed above, to compensate for evaporative losses estimated to occur during the approximately 18-hour transit time). The flow in the EBPC enters into the main branch of Perkiomen Creek and flows downstream to a point in the Graterford area, where Exelon Generation's Perkiomen Creek intake structure and transfer pipeline are used to convey the water directly to LGS.

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In accordance with Docket No. D-65-76 CP (8), the Point Pleasant Pumping Station may withdraw up to 95 mgd of water from the Delaware River. Up to 46.2 mgd (42 mgd consumptive use- at LGS plus 4.2 mgd for transmission losses) may be routed to the EBPC for use by Exelon Generation to maintain minimum creek flows, provide for recreational event augmentation, and provide for water withdrawals at the Perkiomen Creek intake at Graterford, Pennsylvania. At Graterford, up to 42 mgd of water may be pumped to LGS for consumptive use.

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Water diverted from the Delaware River via the Point Pleasant Pumping Station is restricted to the use, conditions and service area approved in Docket No. D-65-76 CP (8) (approved on February 18, 1981) and by DECISION Condition II.ii. of this docket, and cannot be used for any other purposes unless approved by the Commission. Docket versions D-65-76

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CP-9 and D-65-76 CP-10 covered additional items primarily related to Forest Park Water. Docket version D-65-76 CP-8 remains in effect and unchanged by the subsequent docket versions.

f. **TAWA's Still Creek Reservoir and Owl Creek Reservoirs** (Release Location): During periods when the natural flow criteria for the Schuylkill River are not met, Exelon Generation is approved to use water from Still Creek Reservoir as Schuylkill River *augmentation* water and to withdraw an equivalent amount (minus evaporative losses) for consumptive use at LGS. Exelon Generation has a contract with TAWA for compensatory releases of water from Still Creek Reservoir into Still Creek. Still Creek Reservoir is located in Rush Township, Schuylkill County, Pennsylvania, approximately 2.3 miles north of Hometown, Pennsylvania and 5,000 feet upstream from the confluence of Still Creek and the Little Schuylkill River at River Mile 92.47 - 102.1 - 30.15 - 1.0 (Delaware River – Schuylkill River – Little Schuylkill River – Still Creek).

Releases from Still Creek Reservoir are approved for use by Exelon Generation to augment the Schuylkill River to meet up to 36 mgd of LGS's consumptive use demands (less in transit evaporative losses) when the Schuylkill River is unavailable due to withdrawal restrictions as required in this docket. The docket holder requested in its application that the limit for the releases from the TAWA's Still Creek Reservoir to augment the Schuylkill River flow for the purpose of the LGS consumptive use operations be increased from 36.0 mgd to 45.3243.3 mgd (i.e., 44.42 mgd plus a three percent allowance for in-transit evaporative losses).

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DRBC issued Entitlement No. 311 to the Tamaqua Borough Authority (TBA) on August 6, 1976. The Entitlement confirmed that TBA could use, withdraw or divert up to 38.044 million gallons per month for consumptive use and 205.156 million gallons per month for non-consumptive use without being subject to DRBC surface water charges. The Commission staff is currently reviewing the application from TAWA (TBA's successor) was received by the Commission on July 6, 2010. Until such time as the Commission makes its determination regarding the TAWA application, the releases from Still Creek Reservoir are approved for use by Exelon Generation to augment the Schuylkill River to meet up to 36 mgd of LGS's consumptive use demands (less in transit evaporative losses). (See DECISION Condition II.jj.)

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The Commonwealth of Pennsylvania Department of Forests and Waters, Water and Power Resources Board (currently PADEP) issued Water Allocation No. WA-626 to the TBA on January 5, 1965. The permit allocated 8 million gallons per day from Still Creek (248 mgm) for public water supply purposes. The permit, which involves public water supply diversions and is not related to releases on behalf of LGS, expires on January 5, 2015.

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The docket holder has also requested the approval to use releases TAWA's Owl Creek Reservoirs in combination with releases from TAWA's Still Creek Reservoir for up to 36 mgd (and eventually 43.3 mgd) for augmentation purposes. The Owl Creek Reservoirs are located in

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Borough of Tamaqua, Schuylkill County, Pennsylvania. The existing dams are located at River Miles 92.47 – 102.1 – 22.1 – 1.7 and 92.47 – 102.1 – 22.1 – 2.3 (Delaware River – Schuylkill River – Little Schuylkill River – Owl Creek). Due to their close proximity to one another, the two Owl Creek Reservoirs are assumed to function as a single reservoir of combined capacity. The use of releases from Owl Creek Reservoirs in conjunction with Still Creek releases were approved by the Commission until Docket Revision 12, when it was reported that the Owl Reservoirs were removed from operation due to operational complications. The Owl Creek Reservoirs are currently undergoing rehabilitation and are expected to be back in service within the next year. The use of water released from TAWA's Owl Reservoirs in combination with TAWA's Still Creek Reservoir as augmentation water and use at LGS is contingent upon: TAWA amending its current application or applying separately for the Owl Creek Reservoirs; separate Commission review and approval of the application by TAWA for the reservoir and water supply system and a consequent finding of "no significant impact to the water resources of the basin"; and the written approval by the Executive Director. (See Condition jj.)

g. LGS Outfall 001 (Discharge Location): LGS's Outfall 001 discharges primarily cooling tower blowdown, with intermittent additions of wastewater from the spray pond, holding pond, and liquid radwaste treatment systems, including laundry drains.

Liquid radioactive wastes are handled by systems enclosed within the protected area of the plant. These systems comprise the LGS radioactive liquid waste management system, which collects, treats, stores, and disposes of radioactive liquid wastes. The wastes are collected in sumps and drain tanks at various locations throughout each Limerick Unit and then transferred to the appropriate collection tanks in the common radwaste enclosure according to their classification (i.e., equipment drain, floor drain, chemical drain, or laundry drain waste). The liquid wastes are processed through treatment units to reduce radionuclide concentrations and are then either returned to the condensate system for re-use in the plant, packaged for offsite shipment, or monitored and discharged from the plant into the cooling tower blowdown line on a batch basis. The mixing of the effluent with the blowdown flow maintains the radionuclide concentrations at the release point in the Schuylkill River below 10 CFR Part 20 limits. Radionuclide effluents are under the jurisdiction of the U.S. Nuclear Regulatory Commission (NRC). Exelon Generation prepares and submits an Annual Radiological Environmental Operating Report for LGS to the NRC that assesses calculated offsite dose data resulting from radioactive liquid effluents. The Commission is deferring to the effluent limitations as prescribed by the NRC and as included in the LGS NPDES permit which specifies the effluent discharge requirements each specify an effluent discharge rate for Outfall 001 for this parameter.

LGS's Outfall 001 discharge structure is a multi-port diffuser. Wastewater is returned to the Schuylkill River through the discharge diffuser, which is encased in the concrete channel stabilization structure on the east side of the river, about 700 feet downstream of the intake. The discharge diffuser consists of a 28-inch carbon steel pipe with a total of 283

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nozzles (1.25 inch diameter) installed on 6-inch centers. The diffuser is supplied by a 36-inch carbon steel cooling tower blowdown pipe.

The LGS Outfall 001 discharges at River Mile 92.47 – 48.01 (Delaware River ← Schuylkill River) in accordance with the NPDES renewal Permit No. PA0051926, which is being processed concurrently by PADEP with this docket.

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LGS Outfall 001 is found on the “Phoenixville, PA” USGS Quad as follows:

FACILITY	LATITUDE (N)	LONGITUDE (W)
LGS Outfall 001	40° 13' 13"	75° 35' 22"

No changes in the location or capacity of any of the facilities described above are necessary to implement the requirements provided for in this docket. All existing facilities of the LGS project remain as previously approved. Intake water to the docket holder’s facilities and discharges from Outfall 001 are metered. No new facilities are proposed.

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3. Design Criteria. Exelon Generation is approved to withdraw water to meet its consumptive and non-consumptive needs at LGS in accordance with the Conditions in the DECISION Section of this docket and the O&M Plan approved by this docket. The following generally describes those conditions:

A. Surface Water Withdrawals from the Schuylkill River:

i. UNAUGMENTED:

- Surface water withdrawals from the Schuylkill River shall not exceed 58.2 mgd (44 mgd consumptive plus 14.2 non-consumptive) and 1.7422 bgm to supply the consumptive and non-consumptive needs of LGS.
- With one unit in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **greater than 530 cfs**, the **unaugmented** surface water withdrawal for consumptive use is restricted to 24 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm.
- With two units in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **greater than 560 cfs**, the **unaugmented** surface water withdrawal for consumptive use is restricted to 44 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm.

ii. AUGMENTED:

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- With one unit in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **less than or equal to 530 cfs**, the **augmented** surface water withdrawal for consumptive use is restricted to 24 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm. All consumptive use will be augmented on a 1:1 gallons per day (gpd) basis.
- With two units in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **less than or equal to 560 cfs**, the **augmented** surface water withdrawal for consumptive use is restricted to 44 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm. All consumptive use will be augmented on a 1:1 gpd basis.

B. Schuylkill River Augmentation Water Sources (WMP and TAWA's Still Creek Reservoir and Owl Creek Reservoirs)

- Exelon Generation may use the WMP and TAWA's Still Creek Reservoir ~~System~~ to provide *augmentation water* to the Schuylkill River to meet LGS's consumptive use demands as identified above at times when the 24-hour average flow in the Schuylkill River as measured at the Pottstown gaging station is less than or equal to 530 cfs with one unit in operation and 560 cfs with two units in operation. All consumptive use will be augmented on a 1:1 gpd basis.
- Up to 446.4 mgm (14.4 mgd) of water may be used to augment the Schuylkill River from the WMP.
- Up to 36 mgd and 1.116 bgm may be used to augment the Schuylkill River from TAWA's Still Creek Reservoir. Upon written approval from the Executive Director in accordance with DECISION Condition II.jj. of this docket, this amount may be increased from up to 36 mgd and 1.116 bgm to up to 43.3 mgd -and- 1.342 bgm per month ~~by the written approval from the Executive Director.~~ Upon written approval of the Executive Director, the Owl Creek Reservoirs may be approved for augmentation releases and use at LGS in combination with Still Creek Reservoir.
- During augmentation from WMP, when Schuylkill River TDS concentrations reach 500 mg/l as indicated at the Landingville Gaging Station (USGS Gage No. 01468500), Exelon Generation is required to discontinue use of the WMP as an augmentation source (Condition II.nn.).

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C. Surface Water Withdrawals from Perkiomen Creek and Perkiomen Creek *Augmentation Water* Source (Water Diversion from the Delaware River to EBPC via Bradshaw Reservoir)

i. UNAUGMENTED:

- When use of the Schuylkill River is restricted, or when the Schuylkill River is unrestricted ~~and~~ under the specific conditions listed in Section A.2.c., paragraph two, of this docket, Exelon Generation may withdraw water from the unaugmented Perkiomen Creek for use at LGS at a rate of up to 24 mgd when its natural flow is at least 180 cfs (116 mgd) (with one unit in operation) or 42 mgd (65 cfs) when its natural flow is at least 210 cfs (136 mgd) (with two units in operation) as measured at the Graterford gaging station (USGS Gage No. 01473000) with the total not to exceed 1,302 bgm.

ii. AUGMENTED

- When use of the Schuylkill River is restricted, or when the Schuylkill River is unrestricted and under the specific conditions listed in Section A.2.c., paragraph two, of this docket, and the natural flow of the Perkiomen Creek is less than 180 cfs (with one unit in operation) or less than 210 cfs (with two units in operation), Exelon Generation may withdraw up to 42 mgd of water for the purpose of supplying the consumptive needs of LGS from the augmented Perkiomen Creek at Graterford, Pennsylvania. Perkiomen Creek *augmentation water* is routed from the Bradshaw Reservoir as part of the up to 46.2 mgd (71.5 cfs) pumped to the EBPC for conveyance to Graterford. This water, which is diverted from the Delaware River via the Point Pleasant Pumping Station, is restricted to the use, conditions and service area approved in Docket No. D-65-76 CP-8 and cannot be used for any other purposes unless approved by the Commission. All consumptive use will be augmented on a 1:1 gpd basis.
- In accordance with Condition III. a. of Docket D-1977-110 CP - Amendment 1 (Merrill Creek Owners Group or MCOG docket), "Compensation Releases", in lieu of curtailment, shall be made for all "Designated Units" listed in Table A of the MCOG docket whenever the Commission's Drought Management Plan (present or future) causes the flow objective at the Trenton gage to drop below 3,000 cfs and the "Equivalent Flow" at Trenton drops below 3,000 cfs. In addition, "Compensation Releases" will be required if and when the "Equivalent Flow" at Trenton drops below 3,000 cfs for five consecutive days due to reasons beyond the control of the DRBC. In accordance with Condition III. b. of the MCOG docket, "Designated

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Units” (LGS Units 1 and 2 are both “Designated Units”) shall be exempt from curtailment by the DRBC as long as the freshwater equivalent consumptive use resulting from the operation of the units is being replaced by “Compensation Releases” from the Merrill Creek Reservoir Project. However, such releases from the Merrill Creek Reservoir are not required for any portion released for LGS from the Still Creek Reservoir (See DECISION Condition II.hh.).

D. Minimum Flow in the EBPC

- Exelon Generation shall maintain a minimum flow of at least 10 cfs in the EBPC at all times in accordance with the O&M Plan. The docket holder shall develop recreational flow management plans to increase flows in the EBPC above 10 cfs to support specific short-term recreational events. The recreational flow management plan must be approved by the Executive Director in accordance with DECISION Condition II. ff. included in this Docket.

E. Emergency Use of Surface water

- During an emergency, if normal constraints on withdrawals cannot be met, the docket holder may use surface water from the sources, designated herein as necessary, to address the emergency until it has been stabilized, in accordance with the O&M Plan and/or emergency shutdown procedures established by the NRC. Notification of and consultation with the Executive Director should occur as soon as possible but no later than 24 hours after the emergency is known by the docket holder.

- In the event that conditions exist that require the water diversion system to be in service to supply water for LGS’s consumptive use, but the system is unavailable or of diminished capacity, an equal volume of water, up to 36.0 mgd (peak daily withdrawal) and 1.116 bgm, may be released from Still Creek Reservoir, subject to its Operating Rule Curve and allowing an additional three percent for in-transit evaporative losses, and withdrawn for consumptive use at LGS. Notification of such releases to the Commission should occur as soon as possible but no later than 48 hours after the event occurs. Upon written approval from the Executive Director, consistent with DECISION Condition II.jj. of this docket, the amounts may be increased from up to 36.0 mgd and 1.116 bgm to up to 43.3 mgd and 1.342 bgm, respectively. Upon written approval of the Executive Director, the Owl Creek Reservoirs may be approved for augmentation releases and use at LGS in combination with Still Creek Reservoir.

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Comment [BM1]: Exelon to provide language limiting the use during a 3 day operational transition to the Tamaqua supply. In addition Exelon will add language that provides for notification of downstream Schuylkill River surface water withdrawers.

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~~In order to minimize potential interruptions to base load generation of electricity from LGS that possibly could adversely affect the regional electricity supply grid, releases from Still Creek Reservoir also are approved for use by Exelon Generation as augmentation of the Schuylkill River to meet up to 36 mgd (peak daily withdrawal) and 1.116 bgm of LGS's consumptive cooling water needs when (1) flows in both the Schuylkill River and Perkiomen Creek are less than the minimum amounts for one Unit and two Unit operation; and (2) sufficient water diversion system capacity is unavailable. Such releases are subject to the reservoir Operating Rule Curve, must allow an additional three percent for in-transit evaporative losses, but are not subject to travel time requirements. Notification of the Commission should occur as soon as possible but no later than 48 hours after such use.~~

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Comment [BM2]: The need to meet the grid requirements do not supersede the need to protect the water resources. Exelon needs to explain the meaning of this paragraph – DRBC staff are unclear as to how this changes the current operating restrictions. DRBC recommends deletion.

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4. **Area Served.** Exelon Generation is the sole owner of LGS and the power developed at the plant will be transmitted and distributed throughout the service area via the Regional Transmission Organization, PJM Interconnection, LLC.

For the purpose of defining the Area Served, the Application is incorporated herein by reference consistent with conditions contained in the DECISION Section of this docket.

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Prior facilities and processes for the Exelon Generation LGS have been described in previous DRBC Dockets and/or Resolutions as indicated below:

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<u>DRBC Docket No.</u>	<u>Approval Date</u>
Resolution No. 2011-12	December 8, 2011
Resolution No. 2011-04	May 11, 2011
Resolution No. 2010-10	December 8, 2010
Resolution No. 2009-11	December 9, 2009
Resolution No. 2008-13	December 10, 2008
D-69-210 CP (Final) (Revision 12)	October 27, 2004
D-69-210 CP (Final) (Revision 11)	June 26, 2003
D-69-210 CP (Final) (Revision 10)	April 25, 1990
D-69-210 CP (Final) (Revision 9)	February 22, 1989
D-69-210 CP (Final) (Revision No. 8)	February 22, 1989
D-69-210 CP (Final) (Revision 6)	April 29, 1986
D-69-210 CP (Final) (Revision No. 5)	April 29, 1986
D-69-210 CP (Final) (Revision No. 4)	October 30, 1985
D-69-210 CP (Final) (Revision No. 2)	August 9, 1985
D-69-210 CP (Final) (Revised)	May 29, 1985
Resolution No. 76-18	1976

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Resolution No. 76-13	1976
D-69-210 CP (Final)	November 5, 1975
D-69-210 CP	March 29, 1973

a. **Water withdrawals.** There is no LGS water supply system drawing surface water for potable use at LGS. The potable water supply to the facility is provided by one of four groundwater wells in use at the LGS. The four groundwater wells are located in the Southeastern Pennsylvania Groundwater Protected Area.

Well 1 (the “Alley Well”) supplies water to a head tank for potable use at LGS. Well 3 (the “Batch Plant Well”) provides a backup source of LGS fire emergency and other emergency water. The Well 3 pump operates to replenish a fire emergency water storage tank during a fire emergency or other emergency, in the event the backup supply is needed, or during standby when the tank level is low.

Exelon Generation also uses the “Limerick Training Center” (LTC) well and the “Limerick Energy Information Center” (LEIC) well. The LTC well is used to supply water for sanitary purposes (restrooms) and is typically in operation only before and during the annual LGS refueling outage. The LEIC well is used to supply water for sanitary purposes (restrooms) and is also used infrequently.

WELL NO.	DEPTH	CASED DEPTH/ CASING DIAMETER	PUMP CAPACITY	YEAR DRILLED
Well 1 - Alley	310'	Unknown / 8"	72 gpm	Unknown
Well 3 – Batch Plant	585'	Unknown' / 8"	65 gpm	1987
Limerick Training Center (LTC)	560'	Unknown' / 6"	52 gpm	Unknown
Limerick Energy Information Center (LEIC)	198'	30' / 6"	30 gpm	1971

Wells Nos. 1 and 3 and the LTC and LEIC wells are located in the Schuylkill - Spragels Run subbasin, where total net annual groundwater withdrawal [151.77 million gallons per year (mgy)] is less than the withdrawal limit set in Section 6.1 of the *GWPAR* (1,455 mgy). The total annual groundwater allocation from these four wells is 73.2 mgy (6.1 mgm), a fraction of which will be returned to groundwater. However, even if no water from these four project wells were returned to groundwater, the total net annual groundwater withdrawal from this subbasin would

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remain below the withdrawal limits set in Section 6.1 of the *GWP*AR. Therefore, the proposed withdrawals from the wells, in conjunction with other withdrawals in this subbasin, are in accordance with the requirements of Section 6.1 of the *GWP*AR.

b. NPDES Permit(s) / DRBC Docket.

1. Limerick Generating Station: The NPDES Permit No. PA0051926, currently under review by PADEP, includes final effluent limitations for the project discharge of up to 14.2 mgd to surface waters classified by PADEP as a warm water/migratory fishery (WWF/MF). The PADEP has issued a draft renewal permit for this facility dated November 29, 2011. The following effluent limits are among those listed in the draft NPDES permit and meet or are more stringent than the effluent requirements of the DRBC.

EFFLUENT TABLE A*: DRBC Parameters Included in NPDES Permit

OUTFALL 001 (Non-Contact cooling water and industrial waste)		
PARAMETER	LIMIT	MONITORING
pH (Standard Units)	6 (Min) to 9 (Max) at all times	As required by NPDES permit
Total Suspended Solids	Monitor & Report as required by NPDES permit	As required by NPDES permit
Temperature	110°F (Max)	As required by NPDES permit
Total Dissolved Solids ***	Monitor & Report	As required by NPDES permit **

* See Condition II.q. for submittal of monitoring results to DRBC

** See Condition II.r. for additional DRBC monitoring requirements

*** See Condition II.s. for requesting substitution of specific conductance for TDS

— **2. Bradshaw Reservoir/Pipeline:** NPDES Permit No. PA0052221, made effective by PADEP on July 1, 2009, includes final effluent limitations for the project discharge of 46.2 mgd (42 mgd plus ten percent allowance for losses) to the EBPC, classified by PADEP as a Trout Stocked Fishery (TSF). The Bradshaw Reservoir, pumping station, and transmission main were approved by the DRBC via Docket No. D-79-52 CP on February 18, 1981.

— **3. WMP Discharge:** NPDES Permit No. PA00593508, made effective by PADEP on April 4, 2008, includes final effluent limitations for the project discharge to surface waters (East Branch Norwegian Creek) classified by the PADEP as a Cold Water Fishery (CWF). NPDES Permit No. PA0123293, made effective by PADEP on December 21, 2007, includes final effluent limitations for the project discharge to surface waters (East Branch Norwegian Creek) classified by PADEP as a Cold Water Fishery (CWF).

c. **Other.** Exelon Generation has submitted an O&M Plan for the Limerick Generating Station Water Supply Program which includes withdrawals from the Schuylkill River, *makeup water* withdrawals from the Perkiomen Creek and the Delaware River via the Perkiomen Creek, and *augmentation* of the Schuylkill River from the WMP and the TAWA's

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Still Creek Reservoir and Owl Creek Reservoirs (O&M Plan - Attachment No. 2). The O&M Plan has been subject to DRBC and PADEP review and has been available for public review. The O&M Plan is approved by this docket and provides for the collection of data and analysis to determine the project's compliance with the terms of this docket. As provided in the DECISION Section of this docket, changes to the O&M Plan may be approved by the DRBC Executive Director.

d. **Cost.** There are no construction costs associated with this project.

e. **Relationship to the Comprehensive Plan.** The Exelon Generation LGS facility was included in the Comprehensive Plan on March 29, 1973 by Docket No. D-69-210 CP, and has been the subject of subsequent revisions as listed above and discussed below.

The LGS facility was again modified in the Comprehensive Plan on November 5, 1975 by Docket No. D-69-210 CP (Final). The project description, conditional Findings and DECISION portions of the docket all were included. Docket No. D-65-76 CP (8) for the Point Pleasant Pumping Station (Delaware River Diversion), and Docket No. D-79-52 CP for the Bradshaw Reservoir are related to this docket approval (DA-No. 13), as they contain requirements integral to the supply of Delaware River water for use as consumptive cooling water at the LGS facility. The project is located within the drainage area of the Pennsylvania Scenic River Area recreational designation that was included in the Comprehensive Plan by Docket No. D-78-50 CP on July 26, 1978.

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B. BACKGROUND

This Background section is provided to assist interested parties in understanding the various Commission actions regarding Exelon Generation's nuclear powered LGS facility located primarily in Limerick Township, Montgomery County, PA.

Since 2003, under the terms and conditions in DRBC Dockets D-69-210 CP-11/12, Exelon Generation has conducted the Water Supply Modification Demonstration Project and the WMP Withdrawal and Streamflow Augmentation Demonstration Project (Demonstration Project) in conjunction with its water withdrawal at the LGS facility located approximately 75 miles down river near Pottstown, PA. In accordance with the authority granted the Executive Director, the Demonstration Project has also received several Executive Directive approvals, the latest of which, dated April 3, 2008, approved an extension of two LGS demonstration projects through December 31, 2008. Docket D-69-210 CP-12 was scheduled to expire on December 31, 2009 at which time if not extended or replaced, operations would revert to the condition included in Docket D-69-210 CP (Final) as amended by Resolutions Nos. 76-13 and 76-16. On December 9, 2009, the Commission approved Resolution No. 2009-11 which extended the operations of the demonstration projects under Docket D-69-210 CP-12 until December 31, 2010 or until the Commission approves a revised docket, whichever occurs first. On December 8, 2010, the

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Commission approved Resolution No. 2010-10 which extended the operations of the demonstration projects under Docket D-69-210 CP-12 until December 31, 2011 or until the Commission approves a revised docket, whichever occurs first.

On May 11, 2011, the Commission approved Resolution 2011-4 for an increase in the peak daily water withdrawal from 56.2 mgd to 58.2 mgd. In addition the Resolution also included a revised method to specify allocation quantities on a monthly basis using a 31-day month, as opposed to a rolling 30-day average. Thus the water withdrawal limits are a peak daily withdrawal of 58.2 mgd, not to exceed 1.7422 bgm. On December 8, 2011, the Commission approved Resolution No. 2011-12 which extended the operations of the demonstration project under Docket D-69-210 CP-12 for a period of one year (until December 31, 2012) or until the Commission approves a revised docket, whichever occurs first. During the Demonstration Project, water pumped from the WMP in New Castle and Norwegian Townships, Pennsylvania (PA) and water released from Still Creek Reservoir in Rush Township, PA is used to augment flows in the Schuylkill River for use as consumptive cooling water at LGS in place of makeup water that was being supplied from the Delaware River when water withdrawals from the natural river flow from the Schuylkill River were restricted.

During the operation of the Demonstration Project, Exelon Generation submitted weekly reports to the Commission. The Commission posted the weekly reports on its website at <http://www.state.nj.us/drbc/wadesville.htm>. Exelon Generation has also submitted annual reports summarizing the findings for each year of the demonstration projects, which were also posted on the Commission web site. In addition, the Commission, the Pennsylvania Fish and Boat Commission (PFBC) and PADEP held two meetings each year (generally one in January and the other in July) that were open to the public, at which the Exelon Generation operations and reports were discussed. The most recent meeting was held on February 21, 2012 at the Commission's offices.

On September 17, 2007, Exelon Generation filed an application for the renewal with modifications of the Commission's past approvals of water resource operations at LGS. The Commission's past approvals relating to the LGS consist of a series of dockets and resolutions dating from March 23, 1973 (D-69-210 CP) through Resolution No. 2011-04 dated May 11, 2011. In its application, Exelon Generation has requested docket modifications to provide long-term approval of operations and surface water withdrawals based on its experience gained during the demonstration project. Exelon Generation has also requested consolidation of the Commission's various LGS-related approvals into a single comprehensive docket. The comprehensive docket would address the surface water withdrawals requested to meet consumptive and non-consumptive needs at LGS, and the surface water discharge to the Schuylkill River of up to 14.2 million gallons per day (mgd) from the LGS facility.

Exelon Generation originally requested approval of a surface water withdrawal of up to 56.2 mgd (42 mgd consumptive plus 14.2 non-consumptive) or 1.686 billion gallons per 30 days

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(bg/30 days) to supply the consumptive and non-consumptive needs of the LGS from the Schuylkill River. Exelon Generation further requested that the docket provide the Executive Director with authority to approve alternate augmentation sources and has requested modifications to its existing dockets to incorporate into the single comprehensive renewal docket modified provisions of the demonstration projects. Exelon Generation also requested that the Schuylkill River low flow restriction be reduced from 560 cfs with two units operating and 530 cfs with one unit operating, to 379 cfs with either one or two units operating; that the Delaware River remain an approved source of consumptive cooling water for LGS; that ~~the~~ TAWA's e Still Creek Reservoir and WMP remain approved Schuylkill River augmentation sources; that the limit for TAWA's Still Creek releases to augment Schuylkill River flows for purposes of LGS operations be increased from 36 mgd to 43.3 mgd; that TAWA's Owl Creek Reservoirs be used in combination with TAWA's Still Creek Reservoir be used as an augmentation water and use at LGS; that the temperature restriction of 59° F applicable to Schuylkill River withdrawals be eliminated; that the 4-day/2-day travel time requirements for Schuylkill River augmentation sources be eliminated; that river and stream monitoring requirements be modified; and that the Restoration and Monitoring Fund be continued.

By letter dated March 30, 2011, Exelon Generation amended their application requesting a daily maximum withdrawal of up to 58.2 mgd (44 mgd consumptive use plus 14.2 non-consumptive use) without changing the amount of water to be withdrawn over a 30 day period (1.686 bg/30 days).

EARLY HISTORY

On November 5, 1975, the Commission added the LGS to the Comprehensive Plan and approved the project under Section 3.8 of the *Compact* by Docket No. D-69-210 CP (Final). The docket also incorporated into the Comprehensive Plan the Project Description, Findings and DECISION sections of Docket No. D-69-210 CP dated March 29, 1973. The "Findings" section included a subsection entitled "Source of Water Supply 1. Schuylkill River", which read as follows:

"Schuylkill River water at the plant site may be used for nonconsumptive use whenever the effluent discharged back to the river meets all applicable water quality standards.

Schuylkill River water at the plant may be used for consumptive use when flow (not including future augmentations of flow from Commission-sponsored projects) as measured at the Pottstown gage is in excess of 530 cfs (342 mgd) with one unit in operation and 560 cfs (362 mgd) with two units in operation with the following exceptions:

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- (a) There shall be no withdrawals when river water temperatures below the Limerick station are above 15°C except during April, May and June when the flow as measured at the Pottstown gage is in excess of 1791 cfs (1158 mgd).
- (b) Use of the Schuylkill River will be limited to a withdrawal that will result in an effluent that meets all applicable water quality standards.

The constraints on non-consumptive use of Schuylkill River water were considered necessary to prevent violation of total dissolved solids, stream quality objectives and effluent quality requirements of the Commission's water quality regulations. The constraint on consumptive use of Schuylkill River water is to protect water quantity and water quality below the Limerick Station. Both sets of constraints would be suspended in the event of any operational emergency requiring a shutdown of the plant."

In March of 1985, Philadelphia Electric Company (PECO) (currently known as "Exelon Generation") applied for a modification of Docket No. D-69-210 CP (Final) seeking temporary relief from the temperature limitation and the condition that water for evaporative use could not be withdrawn from the Schuylkill River when the flow at Pottstown gage (not augmented by releases from Commission sponsored reservoir storage projects) fell below the minimum flow of 530 cfs for one LGS unit in operation. A public hearing was held, and 61 comments were received and entered into the hearing record, many of which concerned the relief requested from the temperature restriction. [See Docket No. D-69-210 CP (FINAL) (REVISED), May 29, 1985]. After careful consideration of the comments, the Commission approved the temporary relief from the temperature restriction, but did not approve the relief from the 530 cfs flow requirement.

In reaching its decision to grant the temporary waiver from the temperature restriction, the Commission recognized the need to protect the Dissolved Oxygen (DO) standard. It further recognized the comments of the Pennsylvania Fish Commission (PFC) (currently PFBC) that the special seasonal needs of aquatic life required more restrictive standards. It also recognized that "[b]ecause DO varies over the day, and a number of hours are required to shut down power plant operations if the DO criteria are triggered, it is necessary to establish a buffer or 'margin of safety' somewhat above Pennsylvania or Federal water quality standards in order to assure that DO levels will not be violated during actual operations." (Docket No. D-69-210 CP (FINAL) (REVISED) May 29, 1985, p. 8.)

In summarizing its rationale for approving the temporary relief, the Commission found:

"The objective of the 59° temperature limitation contained in the original docket decision, was to prevent the Limerick project from aggravating dissolved oxygen

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conditions in the Schuylkill River during critical periods. The temporary substitution of direct dissolved oxygen monitoring at each critical downstream location is consistent with that objective. In addition, the dissolved oxygen monitors will provide data, not otherwise available to the water resource agencies, for better management of the Schuylkill River.”

(Docket No. D-69-210 CP (FINAL) (REVISED), May 29, 1985, p. 11.)

The “Decisions” section of the May 29, 1985 docket contained the following DO criteria that were substituted for the temperature restrictions:

- “(a) No withdrawals for consumptive use shall be made from the Schuylkill River or the natural flow of any of its tributaries whenever dissolved oxygen in the Schuylkill River at or below Limerick as measured at any one or more of the monitoring locations: (i) is less than 7.0 mg/l instantaneous during the period March 1 to June 15, or (ii) is equal to or less than 5.1 mg/l daily average or equal to or less than 4.2 mg/l instantaneous value during the remainder of the year.”

(Docket No. D-69-210 CP (FINAL) (REVISED), May 29, 1985, p. 12.)

The Docket also contained monitoring and reporting requirements for the period ending December 31, 1985.

On December 16, 1985, PECO submitted an application (amended January 22, 1986) for a temporary modification of Docket No. D-69-210 CP (Final) (REVISED) to allow: (1) the temporary continued substitution of the condition approved in May 1985, allowing DO monitoring in place of the temperature restriction in the original docket; and (2) the option to transfer the existing consumptive use of the Schuylkill Basin waters from the Titus and Cromby generating stations on the Schuylkill to the Limerick Unit 1 generating unit. Included with its request to use DO criteria in lieu of the temperature restriction, PECO also requested that

“...the proposed DO limits be made at five out of six monitoring points noting that individual monitoring sites may be impacted by localized positions resulting from point source discharges.”

and

“...the proposed DO limits of 5.1 mg/l average and 4.2 mg/l instantaneous apply throughout the year and stated that a more restrictive limit during the fish spawning season is overly conservative.” (Docket No. D-69-210 CP (Final) (Revision No. 5), p. 4.)

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After careful consideration of the application and comments, on April 29, 1986, the Commission issued Docket No. D-69-210 CP (FINAL) (REVISION 5), approving the request for continued modifications through the period ending December 31, 1986, subject to the terms and conditions set forth in the docket. In its approval, the Commission incorporated the recommendations of the PFC with regard to the DO criteria and monitoring locations, and relied upon the monitoring data collected from August 9 through November 30, 1985. The Commission also reiterated its concern for the protection of DO levels below LGS:

“However, one of the purposes of the original 59°F temperature limitation was to prohibit any further degradation of DO during low DO conditions, by allowing depletion of streamflow via consumptive use at Limerick. Regardless of the cause of low DO at any one of the monitoring sites, depletion of streamflow by consumptive use at Limerick could aggravate the DO problem.”

(Docket No. D-69-210 CP (FINAL) (REVISION 5), April 29, 1986, p. 4.)

In lieu of the temperature-related restrictions, the “DECISION” Section of the April 29, 1986 docket contained the following DO criteria:

“(1) For the period ending December 31, 1986, the provisions of Docket No. D-69-210 CP, [attached and included as part thereof to D-69-210 CP (Final)] headed “FINDINGS”, “Sources of Water Supply”, “1. Schuylkill River” paragraph “(a)” on page 5 are temporarily suspended, and in place thereof the following provision is substituted:

(a) No withdrawals for consumptive use shall be made from the Schuylkill River or the natural flow of any of its tributaries whenever dissolved oxygen (i) is less than 7.0 mg/l daily average or 6.0 mg/l instantaneous during the period March 1 to June 15 at any one of the monitoring sites in riffle spawning areas located below Limerick approved by the Executive Director in consultation with the Pennsylvania Fish Commission (PFC) or (ii) is equal to or less than 5.1 mg/l daily average or equal to or less than 4.2 mg/l instantaneous value at any of the six existing monitoring stations temporarily approved by DRBC Docket No. D-69-210 CP (Final) (Revised).”

(Docket No. D-69-210 CP (FINAL) (REVISION 5), April 29, 1986, pp. 10 and 11.)

The Commission issued Docket No. D-69-210 CP (FINAL) (REVISION 6) on April 29, 1986, which approved the use of waters from Still Creek and Owl Creek Reservoirs as

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augmentation to be used as consumptive cooling water at LGS through December 31, 1986. (PECO applied for Revision 6 on March 4, 1986.)

On December 8, 1986, PECO submitted an application to extend the amendments contained in docket Revisions 5 and 6. On March 25, 1987, the Commission approved Resolution No. 87-2, granting PECO's request until December 31, 1987. The Commission noted that court proceedings were delaying the construction of the facilities needed to transfer Delaware River water to LGS and preventing them from being available during 1987. The Commission also noted that the operation under docket Revisions 5 and 6 did not result in any violation of DRBC standards or policies. An additional extension of Revisions 5 and 6 was approved on February 24, 1988 (Resolution No. 88-5 (Revision 7)) through December 31, 1988. On February 22, 1989, the Commission approved Revision 8, granting an extension through December 31, 1989 of the conditions originally established in Revision 5 substituting DO limitations for the earlier temperature restrictions.

On February 8, 1990, PECO submitted an application to extend the DO criteria through August 1, 1990, when the Delaware River diversion facilities were expected to be operational. On April 25, 1990, the Commission approved Revision 10, extending the DO criteria through August 1, 1990. The temperature restrictions were required to be followed after August 1, 1990. In addition, the Commission adjusted the DO monitoring sites.

Since August 1, 1990, the temperature restrictions have been in place and Exelon Generation has complied with them.

In its May 21, 2004 (amended July 31, 2004), Exelon Generation stated that it appeared that there was no longer any water quality or scientific justification for the continuation 59°F temperature restrictions. Exelon Generation provided additional data and background information to support a demonstration project that relaxes the restriction on consumptive withdrawals for LGS during periods when the 24-hour ambient river temperature in the Schuylkill River exceeds 59°F. Exelon Generation's goal was to demonstrate that there was no reasonable potential for its LGS consumptive use withdrawals to cause violations of state or Commission water quality standards for DO, and therefore that no state or Commission limit or condition should be imposed. Furthermore, Exelon Generation indicated that the restoration/monitoring fund benefits will outweigh any potential negative effects of temporary changes in DO even if they were to occur. Exelon Generation acknowledged that there was a past need for the Commission temperature limit to ensure compliance with the DO standard established by the Commission and the State of Pennsylvania to protect the Schuylkill River, even though Exelon Generation found no technical background information for the basis of the 59°F found in the Commission record.

While Exelon Generation provided a rationale for the requested relaxation of the temperature restriction during the demonstration project period, it did not present sufficient

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information to justify that having an unrestricted use of the Schuylkill River waters for LGS consumptive cooling water needs, would continue to ensure compliance with the DO standard established by the Commission and the State of Pennsylvania to protect the Schuylkill River. The Commission has consistently expressed its concerns over the need to protect the DO standard and the aquatic biology downstream of the LGS. The Commission has used the temperature restriction as a reliably measurable criterion to accomplish this goal, and when the Commission has suspended the temperature restriction, it has substituted DO criterion. During those suspensions in 1985-90, the Commission expressed concern over the DO monitoring techniques and the ability of the LGS to react quickly if ambient DO concentrations were to drop to levels of concern. The Commission granted relief from the temperature restriction in consideration of the operating status of the LGS (i.e. only one generator was operating), the potential to temporarily augment flows (i.e. Titus and Cromby facility cutbacks, etc.) and the status of the Delaware diversion project, which would provide a more reliable alternative source of cooling water to the LGS during periods when restrictions were in place on the use of the Schuylkill River. Exelon Generation has offered no justification for its proposal to suspend the temperature restriction without reinstating DO criteria. Moreover, Exelon Generation's application included copies of comments submitted in 1982-83 by the U.S. Fisheries Service (USFS), Del-AWARE Unlimited Inc. et al. and the Pennsylvania Department of Environmental Resources (PADER), predecessor of PADEP, which also raised issues regarding appropriateness of the 59°F temperature restriction. The Commission responded to these concerns at that time and continued to support the operating and temperature restrictions to protect the Schuylkill River DO and aquatic biology.

As indicated above, Commission staff has reviewed the information and data provided by Exelon Generation in accordance with the terms of Docket D-69-210 CP-12, its current Application, and information of its own and state sources. It has also conferred with PADEP and PFBC in reaching the conclusions and decisions contained in this docket. The recommendations of the Commission staff are included in the Findings section of this docket.

C. FINDINGS

Exelon Generation (the docket holder) is applying to renew with modifications of and consolidate the Commission's past approvals of water resource operations associated with the docket holder's nuclear powered LGS.

The docket holder requested docket modifications to provide long-term approval of operations and surface water withdrawals based on its experience gained during the two demonstration projects. The docket holder also requested consolidation of the Commission's various LGS-related approvals into a single comprehensive docket. The comprehensive docket

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would address the surface water withdrawals requested to meet consumptive and non-consumptive needs at LGS, and the surface water discharge to the Schuylkill River of up to 14.2 million gallons per day (mgd) of blowdown from the LGS facility.

Surface Water Allocation: The docket holder initially requested approval of a surface water withdrawal from the Schuylkill River of up to 1.686 billion gallons per 30 days. As described in the Background section, by letter dated March 30, 2011, the docket holder amended their application requesting a daily maximum withdrawal of up to 58.2 mgd (44 mgd consumptive use plus 14.2 non-consumptive use). The docket holder also indicated it did not need an increase in the monthly withdrawal amount based on a daily withdrawal of up to 56.2 mgd (42 mgd consumptive plus 14.2 mgd non-consumptive).

The docket holder has requested the increase in the daily maximum withdrawal because consumptive use values associated with evaporation from the LGS cooling towers are heavily dependent on plant operation and ambient conditions. Consumptive use tends to be the highest at full power operation and extreme high ambient temperatures in combination with lower relative humidity. Ambient conditions can vary throughout the day as well as daily. There can also be prolonged periods of extreme conditions that result in maximum consumptive use over one or more days. The LGS was designed to operate without requiring more than 42 mgd of consumptive use. Since construction, the thermal output for each Limerick Unit was re-rated from 3,192 MWt to 3,458 MWt (an 8.33% increase) while still operating within the 42 mgd limit. A power uprate of 1.7% was approved by the NRC on April 8th, 2011, to increase the total allowable per unit thermal output to 3,515 MWt. The docket holder has calculated that the LGS will operate closer to, but still within the 42 mgd limit after this latest increase. In addition, recent data collected during the 2010 summer revealed consumptive use numbers as high as ~41.5 mgd due to ambient conditions significantly exceeding design conditions (extended periods of low humidity, 90+ degree temperatures). To increase the operating margin and to maintain docket compliance, the docket holder requested a maximum daily water use allocation of 58.2 million gallons (44 mgd consumptive plus 14.2 non-consumptive), but with no increase in the monthly water allocation limit of 1.686 billion gallons per 30-days.

The Commission has instituted a revised method to specify allocation quantities. The method allocates a volume of water (typically in million gallons) on a monthly basis using a 31-day month (mgm), as opposed to a rolling 30-day average. The allocations included in this docket reflect this allocation method.

Commission staff recommend approval of the increase in the daily maximum withdrawal from 56.2 mgd (42 mgd consumptive plus 14.2 non-consumptive) to 58.2 mgd (44 mgd consumptive plus 14.2 mgd non-consumptive), and to limit the monthly allocation to 1.7422 bgm subject to the conditions in the DECISION section of this docket.

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Groundwater Allocation: The docket holder has historically used four groundwater wells located onsite; Well 1, Well 3, the LTC well and the LEIC well. Potable water supply to the facility is provided by Well 1. Well 3 is used for backup fire emergencies. The LTC and LEIC wells are used for sanitary purposes (restrooms) and are not in frequent operation. The four groundwater wells are located in the Southeastern Pennsylvania Groundwater Protected Area. Commission staff advised the docket holder that allocations for these wells will be included in this docket. For the design year 2019, the docket holder estimates no change in demand for all four wells.

Wells Nos. 1 and 3 and the LTC and LEIC wells are located in the Schuylkill - Sprogels Run subbasin, where total net annual groundwater withdrawal (151.77 mgy) is less than the withdrawal limit set in Section 6.1 of the *GWP*AR (1,455 mgy). The total annual groundwater allocation from these four wells is 73.2 mgy (6.1 mgm), a fraction of which will be returned to groundwater. However, even if no water from these four project wells were returned to groundwater, the total net annual groundwater withdrawal from this subbasin would remain below the withdrawal limits set in Section 6.1 of the *GWP*AR. Therefore, the proposed withdrawals from the wells, in conjunction with other withdrawals in this subbasin, are in accordance with the requirements of Section 6.1 of the *GWP*AR and Commission staff recommend approval of their continued use.

Temperature Restriction: The docket holder requested that the temperature restriction of 59°F applicable to Schuylkill River withdrawals be eliminated. The docket holder's withdrawals from the Schuylkill River for consumptive cooling water needs were restricted when river temperatures below LGS were above 59°F, except during April, May and June, when the Schuylkill River flow, as measured at the Pottstown gaging station, was in excess of 1,791 cfs (1,158 mgd). Commission staff have reviewed the data collected during the multi-year Demonstration Project, conducted under Commission approved dockets, and have determined that the 24-hour average ambient river water 59°F temperature threshold used to restrict the withdrawals for the LGS consumptive use when 24-hour average river ambient flow in the Schuylkill River was above 560 cfs and at or below 1,791 cfs, is not directly linked to the dissolved oxygen (DO) concentrations in the Schuylkill River at the various down river monitoring points. Withdrawal of Schuylkill River water at temperatures exceeding 59°F, without *augmentation*, did not result in lower ambient DO. Therefore, Commission staff recommend that the 59°F threshold be eliminated.

Minimum Flow Threshold: The docket holder requested a revision of the minimum flow threshold for requiring *augmentation flow* (from the 24-hour average flow) in the Schuylkill River. The flow threshold is measured at the Pottstown gaging station. The previous docket contained a minimum flow threshold which required Exelon Generation to provide *augmentation flow* when the Schuylkill River 24-hour average flow (as measured at the Pottstown gage) was less than or equal to 560 cfs (with two units in operation) or 530 cfs (with one unit in operation). The docket holder requested that the minimum flow threshold be lowered to a new flow

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threshold of 379 cfs, with either one or two units in operation. Although ambient Schuylkill River flows of less than the 379 cfs were occasionally experienced during the term of the demonstration project, Exelon Generation was either *augmenting* the Schuylkill River or withdrawing water from Perkiomen Creek for its consumptive use at LGS. As a result, the requested flow threshold reduction to 379 cfs was not evaluated under *exclusion of augmentation* or use of Perkiomen Creek during the demonstration project. Commission staff finds that there is insufficient information presented to conclude that there would not be a significant impact of this proposed operational change as it relates to availability of water resources to downstream users and impacts on aquatic life. Therefore, Commission staff do not recommend changing the minimum flow threshold to 379 cfs. This docket continues to require Exelon Generation to provide *flow augmentation* when the 24-hour average flow in the Schuylkill River (as measured at the Pottstown gaging station) is less than or equal to **560 cfs** (with two units in operation) or **530 cfs** (with one unit in operation).

Discharge from Outfall 001: The docket holder requested the approval to discharge up to 14.2 mgd of blowdown from the LGS to the Schuylkill River (Outfall 001). This docket approves a 14.2 mgd discharge to the Schuylkill River from Outfall 001. Commission staff recommend the approval of this discharge subject to the conditions in the DECISION Section of this docket.

TDS: Section 3.10.4.D.2. of the Commission's Water Quality Regulations (WQR) requires a basin-wide effluent limit of 1,000 mg/l for total dissolved solids (TDS), or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives, and recognizes the need for reserve capacity to serve future dischargers. The docket holder's previous NPDES permits and/or DRBC dockets never applied the Commission's basin-wide TDS effluent limit of 1,000 mg/l or an alternate concentration established by the Commission to the discharge from Outfall 001.

The Commission's basin-wide in-stream TDS criteria is: 1) the receiving stream's resultant TDS concentration be less than 133% of the background (WQR Section 3.10.3.B.1.b.), and 2) the receiving stream's resultant TDS concentration shall not exceed 500 mg/l (WQR Section 3.10.3.B.2.).

The 133% of the background TDS requirement is for the protection of aquatic life. The 500 mg/l TDS requirement is to protect the use of the receiving stream as a drinking water source. The EPA's Safe Drinking Water Act's secondary standard for TDS is 500 mg/l.

Accordingly, the docket holder shall monitor for TDS at the location included in the O&M Plan which represents Outfall 001 as required in Effluent Table A. The docket holder shall submit a report within 30 months from docket effective date which includes (at least) the 48 TDS samples.

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After the effluent TDS information is gathered, the docket holder is required to demonstrate that the discharge satisfies the Commission's TDS requirements (both end of pipe and in-stream). The demonstration shall be done at the Q7-10 design condition (consecutive 7-day flow with a 10-year recurrence interval). Section 3.10.5.D. of the WQR states that the Commission's numerical stream quality objectives are based on a minimum consecutive 7-day flow with a 10-year recurrence interval and Section 4.30.7.A.7.b. of the WQR requires that the stream flow to be used in the determination of the waste assimilative capacity of an unregulated stream be the consecutive 7-day flow with a 10-year recurrence interval.

If the docket holder's discharge cannot satisfy the Commission's TDS requirements, a TDS determination from the Commission will be required. If necessary, Commission staff will use these data to determine an appropriate monthly average and daily maximum TDS effluent limit for Outfall 001. If a monthly average and daily maximum TDS effluent limit for Outfall 001 is required, the docket will be modified upon docket renewal to include the appropriate TDS requirements (See DECISION Condition II.r.).

Temperature: Section 4.30.6.B. of the Commission's WQRs requires that the discharge of wastewater to non-trout/non-tidal waters not increase the ambient temperature of the receiving waters by more than 5°F, nor shall such discharge result in stream temperatures exceeding 87°F. The Commission may grant heat dissipation areas for specific thermal discharges in accordance with the conditions contained in Section 4.30.6.F.5. of the Commission's WQRs.

On November 5, 1975, the Commission assigned the docket holder a heat dissipation area consisting of one-half the stream width (150 feet) and 3,500 feet downstream from Outfall 001 in Condition II. h. of Docket No. D-1969-210 CP (Final).

In the Environmental Report - Operating License Stage (ER-OL) for LGS, dated December 1981, the U.S. Nuclear Regulatory Commission (NRC) updated the review of the thermal discharge from LGS for compliance with EPA's recommended thermal effluent limitations for stream electric power generating point sources. The review included evaluations of the thermal discharge at cooling tower blowdown temperatures with 50, 5 and 1% probabilities of exceedance. The only set of conditions for which the temperature rise limitation of 5°F was exceeded was for the 1% exceedance blowdown temperature for October at the Q7-10 design condition (consecutive 7-day flow with a 10-year recurrence interval). The predicted temperature rise under this condition was 5.3°F.

The NRC's Final Environmental Statement (FES) for LGS, dated April 1984 re-analyzed the thermal discharge from LGS due to several modifications made to the design of the blowdown discharge system. The docket holder provided the NRC the updated thermal analysis, which considered the final design of the cooling tower blowdown diffuser, location of discharge, revised blowdown estimates and updated Schuylkill River temperature and flow data. The 1984 analysis considered annual average, monthly average and extreme combinations of Schuylkill River flow rate, LGS blowdown flow rate, and river/blowdown temperature differences. The

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analysis predicted ambient river temperature 50 feet downstream of the diffuser after mixing with one-third of the river flow. The analysis point is near the “top” of the Commission’s 1975 heat dissipation area for the LGS discharge. The extreme condition again considered the 1% exceedance blowdown temperature for October at the Q7-10 design condition (consecutive 7-day flow with a 10-year recurrence interval). The 1984 analysis predicted temperature rises well below the Commission’s 5°F limitation for almost all scenarios, except for the extreme condition. The predicted temperature rise under this condition was again approximately 5.3°F.

The Commission’s heat dissipation area granted in 1975 does not comply with the current allowable dimensions available for heat dissipation areas. It is estimated that the maximum width allowable for this location is approximately 150 feet, and that the maximum allowable length is 1,000 feet (vs. the 3,500 feet). This is considerably smaller than the 1975 heat dissipation area.

During the Demonstration project (2003-2011), the docket holder conducted hourly temperature monitoring at the LGS intake as well as at the Pennsylvania American Water Company’s (PAWC) Royersford Plant’s intake. The PAWC intake is located approximately 2 miles downstream of the LGS thermal discharge from Outfall 001. The docket holder shall summarize the percent of time during the Demonstration project that the ambient data from the LGS intake and the PAWC intake suggests that the Commission’s ambient temperature criterion of 87°F is exceeded.

In addition, the docket holder shall perform an updated thermal CORMIX analysis of their discharge. The CORMIX analysis shall consider annual average, monthly average and extreme combinations of Schuylkill River flow rate, historical and proposed LGS blowdown flow rates, and updated river/blowdown temperature differences. The CORMIX analysis shall focus on evaluating low-flow/worst case operating and climatic conditions. The CORMIX analysis will evaluate the thermal discharge from Outfall 001 during periods when the ambient conditions of the Schuylkill River are below, at and above 87°F. The CORMIX analysis will be utilized by the Commission to determine a revised heat dissipation area for Outfall 001 that is in accordance with the dimensions required in Section 4.30.6.F.5. of the Commission’s WQRs. Until such time as the Commission makes a determination regarding a revised heat dissipation area for Outfall 001, the existing heat dissipation area will remain in effect (See DECISION Condition II.t.).

Perkiomen Creek Augmentation Source – Delaware River via the Water Diversion

System: The docket holder requested that water diverted from the Delaware River to the EBPC via Bradshaw Reservoir (up to 42 mgd) remain an approved source of Perkiomen Creek *augmentation water* for consumptive use at LGS. Commission staff recommends the approval of the use of the Delaware River via the water diversion system as an approved source of Perkiomen Creek *augmentation water* for consumptive use at LGS subject to the conditions in the DECISION Section of this docket.

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Schuylkill River Augmentation Source - WMP: The docket holder requested that up to 432 mg/30 days (10,000 gpm, 14.4 mgd, 22.4 cfs) from the WMP remain an approved source of Schuylkill River *augmentation water*. Commission staff recommends the approval of the use of the WMP as an *augmentation water* source of up to 446.4 mgm (10,000 gpm, 14.4 mgd, 22.4 cfs) contingent upon the diversion being operated in accordance with the discharge limitations required by PADEP in NPDES Permits Nos. PA00593508 and PA0123293, and the in-stream TDS restriction to be developed at Landingville, PA (See DECISION Conditions II.mm. & Condition II.nn.).

Schuylkill River Augmentation Source – TAWA’s Still Creek Reservoir and Owl Creek Reservoirs: The docket holder requested that TAWA’s Still Creek Reservoir remain an approved source of Schuylkill River *augmentation water* of up to 1,080 mg/30 days (36 mgd, 55.7 cfs). ~~T~~Additionally, the docket holder also requested that the limit for Still Creek Reservoir *augmentation water* releases be increased from 36 mgd to 43.3 mgd (1,299 mg/30 days). With the Commission’s revised method to specify allocation quantities using a 31-day month, as opposed to a rolling 30-day average, the potential monthly withdrawal equivalent limit would increase to 1.342 bgm. Commission staff recommends the approval of the use of Still Creek Reservoir as an *augmentation water* source of up to 1.116 bgm (36 mgd, 55.7 cfs). TAWA is required to operate the reservoir and associated systems in accordance with the limitations included in Entitlement No. 311 (Still Creek), the Commonwealth of Pennsylvania Department of Forests and Waters, Water and Power Resources Board’s Water Allocation No. WA-626 and the future DRBC docket for the Tamaqua system. Commission staff recommend approval of the request to increase the *augmentation water* release limit from 36 mgd to 43.3 mgd (1.342 bgm) contingent upon the separate Commission review and approval of the application by TAWA for the reservoir and water supply system and a consequent finding of “no significant impact to the water resources of the basin” due to the proposed increase. The Executive Director may approve the increase from 36 mgd to 43.3 mgd (1.342 bgm) upon Commission approval of the TAWA application (See DECISION Condition II.jj).

The docket holder has also requested the approval to use releases TAWA’s Owl Creek Reservoirs in combination with releases from TAWA’s Still Creek Reservoir for up to 36 mgd (and eventually 43.3 mgd) for augmentation purposes. The two Owl Creek Reservoirs are assumed to function as a single reservoir of combined capacity. The use of releases from Owl Creek Reservoirs in conjunction with Still Creek releases were approved by the Commission until Docket Revision 12, when it was reported that the Owl Reservoirs were removed from operation due to operational complications. The Owl Creek Reservoirs are currently undergoing rehabilitation and are expected to be back in service within the next year. Commission staff recommends the approval of the use of water released from TAWA’s Owl Reservoirs in combination with TAWA’s Still Creek Reservoir be contingent upon: TAWA amending its current application or applying separately for the Owl Creek Reservoirs; separate Commission review and approval of the application by TAWA for the reservoir and water supply system and a consequent finding of “no significant impact to the water resources of the basin”; and the written approval by the Executive Director. (See Condition jj.)

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The docket holder requested that the docket provide the Executive Director with the authority to approve alternate *augmentation* sources and has requested that provision for this flexibility be incorporated into the single comprehensive renewal docket modified with the provisions of the demonstration projects. Commission staff do not recommend the approval of this request and recommend that any new or alternate *makeup* or *augmentation* source be subject to Commission approval after the public comment process which a Section 3.8 review provides.

Travel Time: The docket holder requested that the 4-day/2-day travel time requirements for Schuylkill River *augmentation* sources be eliminated. The 4-day/2-day travel time requirements refer to the requirement that the docket holder *augment* for four days prior to being allowed to withdraw the *augmentation* water at LGS and that the withdrawal be limited to 2 days after the cessation of *augmentation* releases. DRBC staff have re-evaluated the estimated travel time from the confluence of Norwegian Creek and the Schuylkill River to the Limerick Generating Station using *USGS Water Resources Investigation Report 01-4214: Prediction of Velocities for a Range of Streamflow Conditions in Pennsylvania*. The result was an estimated travel time of approximately 2.5 days. Commission staff do not recommend elimination of the travel time requirements for Schuylkill River *augmentation* sources. However, Commission staff do recommend a modification of the travel time in accordance with DECISION Conditions II.II. (Still Creek) and II.ss. (Wadesville) of this docket, which provides for a 3-day/2-day travel time for *augmentation* sources from the Upper Schuylkill.

Monitoring: The docket holder requested that river and stream monitoring requirements be modified. Commission staff recommend the following monitoring requirements:

Upper Schuylkill River near Norwegian Creek: The docket holder shall perform biological (macroinvertebrates, fish) and water quality sampling at Biological Stations 106 (Schuylkill River above the confluence of Norwegian Creek) and 109 (Schuylkill River below the confluence of Norwegian Creek). Water quality sampling will occur during releases from WMP at a minimum frequency of one sample per month; parameters for the water quality sampling will include TDS, alkalinity, total recoverable iron, dissolved iron, conductivity, pH, dissolved oxygen, and water temperature. Fishery surveys will be conducted, when conditions permit, once per year during summer low-flow periods as defined in the O&M Plan, using methods consistent with the prior sampling at these stations. Benthic macroinvertebrates will be sampled, when conditions permit, once every two years during summer low-flow periods as defined in the O&M Plan; methods for benthic macroinvertebrates will now follow the PADEP semi-quantitative method for wadeable streams (ICE methods; Instream Comprehensive Evaluation) in both the field and the laboratory. During both the fishery and macroinvertebrate surveys, *in situ* water chemistry (temperature, conductivity, pH, and dissolved oxygen) will be monitored and reported.

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East Norwegian Creek: Water quality sampling of East Norwegian Creek upstream of the confluence with West Norwegian Creek shall be conducted concurrently with the upper Schuylkill River sampling at Stations 106 and 109 for the same parameters (TDS, alkalinity, total recoverable iron, dissolved iron, conductivity, pH, dissolved oxygen, and water temperature) and at the same frequency (during releases from the WMP at a minimum frequency of one sample per month).

WMP Pumphouse Discharge Channel leading to East Norwegian Creek: The docket holder shall continue to report on the annual maintenance inspection for erosion of the channel leading to East Norwegian Creek prior to augmenting from WMP for the first time in each year.

Still Creek and Little Schuylkill River near Still Creek Reservoir: The docket holder shall perform biological (macroinvertebrates, fish) and water quality sampling at multiple stations in the vicinity of Still Creek. For water quality, sampling will occur on both Still Creek (at SC1, upstream of PA Route 309 Bridge) and the Little Schuylkill River (at LSR1 and LSR2, just below SR1020 Bridge and just below PA Route 54 Bridge, respectively). Water quality will be monitored during Still Creek releases for Exelon Generation at a frequency of one sample per month; parameters will include water temperature, conductivity, pH, and dissolved oxygen at all three stations. Fishery surveys will be conducted, when conditions permit, once per year during summer low-flow periods using methods consistent with the prior sampling and at the same two primary stations (both below Still Creek, with a separation at Neifert Creek). Benthic macroinvertebrates will be sampled, when conditions permit, once every two years during summer low-flow periods within 100 meter reaches coinciding with the fishery surveys; methods for benthic macroinvertebrates will follow the PADEP semi-quantitative methods for wadeable streams (ICE methods; Instream Comprehensive Evaluation) in both the field and the laboratory. During both the fishery and macroinvertebrate surveys, *in situ* water chemistry (temperature, conductivity, pH, and dissolved oxygen) will be monitored and reported.

East Branch Perkiomen Creek: The docket holder shall perform biological (macroinvertebrates, fish) and water quality sampling at multiple stations on the EBPC. Fishery surveys will be conducted, when conditions permit, once per year in mid- to late fall at two stations sampled during previous surveys (EEF 36235 above the Dublin USGS gage, and EEF 30700 below Callowhill Road). Fish survey methods will be consistent with the prior sampling surveys. Benthic macroinvertebrates will be sampled, when conditions permit, once every two years during summer low-flow periods at the two stations sampled during previous surveys (E36725 at Elephant Road, and E29910 at Callowhill Road). Methods for benthic macroinvertebrates will follow the PADEP semi-quantitative methods for wadeable streams (ICE methods; Instream Comprehensive Evaluation) in both the field and the laboratory. Water quality sampling will include *in situ* water chemistry (temperature, conductivity, pH, and dissolved oxygen) during both the fishery and macroinvertebrate surveys. The ecological monitoring requirements for the EBPC are also contained in the docket holder's Water Obstruction and Encroachment Permit No. E09-077A, Special Condition S., issued by the state on 01/07/1982.

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WMP Pumphouse Discharge Location: During the normal augmentation season of each year (July to October), the docket holder shall monitor for TDS and conductivity monthly. Monthly NPDES sampling (for TSS, total Mn, total Fe, and pH) is performed by RAC. The docket holder shall report results. In addition, daily withdrawals of WMP water released for Exelon Generation shall be monitored and reported.

Still Creek Reservoir Discharge: Daily releases of water from Still Creek Reservoir shall be monitored and Exelon Generation will be responsible to report in accordance with the O&M Plan.

Landingville USGS Gage: The docket holder will request that the USGS install a real-time monitor for conductivity at the USGS Landingville (01468500) gaging station within 180 days of the docket effective date. The Landingville gage is located on the Schuylkill River approximately 10.5 miles below the WMP source and approximately 47 miles upstream of the first public water supply intake (Pottstown Water Authority). The docket holder shall provide the annual cost-share to the Commission to operate and maintain the conductivity meter at the USGS gage within 60 days of invoice (See DECISION Condition II.w.). The docket holder shall also conduct in-stream sampling of the Schuylkill River at the Landingville USGS gage in order to establish the statistical relationship between TDS and conductivity. The docket holder shall initiate sampling of the Schuylkill River at the Landingville USGS gage when 24-hour average flow at that location is at or below 110 cfs. Up to 100 samples of TDS and conductivity shall be taken at the site in order to develop a statistical relationship between TDS and conductivity. The docket holder will ensure that conditions during sampling for TDS and conductivity span the range of lower flows, with a particular emphasis on adequate sampling at flows when TDS is expected to approach or exceed 500 mg/L. The docket holder shall submit the results of the in-stream sampling for TDS and conductivity and will work with DRBC to quantify the statistical relationship between these parameters. This analysis will include a determination of the conductivity at the Landingville USGS gage corresponding to a significant risk that TDS will exceed 500 mg/L.

Upon confirmation of the relationship between TDS and conductivity at Landingville and the ability to assess/access conductivity data real-time via the USGS website, the docket holder will be required to discontinue the use of the WMP as an augmentation source within ~~72~~4 hours of crossing the conductivity threshold established above the 24-hour average TDS exceeding 500 mg/L at the Landingville USGS gage (See DECISION Condition II.nn.). Following implementation of the conductivity threshold, the docket holder will collect monthly paired samples of TDS and conductivity at the Landingville USGS gage to validate the continued use of the conductivity threshold in place of a TDS requirement. After one full year of monitoring, the docket holder may request and the Executive Director may approve a reduction in the monthly paired samples of TDS and conductivity based on a written request from the docket holder and a demonstration that the conductivity/TDS relationship is consistent over time and flow conditions. During the term of this docket, the docket holder may also submit to the Executive Director a written request for an alternative monitoring program required in Condition u above and

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alternative to the Landingville TDS threshold location provided herein. Until such time as the provides written approval of an alternate monitoring and/or an alternate TDS threshold location, the docket holder will continue to comply with the requirements contained in this condition and the monitoring requirements in Condition u above.

General Monitoring Data Conditions: The required monitoring data will be reported to the DRBC as detailed in the O&M Plan. Macroinvertebrate data will be analyzed using the appropriate Index of Biotic Integrity (IBI) established by PADEP.

Schuylkill River at LGS Intake and a Downstream Location: From May 1 to October 31 of each year, the docket holder shall continuously monitor (once every 15 minutes) dissolved oxygen, temperature, pH, and conductivity at its intake (or suitable replacement) and also at a downstream location such as the ~~Pennsylvania American Water Company (PAWC)~~ Royersford intake (or suitable replacement). In addition, conductivity and temperature monitoring shall occur throughout the remainder of the year. The capability for such monitoring shall be provided by the docket effective date (See DECISION Condition II.v.).

Restoration and Monitoring Fund: The elimination of the temperature restriction of 59°F applicable to Schuylkill River withdrawals also results in the cessation of the requirement contained in the previous docket for the Restoration and Monitoring Fund (RMF). Exelon Generation's contribution to the RMF was calculated based on the volume of water that was not transferred from the Delaware River as ~~makeup~~ augmentation water when the Schuylkill River was temperature restricted. Exelon Generation's previous contribution formula is no longer valid (e.g. the temperature restriction is no longer applicable). Exelon Generation has agreed to continue to make contributions to the RMF with an annual payment by March 31st of the following year. The amount will be determined by multiplying the annual LGS consumptive use of water, as reported to DRBC, by a rate of \$0.015 per thousand gallons. The details and methodology of Exelon Generation's continued contributions to the RMF can be found in the O&M Plan.

Other: The Schuylkill River has an estimated seven-day low flow with a recurrence interval of ten years of 313 cfs/202.3 mgd (Q_{7-10}) at Pottstown, PA. The ratio of this low flow to the average design wastewater discharge (14.2 mgd/22.0 cfs) from the LGS facility is 14:1.

The estimated Q_{7-10} for the Schuylkill River at the LGS withdrawal location (as calculated at the Pottstown USGS gaging station (01472000)) is 313 cfs (202.3 mgd). Commission staff recommends that LGS's water withdrawal from the Schuylkill River not cause the natural streamflow of the Schuylkill River to be less than the estimated Q_{7-10} at the point where Outfall 001 discharges. Whenever the natural streamflow in the Schuylkill River immediately downstream of Outfall 001 is less than 313 cfs (202.3 mgd), the LGS withdrawal from the Schuylkill River shall be reduced until a Schuylkill River flow of 313 cfs (202.3 mgd) is achieved. This restriction does not preclude LGS from using available *augmentation* water or the Schuylkill River for non-consumptive use. If the docket holder exhausts its Schuylkill River

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augmentation water supplies, the docket holder must obtain its consumptive use supply from Perkiomen Creek in accordance with the provision in this docket.

The estimated Q_{7-10} for the Perkiomen Creek at the Perkiomen Pumphouse withdrawal location (as calculated at the Graterford gaging station (USGS Gage No. 01473000)) is 19.4 cfs (12.5 mgd). When use of the Schuylkill River is restricted, Exelon Generation may withdraw water from the Perkiomen Creek when its natural 24-hour average flow is at least 180 cfs /116 mgd (with one unit in operation) or 210 cfs/136 mgd (with two units in operation) as measured at the Graterford gaging station (USGS Gage No. 01473000). Additionally, Exelon Generation may use water from the Perkiomen Creek for LGS's water demands when the flow criteria for the Schuylkill River are met as provided for in DECISION Condition II.ee.

During the summer of 2010, the rating curve used at the Pottstown gaging station (USGS Gage No. 01472000) had errors approximating 300 cfs, due reportedly to the amount of aquatic vegetation and the resulting inaccuracy of the rating curve. Due to the importance of the Pottstown USGS gage relative to the operations of the LGS, it is imperative that accurate flow measurements are available from the gage. The docket holder shall request that the USGS develop/confirm rating curves at approximately monthly intervals at the Pottstown USGS gage from May through October (See DECISION Condition II.w.).

At the Perkiomen Pumphouse location, there are weirs/dams that may prevent or significantly interfere with eel passage upstream/downstream of the Pumphouse location. Within 180 days of the docket effective date, the docket holder shall submit a scope of work and schedule to conduct an American eel survey. The scope of work shall at a minimum detail the work to conduct a quantitative survey at one location upstream and two locations downstream (one immediately below the weirs/dams and one below Wetherill dam) of the Pumphouse location and an assessment of the impact of the weir/dam at the Pumphouse location. The scope of work will be subject to the approval by the Executive Director. Copies of the scope of work shall also be submitted to the PFBC and PADEP. Upon approval of the scope of work by the Executive Director, the docket holder shall commence with the American eel survey. Based in part upon the results of the American eel survey, the Executive Director may direct the docket holder to submit an engineering feasibility report to the Executive Director which will provide alternatives and recommendations to facilitate fish and eel passage at the Pumphouse location. Copies of the feasibility report shall also be submitted to the PFBC and PADEP. Based on the results of the engineering feasibility report, the Executive Director may direct the docket holder to complete designs and specifications for the recommended alternative for fish and eel passage at the Pumphouse location and to proceed with implementing the recommended alternative (See DECISION Condition II.aaabbb. of this docket).

In accordance with DECISION Condition III.a. of Docket D-1977-110 CP -Amendment 1 (Merrill Creek Owners Group docket), "Compensation Releases", in lieu of curtailment, shall be made for all "Designated Units" listed in Table A of the MCOG docket whenever the Commission's Drought Management Plan (present or future) causes the flow objective at the

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Trenton gage to drop below 3,000 cfs and the “Equivalent Flow” at Trenton drops below 3,000 cfs. In addition, “Compensation Releases will be required if and when the “Equivalent Flow” at Trenton drops below 3,000 cfs for five consecutive days due to reasons beyond the control of the DRBC. In accordance with DECISION Condition III.b. of the MCOG docket, “Designated Units” (LGS Units 1 and 2 are both “Designated Units”) shall be exempt from curtailment by the DRBC as long as the freshwater equivalent consumptive use resulting from the operation of the units is being replaced by “Compensation Releases” from the Merrill Creek Reservoir Project. However, such releases from the Merrill Creek Reservoir are not required for any portion released for LGS from the Still Creek Reservoir (See DECISION Condition II.hh.).

Liquid radioactive wastes are handled by systems enclosed within the protected area of the plant. These systems comprise the LGS radioactive liquid waste management system, which collects, treats, stores, and disposes of radioactive liquid wastes. The wastes are collected in sumps and drain tanks at various locations throughout each Limerick Unit and then transferred to the appropriate collection tanks in the common radwaste enclosure according to their classification (i.e., equipment drain, floor drain, chemical drain, or laundry drain waste). The liquid wastes are processed through treatment units to reduce radionuclide concentrations and are then either returned to the condensate system for re-use in the plant, packaged for offsite shipment, or monitored and discharged from the plant into the cooling tower blowdown line on a batch basis. The mixing of the effluent with the blowdown flow maintains the radionuclide concentrations at the release point in the Schuylkill River below 10 CFR Part 20 limits. Radionuclide effluents are under the jurisdiction of the NRC. Exelon Generation prepares and submits an Annual Radiological Environmental Operating Report for LGS to the NRC that assesses calculated offsite dose data resulting from radioactive liquid effluents. No adverse radiological impacts on the environment have been reported.

The nearest surface water intake of record for public water supply downstream of LGS’s cooling water discharge is Pennsylvania American Water Company’s Royersford system, approximately 2.15 miles downstream.

The limits in the NPDES Permit(s) are in compliance with Commission effluent quality requirements, where applicable.

The project does not conflict with the Comprehensive Plan and is designed to prevent substantial adverse impact on the water resources related environment, while sustaining the current and future water uses and development of the water resources of the Basin.

D. DECISION

I. On the effective date for Docket No. D-69-210 CP-13 below:

a. The projects described in Docket No(s). D-69-210 CP (Final) (Revision 12), D-69-210 CP (Final) (Revision 11)*, D-69-210 CP (Final) (Revision 10), D-69-210

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CP (Final) (Revision 9), D-69-210 CP (Final) (Revision No. 8), D-69-210 CP (Final) (Revision 6), D-69-210 CP (Final) (Revision No. 5), D-69-210 CP (Final) (Revision No. 4), D-69-210 CP (Final) (Revision No. 2), D-69-210 CP (Final) (Revised), D-69-210 CP (Final), D-69-210 CP are removed from the Comprehensive Plan to the extent that they are not included in Docket No. Docket No. D-69-210 CP-13.

b. Docket No(s). D-69-210 CP (Final) (Revision 12), D-69-210 CP (Final) (Revision 11)*, D-69-210 CP (Final) (Revision 10), D-69-210 CP (Final) (Revision 9), D-69-210 CP (Final) (Revision No. 8), D-69-210 CP (Final) (Revision 6), D-69-210 CP (Final) (Revision No. 5), D-69-210 CP (Final) (Revision No. 4), D-69-210 CP (Final) (Revision No. 2), D-69-210 CP (Final) (Revised), D-69-210 CP (Final), D-69-210 CP are terminated and replaced by Docket No. D-69-210 CP-13.

c. The project and the appurtenant facilities described in Section 1 “Physical Features” shall be added to the Comprehensive Plan.

II. The project and appurtenant facilities as described in the Section A “Physical features” of this docket are approved pursuant to Section 3.8 of the *Compact*, subject to the following conditions:

STANDARD CONDITIONS

a. Docket approval is subject to all conditions, requirements, and limitations imposed by PADEP in its NPDES permit, and such conditions, requirements, and limitations are incorporated herein, unless they are less stringent than the Commission’s.

b. The facility and operational records shall be available at all times for inspection by the DRBC.

c. The facility shall be operated at all times to comply with the requirements of the *Water Quality Regulations* of the DRBC

d. Except as otherwise authorized by this docket, if the docket holder seeks relief from any limitation based upon a DRBC water quality standard or minimum treatment requirement, the docket holder shall apply for approval from the Executive Director or for a docket revision in accordance with Section 3.8 of the *Compact* and the *Rules of Practice and Procedure*.

e. Nothing herein shall be construed to exempt the docket holder from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.

f. The docket holder is permitted to treat and discharge the categories of wastewaters defined in the “Area Served” section of this docket.

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g. The docket holder is permitted to provide the water approved in this docket to the areas included in Section A.3. Area Served of this docket. Any expansion beyond those included in Section A.3. Area Served is subject to DRBC review and approval in accordance with Section 3.8 of the *Compact*.

h. The docket holder shall pay for surface water use in accordance with the provisions of Resolution No. 74-6, as amended.

i. The docket holder shall make wastewater discharge in such a manner as to avoid injury or damage to fish or wildlife and shall avoid any injury to public or private property.

j. Nothing in this docket approval shall be construed as limiting the authority of DRBC to adopt and apply charges or other fees to this discharge or project.

k. The issuance of this docket approval shall not create any private or proprietary rights in the waters of the Basin, and the Commission reserves the right to amend, suspend or rescind the docket for cause, in order to ensure proper control, use and management of the water resources of the Basin.

l. A complete application for the renewal of this docket, or a notice of intent to cease the operations (withdrawal, discharge, etc.) approved by this docket by the expiration date, must be submitted to the DRBC at least 12 months prior to the expiration date below (unless permission has been granted by the DRBC for submission at a later date), using the appropriate DRBC application form. In the event that a timely and complete application for renewal has been submitted and the DRBC is unable, through no fault of the docket holder, to reissue the docket before the expiration date below, the terms and conditions of this docket will remain fully effective and enforceable against the docket holder pending the grant or denial of the application for docket approval.

m. The Executive Director may modify or suspend this approval or any condition thereof, or require mitigating measures pending additional review, if in the Executive Director's judgment such modification or suspension is required to protect the water resources of the Basin.

n. The docket holder and any other person aggrieved by a reviewable action or decision taken by the Executive Director or Commission pursuant to this docket may seek an administrative hearing pursuant to Articles 5 and 6 of the Commission's *Rules of Practice and Procedure*, and after exhausting all administrative remedies may seek judicial review pursuant to Article 6, section 2.6.10 of the *Rules of Practice and Procedure* and section 15.1(p) of the Commission's *Compact*.

o. If the operation of this project significantly affects or interferes with any domestic or other existing wells or surface water supplies, or if the docket holder

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receives a complaint by any user of wells or surface water supplies within the zone of influence of the withdrawal, the docket holder shall immediately notify the Executive Director of any complaints by users of wells or surface water supplies within the zone of influence of the withdrawal, and unless excused by the Executive Director, shall investigate such complaints. The docket holder should direct phone call notifications of potential well or surface water interference or complaints of interference to the DRBC Project Review Section at 609-883-9500, extension 216. Oral notification must always be followed up in writing directed to the Executive Director. In addition, the docket holder shall provide written notification to all potentially impacted users of wells or surface water supplies of the docket holder's responsibilities under this condition. Any well or surface water supply which is substantially adversely affected, or rendered dry or otherwise unusable as a result of the docket holder's project withdrawal, shall be repaired, replaced or otherwise mitigated at the expense of the docket holder. A report of investigation and/or mitigation plan prepared by a hydrologist shall be submitted to the Executive Director as soon as practicable. The Executive Director shall make the final determination regarding the validity of such complaints, the scope or sufficiency of such investigations, and the extent of appropriate mitigation measures, if required.

p. For the duration of any drought emergency declared by either Pennsylvania or the Commission, water service or use by the docket holder pursuant to this approval shall be subject to the prohibition of those nonessential uses specified by the Governor of Pennsylvania, the Pennsylvania Emergency Management Council, PADEP, or the Commonwealth Drought Coordinator to the extent that they may be applicable, and to any other emergency resolutions or orders adopted hereafter by the Commission.

MONITORING CONDITIONS - DISCHARGE

q. The docket holder shall comply with the requirements contained in the Effluent Table in Section A.4.b. of this docket. ~~The docket holder shall submit the required monitoring results directly to DRBC (Project Review Section). The monitoring results shall be submitted annually absent any observed limit violations. If a DRBC effluent limit is violated, the docket holder shall submit the results and provide a written explanation within 30 days of the violation the action(s) the docket holder has taken to correct the violation and protect against a future violation.~~ The docket holder shall submit the required monitoring results directly to the DRBC Project Review Section starting in 2014. The monitoring results shall be submitted annually, absent any observed limit violations, by January 31. If a DRBC effluent limit is violated, the docket holder shall submit the result(s) to the DRBC within 30 days of the violation(s) and provide a written explanation that states the action(s) the docket holder has taken to correct the violation(s) and protect against any future violations.

r. The docket holder shall monitor for TDS at the location included in the O&M Plan which represents Outfall 001 twice/month, as required in EFFLUENT TABLE

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A, for 24 months. Exelon Generation shall submit a report within 30 months of docket effective date which includes (at least) the 48 TDS samples. Included in the report will be an analysis that evaluates the discharge from Outfall 001 and compliance with the Commission's TDS requirements. Upon docket renewal, if necessary, Commission staff will use this data to determine an appropriate monthly average and daily maximum TDS effluent limit for Outfall 001.

s. The docket holder may request of the Executive Director in writing the substitution of specific conductance for TDS. The request should include information that supports the effluent specific correlation between TDS and specific conductance. Upon review, the Executive Director may modify the docket to allow the substitution of specific conductance for TDS monitoring.

t. The docket holder shall submit a CORMIX modeling analysis within 6 months of the effective date of this docket. The CORMIX analysis will evaluate the thermal discharge from Outfall 001 during periods when the ambient conditions of the Schuylkill River are below, at and above 87°F. The analysis shall also include a summary of the percent of time during the Demonstration project that the ambient data from the LGS intake and the PAWC Royersford intake suggests that the Commission's ambient temperature criterion of 87°F is exceeded. The CORMIX analysis will be utilized by the Commission to determine a revised heat dissipation area for Outfall 001 that is in accordance with the dimensions required in Section 4.30.6.F.5. of the Commission's WQRs. Until such time as the Commission makes a determination regarding a revised heat dissipation area for Outfall 001, the existing heat dissipation area will remain in effect.

MONITORING CONDITIONS - OTHER

u. The docket holder shall request that the USGS install a real-time monitor for conductivity at the USGS Landingville (01468500) gaging station within 180 days of effective date of this docket. The docket holder shall provide the annual cost-share to the Commission to operate and maintain the conductivity meter at the USGS gage. The docket holder shall also conduct in-stream sampling of the Schuylkill River at the Landingville USGS gage in order to establish the statistical relationship between TDS and conductivity. The docket holder shall initiate sampling of the Schuylkill River at the Landingville USGS gage when the 24-hour average flow at Landingville is at or below 110 cfs. Up to 100 samples of TDS and conductivity shall be taken in order to develop a statistical relationship between TDS and conductivity. The docket holder will ensure that conditions during sampling for TDS and conductivity span the range of lower flows, with a particular emphasis on adequate sampling at flows when TDS is expected to approach or exceed 500 mg/l. The docket holder shall submit the results of the in-stream sampling for TDS and conductivity to the Executive Director for review and approval. This analysis will include a determination of the conductivity at the Landingville USGS gage corresponding to a significant risk that TDS will exceed 500 mg/l. Following

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implementation of the conductivity threshold, the docket holder shall collect monthly paired samples of TDS and conductivity at the Landingville gage to validate the continued use of the conductivity threshold in place of a TDS requirement. After one full year of monitoring, the docket holder may request and the Executive Director may approve a reduction in the monthly paired samples of TDS and conductivity based on a written request from the docket holder and a demonstration that the conductivity/TDS relationship is consistent over time and flow conditions.

v. The docket holder shall provide continuous (every 15 minutes) but not real time measurement data for dissolved oxygen, temperature, pH, and conductivity at their Schuylkill River intake (or suitable replacement) and at a downstream location (such as the PAWC Royersford intake, or suitable replacement) for the period of May 1 to October 31 of each year by the effective date of this docket. In addition, conductivity and temperature monitoring shall occur throughout the remainder of the year. The results shall be submitted monthly to the Commission.

w. The docket holder shall continue to provide the local sponsor costs for the following USGS gages to the Commission for reimbursement to the USGS:

01472620: EBPC near Dublin, PA (Bucks Road)

01468500: Schuylkill River at Landingville, PA (conductivity probe costs only)

01472000: Schuylkill River at Pottstown, PA. The docket holder shall request and contract with the USGS so that approximately monthly rating curves at the Pottstown USGS gage are developed/confirmed from May through October.

The docket holder shall submit such payment as prepared by the USGS to the Commission within 60 days of invoice.

OPERATING CONDITIONS – WITHDRAWALS: SCHUYLKILL RIVER

x. Surface water withdrawals from the Schuylkill River shall not exceed 1.7422 ~~BGM~~ bgm and 58.2 mgd (44 mgd consumptive plus 14.2 non-consumptive) to supply the consumptive and non-consumptive needs of the LGS.

y. With one unit in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is greater than 530 cfs, the unaugmented surface water withdrawal for consumptive use is restricted to 24 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm.

z. With two units in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is greater than 560 cfs, the unaugmented surface water withdrawal for

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consumptive use is restricted to 44 mgd and 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm.

aa. With one unit in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **less than or equal to 530 cfs**, the **augmented** surface water withdrawal for consumptive use is restricted to 24 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm. All consumptive use will be augmented on a 1:1 gpd basis.

bb. With two units in operation, when the 24-hour average flow in the Schuylkill River, as measured at the Pottstown Gaging station (USGS Gage No. 01472000), is **less than or equal to 560 cfs**, the **augmented** surface water withdrawal for consumptive use is restricted to 44 mgd and to 14.2 mgd non-consumptive use, with the total not to exceed 1.7422 bgm. All consumptive use will be augmented on a 1:1 gpd basis.

cc. LGS's Schuylkill River intake withdrawal must not cause the flow in the Schuylkill River to be less than 313 cfs (202.3 mgd) at the point where Outfall 001 discharges. Whenever the natural streamflow in the Schuylkill River immediately downstream of Outfall 001 is less than 313 cfs (202.3 mgd), the Schuylkill River consumptive withdrawal for LGS shall be reduced until a Schuylkill River flow of 313 cfs (202.3 mgd) is achieved. This does not preclude LGS from using available *augmentation water* or the Schuylkill River for non-consumptive use. If the docket holder exhausts its Schuylkill River *augmentation water* supplies, the docket holder must obtain its consumptive use supply from Perkiomen Creek in accordance with the conditions in this docket.

OPERATING CONDITIONS – GROUNDWATER WITHDRAWALS: LGS

dd. During any month, the withdrawals from the following wells shall not exceed (except during fire emergencies or other plant emergencies):

WELL NO.	INSTANTANEOUS ALLOCATION (GPM)	MONTHLY ALLOCATION (MILLION GALLONS)
Well 1 – Alley	72	3.1
Well 3 – Batch Plant	65	2.8
LTC Well	52	0.1
LEIC Well	30	0.1

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OPERATING CONDITIONS – WITHDRAWALS: PERKIOMEN CREEK

ee. Exelon Generation may withdraw up to 24 mgd of water from the Perkiomen Creek for consumptive cooling water needs when the natural 24-hour average creek flow is at least 180 cfs /116 mgd (with one unit in operation) or up to 42 mgd when the natural 24-hour average creek flow is at least 210 cfs/136 mgd (with two units in operation) as measured at the USGS Graterford gaging station and the use of the Schuylkill River is limited or restricted. Exelon Generation also is approved to use Perkiomen Creek water to supply the small auxiliary pump, which operates as needed to: (1) maintain system operability by keeping the discharge pipelines and storage tank sufficiently full to prevent water hammer when the intake pumps are started; (2) maintain level in the storage tank when the system is not in use; and (3) provide freeze protection by agitating the storage tank water during frigid weather conditions. The approval to withdraw water from the Perkiomen Creek (via natural flow or intrabasin transfer) for use at LGS also applies when the natural flow criteria for the Schuylkill River are met provided that (1) an abnormal condition exists that prevents withdrawal from the Schuylkill River (e.g., the Schuylkill Pumphouse is out of service, an ice jam on the river prevents withdrawal, or an upstream spill causes severe intake water quality impairment which could result in equipment damage); (2) a plant operational/maintenance condition exists that that could be mitigated by the selective use of Perkiomen Creek water (e.g., using Perkiomen Creek water having lower total dissolved solids than the Schuylkill River, when a condenser chemistry issue is detected until such issue can be resolved), or (3) LGS has already switched over to using the Perkiomen Creek intake when use of the Schuylkill River is restricted, but the Schuylkill River then cycles between meeting and not meeting its flow criteria, which would otherwise require LGS to repeatedly start up and shut down both intake pump houses over a relatively short period of time. In order to withdraw from the Perkiomen Creek when the natural flow criteria for the Schuylkill River are met, Exelon shall notify the DRBC in accordance with the approved O&M Plan within 24 hours (or the next business day) after such use starts, which shall include an estimate of the duration of such use. Operation of the small auxiliary pump is exempt from this notification requirement. Exelon shall also provide notification to the DRBC in accordance with the approved O&M Plan when normal operations are back in effect. The DRBC Executive Director reserves the right to modify water supply operations under such conditions.

ff. Exelon Generation shall maintain a minimum flow of at least 10 cfs in the EBPC at all times in accordance with the O&M Plan (Attachment No. 2). After consultation with the PFBC and PADEP, the Executive Director may approve requests by Exelon Generation to increase flows in the EBPC above 10 cfs from the Bradshaw Reservoir to support short-term recreational events. Such approval will be granted only after the review and approval by the Executive Director of a written request by Exelon Generation. Exelon Generation shall submit its written request (along with a flow management plan) at least 60 days in advance of the proposed release date. Copies of such plans will be sent by Exelon Generation to the PFBC and PADEP.

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gg. Condition II. C. of Docket No. D-79-52 CP (approved February 18, 1981) required PECO (Exelon Generation's predecessor) to maintain 27 cfs in the EBPC while LGS was in operation and 10 cfs at all other times. Condition II. P. of Docket No. D-79-52 CP reserves the right of the Commission to open said docket at any time, and to reconsider its decision and any and all conditions imposed hereunder in light of further information developed by, or decisions rendered in, pending or future proceedings conducted by other State and Federal agencies concerning the development and operation of LGS and related facilities. Condition II.P. also allowed the Commission to, at any time, modify existing conditions, or impose additional conditions, upon the construction and operation of this facility to reflect new or changed information or to conform to requirements imposed on the project by other agencies. By approval of this docket, the Commission is modifying Condition II. C. of Docket No. D-79-52 to read as follows:

“C. Exelon Generation shall maintain a minimum of 10 cfs (6.5 mgd) in the East Branch Perkiomen Creek at the Bucks Road stream gage at all times except for times when a condition arises (e.g., loss of pumping capability at Bradshaw Reservoir) that prevents minimum flow maintenance as required. Such conditions and provisions for DRBC notification shall be outlined in the DRBC-approved O&M Plan applicable to LGS's Water Supply Program.”

hh. In accordance with Condition III. a. of Docket D-1977-110 CP - Amendment 1 (MCOG docket), “Compensation Releases”, in lieu of curtailment, shall be made for all “Designated Units” listed in Table A of the MCOG docket whenever the Commission's Drought Management Plan (present or future) causes the flow objective at the Trenton gage to drop below 3,000 cfs and the “Equivalent Flow” at Trenton drops below 3,000 cfs. In addition, “Compensation Releases” will be required if and when the “Equivalent Flow” at Trenton drops below 3,000 cfs for five consecutive days due to reasons beyond the control of the DRBC. In accordance with Condition III. b. of the MCOG docket, “Designated Units” (LGS Units 1 and 2 are both “Designated Units”) shall be exempt from curtailment by the DRBC as long as the freshwater equivalent consumptive use resulting from the operation of the units is being replaced by “Compensation Releases” from the Merrill Creek Reservoir Project. However, such releases from the Merrill Creek Reservoir are not required for any portion released for LGS from the Still Creek Reservoir.

ii. Water diverted via the Point Pleasant Pumping Station is restricted to the use, conditions and service area set forth in Docket No. D-65-76 CP (8) and cannot be used for any other purposes unless approved by the Commission.

OPERATING CONDITIONS – WITHDRAWALS: STILL CREEK RESERVOIR

jj. Exelon Generation may use up to 1,116 mgm (36 mgd) of water from TAWA's Still Creek Reservoir as an *augmentation* source. Contingent upon the separate Commission review and approval of the application by TAWA for the reservoir

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and water supply system and a consequent finding of “no significant impact to the water resources of the basin”, the Executive Director may approve in writing an increase in the amount of augmentation water from Still Creek Reservoir from 36 mgd to 43.3 mgd (1,342.3 mgm).

kk. To assure reliability and to allow for operational flexibility, Schuylkill River flows may continue to be *augmented* by releases from the TAWA’s Still Creek Reservoir, increased by the quantity of TAWA’s Still Creek (and TAWA’s Owl Creek Reservoirs if approved in writing by the Executive Director in accordance with Condition jj. above) water lost en route to LGS through evaporation (3%), for LGS consumptive cooling water needs in accordance with the approved O&M Plan. No release from the TAWA’s Still Creek Reservoir operating volume is allowed for LGS consumptive cooling water use whenever the water level in the reservoir pool is below the Operating Rule Curve shown in the O&M Plan or an updated Operating Rule Curve approved by the DRBC Executive Director.

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ll. During the term of this docket, in any period beginning three days after initiation of releases from the TAWA’s Still Creek Reservoir ~~and ending two~~ days after cessation of releases from the reservoir, Exelon Generation is authorized to withdraw Schuylkill River water at its LGS intake in a quantity equal to 97% of the water released for Schuylkill River augmentation ~~discharge~~ from TAWA’s Still Creek Reservoir (and TAWA’s Owl Creek Reservoirs if approved in writing by the Executive Director in accordance with Condition jj. above).

OPERATING CONDITIONS – WITHDRAWALS: WADESVILLE

mm. Exelon Generation may use the WMP as an *augmentation* source to provide up to 446.4 mg/month (10,000 gpm, 14.4 mgd, 22.4 cfs) of water, as appropriate to augment the Schuylkill River to meet its LGS consumptive use demands as identified above at times when the 24-hour average flow in the Schuylkill River as measured at the gaging station at Pottstown is less than or equal to 530 cfs with one unit in operation and 560 cfs with two units in operation.

nn. Upon the Executive Director’s written approval of the relationship between TDS and conductivity at Landingville (See DECISION Condition II.u. above), and the ability to assess/access conductivity data real-time via the USGS website, within ~~2724~~ hours of crossing the 24-hour average conductivity threshold established above for TDS exceeding 500 mg/l at the Landingville USGS gaging station (USGS Gage No. 01468500), the docket holder will discontinue the use of augmentation releases from the WMP as an augmentation source. During the term of this docket, the docket holder may submit to the Executive Director a written request for an alternative monitoring program required in Condition u above and alternative to the Landingville TDS threshold location provided herein. Until such time as the provides written approval of an alternate monitoring and/or an alternate TDS threshold location, the docket holder will continue to comply with

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the requirements contained in this condition and the monitoring requirements in Condition u above.

oo. During the term of this docket Exelon Generation shall perform a maintenance inspection for erosion prior to the startup of *augmentation* from the WMP for the first time in each year. The channel from the discharge point to approximately 50 feet downstream of the New Wadesville Road shall be inspected and repaired if any erosion problems have occurred that inhibit the discharge or are as a result of the discharge.

pp. Exelon Generation shall maintain detailed, accurate records of WMP water discharges when water is released on LGS's behalf. Exelon Generation shall notify DRBC of initiation and cessation of WMP water discharges each augmentation season in accordance with the approved O&M Plan (Attachment No. 2).

qq. The Executive Director may modify or suspend WMP water discharges and/or reservoir releases if evidence indicates that either is causing violations of water quality standards and/or causing unacceptable impacts to the aquatic biota of the receiving waters.

rr. There shall be no increase in the installed depth of the WMP pump casings greater than 600 feet on behalf of Exelon Generation for consumptive use *augmentation* without prior notification to DRBC and approval by the Executive Director. Exelon Generation shall not draw the mine pool down below 600 feet for consumptive use make-up without permission from the DRBC. Exelon Generation may request and the Executive Director may approve changes to the O&M Plan.

ss. During the term of this docket, in any period beginning three days after initiation of pumping from the WMP and ending two days after cessation of pumping from the WMP, Exelon Generation is authorized to withdraw Schuylkill River water at its LGS intake in an amount equal to 97% of its pumpage rate from the mine pool.

tt. The required monitoring information, -including the report on the erosion inspection required above, shall be compiled and submitted to the DRBC in an annual assessment report by January 31st of each year.

uu. During an emergency, if normal constraints on withdrawals cannot be met, the docket holder may use surface water from the sources, designated herein as necessary, to address the emergency until it has been stabilized, in accordance with the O&M Plan and/or emergency shutdown procedures established by the NRC. Notification of and consultation with the Executive Director should occur as soon as possible but no later than 24 hours after the emergency is known by the docket holder.

vv. In the event that conditions exist that require the water diversion system to be in service to supply water for LGS's consumptive use, but the system is unavailable or of diminished capacity, an equal volume of water, up to 36.0 mgd (peak daily withdrawal) and 1.116 bgm, may be released from Still Creek Reservoir, subject to its Operating Rule Curve and allowing an additional three percent for in-transit evaporative

Comment [BM3]: Exelon to provide language limiting the use during a 3 day operational transition to the Tamaqua supply. In addition Exelon will add language that provides for notification of downstream Schuylkill River surface water withdrawers.

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losses, and withdrawn for consumptive use at LGS. Notification of such releases to the Commission should occur as soon as possible but no later than 48 hours after the event occurs. Upon written approval from the Executive Director, consistent with DECISION Condition II.jj. of this docket, the amounts may be increased from up to 36.0 mgd and 1.116 bgm to up to 43.3 mgd and 1.342 bgm, respectively. Upon written approval of the Executive Director, the Owl Creek Reservoirs may be approved for augmentation releases and use at LGS in combination with Still Creek Reservoir.

~~vv. In order to minimize potential interruptions to base load generation of electricity from LGS that possibly could adversely affect the regional electricity supply grid, releases from Still Creek Reservoir also are approved for use by Exelon Generation as augmentation of the Schuylkill River to meet up to 36 mgd (peak daily withdrawal) and 1.116 bgm of LGS's consumptive cooling water needs when (1) flows in both the Schuylkill River and Perkiomen Creek are less than the minimum amounts for one Unit and two Unit operation; and (2) sufficient water diversion system capacity is unavailable. Such releases are subject to the reservoir Operating Rule Curve, must allow an additional three percent for in-transit evaporative losses, but are not subject to travel time requirements. Notification of the Commission should occur as soon as possible but no later than 48 hours after such use.~~

Comment [BM4]: See earlier comment; DRBC staff recommend deletion.

OTHER CONDITIONS

ww. Exelon Generation shall comply with O&M Plan (Attachment No. 2) approved by the Executive Director. The O&M Plan specifies monitoring parties and locations, monitoring parameters and frequencies, and reporting requirements for compliance by Exelon Generation and other designated parties during the term of this docket. Applicable data collected as part of the project conducted under Docket No. D-69-210 CP-11 and 12 will be used as baseline data. The O&M Plan ~~shall~~ includes the following operating and monitoring requirements: 1) for releases from the WMP including East Norwegian Creek, Norwegian Creek and Schuylkill River 2) for releases from TAWA's Still Creek Reservoir and Owl Creek Reservoirs including Still Creek 3) for DO downstream of LGS 4) for the diversions from the Delaware River to the EBPC 5) for the calculation and reporting of Exelon Generation's contributions to the restoration and monitoring fund 6) notification, *augmentation/makeup* accounting, and contingency procedures and 7) roles and responsibilities for all involved parties.

xx. Based on the monitoring data collected in accordance with Condition II.tt. above, Exelon Generation shall prepare and file ten hard copies and two CD-ROM electronic copies of its assessment report with DRBC prior to January 31st of each year. The first report shall be in 2013. DRBC and Exelon Generation will meet at least annually to discuss the progress of the project. Unless the Executive Director, in consultation with Exelon Generation, chooses otherwise, these meetings shall take place in connection with submittal of the annual assessment report.

yy. The Executive Director may modify the O&M Plan (Attachment No. 2) if the results indicate a change is required or appropriate. Exelon Generation may

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also request modifications to the O&M Plan. Exelon Generation has the right to request a hearing if it disagrees with a decision of the Executive Director with respect to the O&M Plan.

zz. The Executive Director may also direct the docket holder to resume makeup water operations *via* the Delaware River diversion if the conditions warrant it. Exelon Generation will comply with the Executive Director written directive within 48 hours of its receipt. Under Article 6 of the Rules of Practice and Procedure, Exelon Generation has the right to request a hearing if it disagrees with a decision of the Executive Director, but must comply with the directive during the period of the appeal process.

aaa. Exelon Generation shall record daily releases from the WMP and Still Creek Reservoir, as totaled and reported by RAC and TAWA, respectively, and Bradshaw Reservoir, as measured and recorded by Exelon Generation, and include the daily data for such releases in the annual report.

bbb. Within 180 days of docket effective date, the docket holder shall submit a scope of work and schedule to conduct an American eel survey. The scope of work shall at a minimum detail the work to conduct a quantitative survey at one location upstream and at two locations downstream (one immediately below the weirs and one below Wetherill dam) of the Pumphouse location and an assessment of the impact of the weir/dam at the Perkiomen Pumphouse location. The scope of work will be subject to the approval by the Executive Director. Copies of the scope of work shall also be submitted to the PFBC and PADEP. Upon approval of the scope of work by the Executive Director, the docket holder shall commence with the American eel survey. Based in part upon the results of the American eel survey, the Executive Director may direct the docket holder to submit an engineering feasibility report to the Executive Director which will provide alternatives and recommendations to facilitate fish and eel passage at the Perkiomen Pumphouse location. Copies of the feasibility report shall also be submitted to the PFBC and PADEP. Based on the results of the engineering feasibility report, the Executive Director may direct the docket holder to complete designs and specifications for the recommended alternative for fish and eel passage at the Perkiomen Pumphouse location and to proceed with implementing the recommended alternative.

BY THE COMMISSION

DATE APPROVED: December ~~5~~, 2012

EFFECTIVE DATE: April 1~~January 4~~, 2013

EXPIRATION DATE: April 1~~January 4~~, 2018