PSEG Power Connecticut LLC
Bridgeport Harbor Station, 1 Atlantic Street, Bridgeport, CT 06604-5513

Submitted by Email and Hardcopy

June 29, 2017

Melanie A. Bachman
Acting Executive Director
State of Connecticut
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Development and Management Plan Update No. 1
Underground Utility Design and Water Balance Revisions
PSEG Power Connecticut LLC
Bridgeport Harbor Station Unit 5 Combined Cycle Project
Petition No. 1218

Dear Ms. Bachman:

This Development and Management Plan Update No. 1 (D&MP Update No. 1) provides revised and updated underground utility plans and water balance for review and approval by Connecticut Siting Council (CSC) staff.

By way of background, this project is the combined cycle generating facility designated by PSEG Power Connecticut LLC (PSEG) as Bridgeport Harbor Station Unit 5 (BHS 5, the "Project" or the "Facility") as addressed in Petition No. 1218. An initial D&MP submittal (D&MP Phase 1), for construction support facilities was filed with the CSC on September 21, 2016. A second D&MP submittal (D&MP Phase 2) was filed on October 31, 2016. Collectively, these two D&MP documents included the complete design and construction details of the Project as known at that time. The D&MPs were approved by the CSC on October 27, 2016 and December 22, 2016, respectively.

In connection with this submittal, PSEG, in consultation with the project Design Engineering firm (SNC-Lavalin), initiated a review of the underground utility design and the plant water balance. The focus of these reviews was to determine if construction efficiencies and functional improvements in the designs could be identified. The review indicated that revisions to the design were appropriate and the result is this D&MP Update No. 1, providing a revised underground utility design and an updated plant water balance.

Most of the proposed underground utility changes are minimal in nature and involve raising the utilities, avoiding potential interferences with foundations and other utilities, and reducing utility runs where possible. The stormwater underground conveyance system design has been modified by moving it to the perimeter of the site to facilitate optimization of other subsurface features

and provide for easier operation and maintenance of the stormwater conveyance system. The site finished grading includes yard stone, which will serve to provide a drainage pathway to the perimeter.

The revised design will not result in: a change in the Project's Limit of Disturbance (LOD); an increase in the drainage area being treated by the Mechanical Treatment Device (MTD); any change to the design of the MTD; or any change in the stormwater outfall structure that were included in the original stormwater design for the new plant. This is consistent with the design submitted to the CSC in D&MP Phase 2.

To summarize, the underground utility system design has been modified for construction efficiencies and to provide for functional improvements. The stormwater conveyance system has been relocated to the perimeter of the development area to allow for optimization of the underground utilities for the new combined cycle plant and to allow for easier operation and maintenance of the stormwater conveyance system.

Review of the water balances was initiated to determine if fresh water requirements could be reduced for some operating conditions and / or whether wastewater flows could be reduced. The revised plant water balance more accurately depicts the operating scenarios anticipated for the new plant.

If you have any questions or require clarification, please contact me at 973-856-0066 or the Project Senior Technical Director / Regulatory Lead, Jeff Pantazes at 856-359-7645.

Very truly yours

David Hinchey, Jr.

Manager Environmental - Major Permits & Technical Services
PSEG Power LLC
Fossil Environmental Affairs

Enclosure – D&MP Update No. 1

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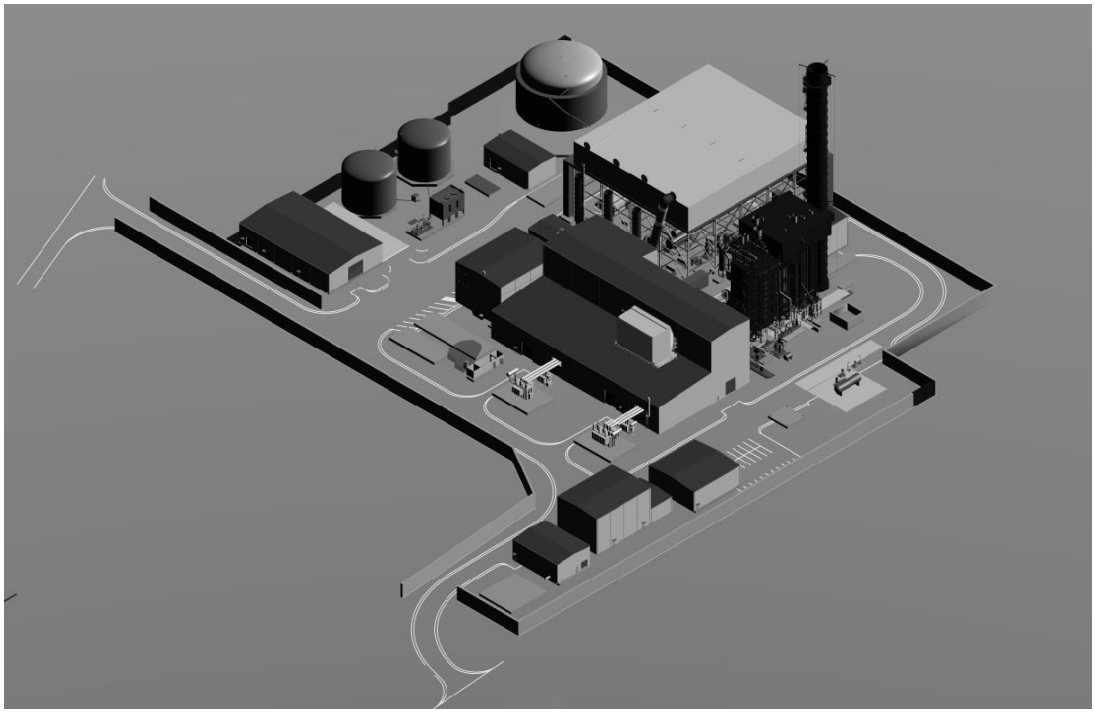
Connecticut Siting Council
Development and Management Plan Update No. 1
Combined Cycle Generating Facility

Bridgeport Harbor Station Unit 5
Bridgeport, Connecticut



Design Revisions

PREPARED FOR:
PSEG POWER CONNECTICUT, LLC

June 29, 2017

Development and Management Plan Update No. 1 Summary:

This Development and Management Plan Update (D&MP Update 1) submittal to the Connecticut Siting Council (CSC) includes limited design revisions. Specifically, it provides detailed plant design data and information for proposed underground utility design and water balance changes for the PSEG Power Connecticut LLC (PSEG) combined cycle generating facility designated Bridgeport Harbor Station Unit 5 (BHS 5, the "Project" or the "Facility").

An initial D&MP submittal (D&MP Phase 1), for construction support facilities was filed with the CSC on September 21, 2016. A second D&MP submittal (D&MP Phase 2) was filed on October 31, 2016. Collectively, these two D&MP documents included the complete design and construction details of the Project as known at that time. The D&MPs were approved by the CSC on October 27, 2016 and December 22, 2016, respectively.

More specifically, the contents of the D&MP filings were based upon the requirements included in the CSC's July 21, 2016 Opinion, Findings of Fact, and Decision and Order. This D&MP Update No. 1, and the previously approved D&MP Phase 1 and D&MP Phase 2, together contain the plans and specifications for compliance with the CSC's conditions as set forth in the Decision and Order.

PSEG has initiated Monthly Progress Reporting to the CSC, as required, to provide status reporting and to submit additional data and information necessary to demonstrate ongoing compliance with the CSC's conditions.

Underground Utilities

PSEG, in consultation with the project Design Engineering firm (SNC-Lavalin), initiated a review of the underground utility design. The focus of this review was to determine if construction efficiencies and functional improvements in the designs could be identified. The review indicated that revisions to the design were appropriate. The result is this D&MP Update No. 1, which includes a proposed revised underground utility design.

The underground utility changes are generally minimal in nature and involve raising the utilities, avoiding potential interferences with foundations and other utilities, and reducing utility runs where possible. The stormwater conveyance system has been relocated to the perimeter of the site to facilitate optimization of other subsurface features. The basic design objectives for the conveyance system have remained the same. The site finished grading includes yard stone, which will serve to provide a drainage pathway to the perimeter.

The changes in the comprehensive underground utility design, as shown in Exhibit 1 generally are layout and elevation / invert changes. The functional elements of the design are unchanged. As the detail designs progressed, areas where improvements could be made were identified and have been incorporated into the revised plans.

As shown on the enclosed plans (Exhibit 1), the stormwater design has been simplified to allow for optimization of the underground utilities for the new combined cycle plant and to allow for easier operation and maintenance of the stormwater conveyance system. The modified design has eliminated the need for catch basins and subsurface piping throughout the center of the Unit

5 power block area. The design, as modified, includes a rock / gravel filled trench using perforated piping as the conveyance system. This drainage system is located along the interior face of the sheet pile retaining wall. The conveyance system will continue to collect stormwater runoff from inside the power block and direct it through the manufactured treatment device (MTD) (Jellyfish Units) for ultimate discharge into Bridgeport Harbor.

The revised design will not result in a change in the Project's Limit of Disturbance (LOD) or an increase in the contributory drainage area being treated by the MTD. The design is expected to result in a reduction in the stormwater discharged through the MTD, as the perimeter collection system design promotes increased storage, transit time, and infiltration from overland flow across the yard stone / gravel areas within the sheet pile wall.

No changes have been made to the design of the MTDs or the stormwater outfall structure that were included in the original stormwater design for the new plant. This is consistent with the design submitted to the CSC in D&MP Phase 2.

To summarize, the underground utility system design has been modified for construction efficiencies and to provide for functional improvements. The stormwater conveyance system has been relocated to the perimeter of the development area within the sheetpile wall. No changes to the previously submitted design of the MTD or outfall were required.

Water Balance Diagram

Similar to the changes in the underground design detailed above and in Exhibit 1, PSEG and SNCL have also conducted a review of the site water balance with the objective of reducing freshwater requirements and wastewater discharges, where possible, for the various plant operating scenarios. The revised water balance diagram and table of operating cases is included as Exhibit 2. The prior water balance was provided in D&MP Phase 2, Exhibit 4.

The proposed changes, while collectively not significant, more accurately represent the anticipated plant operating scenarios. The water balance includes flow path rerouting to accommodate the following:

1. Removing the discharge from the oil water separators (OWS) to the cooling tower;
2. Eliminating the discharge of minor stormwater quantities from exterior containments to the City Water Pollution Control Authority (WPCA) collection system;
3. Improvements in the ability to reuse / reprocess water under certain conditions.

The water balance diagram has been optimized during final design to provide additional operational flexibility, reduce cooling tower and circulating water system fouling potential, and incorporate seasonal variations in cooling tower evaporation rates. The optimized water balance results in a minor reduction in average annual facility water supply requirements and maintains process wastewater discharge flow and quality characteristics within allowable ranges for discharge to the sewer.

Connecticut Siting Council – Development and Management Plan Update No. 1
New Combined Cycle Generating Facility - Bridgeport Harbor Station Unit 5
Docket Petition No. 1218 (Approved July 21, 2016)
June 29, 2016

Exhibits:

1. Facility Design Drawings (specific drawings listed in each Exhibit)

1.A Underground Utilities

1.B Stormwater

2. Water Balance Diagram and Associated Tables

Connecticut Siting Council – Development and Management Plan Update No. 1
New Combined Cycle Generating Facility - Bridgeport Harbor Station Unit 5
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Exhibit 1 - Facility Design Drawings

1.A Underground Utilities

644911-P200	001	Yard Underground Piping Plan
644911-P201	001	Yard Underground Piping Plan Area 1
644911-P202	001	Yard Underground Piping Plan Area 2
644911-P203	001	Yard Underground Piping Plan Area 3
644911-P204	001	Yard Underground Piping Plan Area 4
644911-P205	001	Yard Underground Piping Plan Area 6
644911-P206	001	Yard Underground Piping Plan Area 6
644911-P207	001	Yard Underground Piping Plan Area 7
644911-P208	001	Yard Underground Piping Plan Area 8
644911-P209	001	Yard Underground Piping Plan Area 9
644911-P210	001	Yard Underground Piping Plan Area 10
644911-P211	001	Yard Underground Piping Plan Area 11
644911-P212	001	Yard Underground Piping Plan Area 12
644911-P213	001	Yard Underground Piping Plan Area 13
644911-P214	001	Yard Underground Piping Plan Area 14
644911-P215	001	Yard Underground Piping Plan Area 15
644911-P216	001	Yard Underground Piping Plan Area 16
644911-P217	001	Yard Underground Piping Plan Area 17
644911-P218	001	Yard Underground Piping Plan Area 10
644911-P219	001	Yard Underground Piping Plan Area 19
644911-P220	001	Yard Underground Piping Plan Area 20
644911-P221	001	Yard Underground Piping Plan Area 21
644911-P222	001	Yard Underground Piping Plan Area 22
644911-P223	001	Yard Underground Piping Plan Area 23
644911-P224	001	Yard Underground Piping Plan Area 24
644q11-P225	001	Yard Underground Piping Plan Area 25
644911-P226	001	Yard Underground Piping Plan Area 26
644911-P227	001	Yard Underground Piping Plan Area 27
644911-P230	001	Underground Piping Bedding Details
644911-P231	001	Underground Piping Details
644911-P232	001	Underground Piping Cathodic Protection Details
644911-P233	001	Underground Fire Protection Piping Firewater Loop
644911-P233	002	Underground Fire Protection Piping Sections and Details

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Exhibit 1 - Facility Design Drawings

1.B Stormwater

644911 C003-S001 Stormwater System Drainage – Stormwater Drainage Plan Sheet 1 of 6
644911 C003-S002 Stormwater System Drainage – MTD Layout Sheet 2 of 6
644911 C003-S003 Stormwater System Drainage – Stormwater Drainage Profiles Sheet 3 of 6
644911 C003-S004 Stormwater System Drainage – Sections and Details Sheet 4 of 6
644911 C003-S005 Stormwater System Drainage – Sections and Details Sheet 5 of 6
644911 C003-S006 Stormwater System Drainage – Sections and Details Sheet 6 of 6
644911 C004-S001 Yard Grading – Gravel Subgrade Grading Plan – Sheet 1 of 1
644911 C005-S001, Yard Grading, Surfacing/Final Grading Plan, Sheet 1 of 2
644911 C005-S002, Yard Grading, Surfacing/Final Grading Plan, Sheet 2 of 2
644911 C006-S001, Yard Grading, Roads and Parking Paving Plan, Sheet 1 of 5
644911 C006-S002, Yard Grading, Roads and Parking Paving Plan, Sheet 2 of 5
644911 C006-S003, Yard Grading, Roads and Parking Paving Plan, Sheet 3 of 5
644911 C006-S004, Yard Grading, Roads and Parking Paving Plan, Sheet 4 of 5
644911 C006-S005, Yard Grading, Roads and Parking Paving Plan, Sheet 5 of 5
644911 SK008-S001, Stormwater System Design, Drainage Areas, Sheet 1 of 1

Connecticut Siting Council – Development and Management Plan Update No. 1
New Combined Cycle Generating Facility - Bridgeport Harbor Station Unit 5
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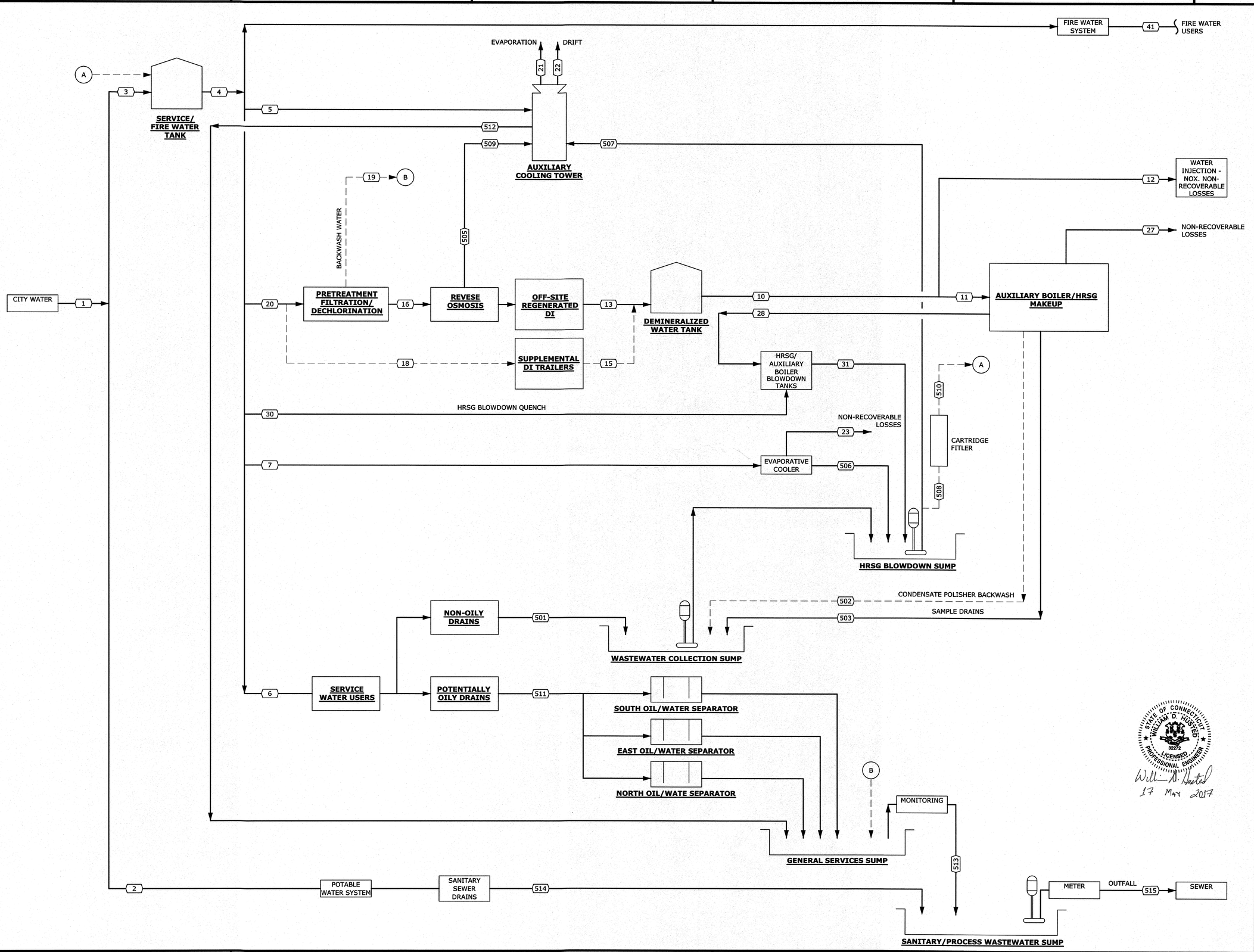
Exhibit 2 - Water Balance

644911-FD002 Sheet 001 Water System Process Flow Diagram - Sheet 1 of 2
644911-FD002 Sheet 002 Water System Water Mass Balance - Sheet 2 of 2



GENERAL NOTES:

1. THE INTENT OF THIS DIAGRAM IS TO SHOW THE MAJOR WATER AND WASTEWATER FLOWS.
2. REFER TO 644911-FD002-S002 FOR STREAM FLOW DATA.
3. DASHED LINES REPRESENT INTERMITTENT FLOWS.

ORIGINAL

PRELIMINARY
NOT FOR CONSTRUCTION

STATE OF CONNECTICUT WILLIAM D. HUSTED 32272 LICENSED PROFESSIONAL ENGINEER
17 May 2017

ISSUED FOR APPROVAL

REVISION	DATE	BY	CHECKED	APPROVED	PROJ. TECH.	DIR. TECH.	PROJ. MGR.
A	5/17/17		WDH	WDH			

PROJECT ENGINEERING DIVISION
PSEG Power Connecticut LLC

SNC•LAVALIN CONSTRUCTORS INC.

SCALE:

BRIDGEPORT 05

WATER SYSTEM
PROCESS FLOW DIAGRAM
SHT 1 OF 2

FLOW DIAGRAM — DESIGN PIPING

VENDOR NO. 644911-FD002-S001

REV A

REVIEW/ SEEN BY: INSTR | ELECT | MECH | STRUCT | PIPING | PROCESS

Stream no.	Description	Unit	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	CASE 6	Remarks
			NG, EC off, DF Off, 100% GT load	NG, EC ON, DF ON, 100% GT load	USLD, EC off, DF Off, 100% GT load	NG, EC ON, DF ON, 100% GT load	NG, EC ON, DF ON, 100% GT load	USLD, EC OFF DF ON, 100% GT load	
	Ambient temperature		59 F / 60% RH	90 F / 70% RH	35 F / 50% RH	90 F / 70% RH	59 F / 60% RH	35 F / 50% RH	
	HRSG & Heat balance Case no.		Case 1 (HRSG) & Heat balance CCA20095	Case 2 (HRSG performance) & Heat balance CCA20081	Case 3 (HRSG) & Heat balance CCA20139	Case 4 (HRSG) & Heat balance CCA20081	Case 5 (HRSG) & Heat balance CCA20004	Case 6 (HRSG) & Heat balance CCA20138	
1	City water supply	gpm	126	173	626	172	148	630	NOTE 2, 3
2	Potable water network	gpm	2	2	2	2	2	2	
3	Supply to Service/Fire water tank	gpm	124	171	624	170	146	628	
4	service water demand	gpm	124	171	623	170	146	628	
5	Service water makeup to CT makeup	gpm	70	83	47	83	64	43	
6	Service water for misc uses	gpm	10	10	10	10	10	10	
7	Supply to CTG evap cooler	gpm	0	23	0	23	20	0	
	Total steam rate	lb/h	821,700	1,032,100	812,500	1,028,000	993,100	1,002,500	
11	Boiler makeup	gpm	29	36	28	36	35	35	
12	Nox Water	gpm	0	0	509	0	0	509	
10	Total demin water	gpm	29	36	537	36	35	544	
13	Leased RO/DI trailers, permeate	gpm	0	36	110	36	35	110	
15	Supplement DI trailer, min flow	gpm	0	0	427	0	0	434	
16	Leased RO/DI trailers, feed	gpm	34	36	110	42	41	129	
18	Supplement DI trailer, feed	gpm	0	0	427	0	0	434	
19	Water pretreatment backwash	gpm	1	1	1	1	1	1	
20	Total supply to water treatment	gpm	35	43	558	43	42	564	
21	CT evaporation	gpm	86	103	68	103	86	68	
	CT makeup from all sources	gpm	103	126	94	126	105	94	
	CT Cycles of concentration		6.0	5.5	3.6	5.5	5.5	3.6	
22	CT Drift	gpm	0.1	0.1	0.1	0.1	0.1	0.1	
23	CTG evap cooler evaporation	gpm	0	19	0	19	17	0	
27	Misc loses from w/s cycle	gpm	8.0	11.2	7.9	11.1	10.6	10.7	
28	HRSG blowdown	gpm	16	21	16	21	20	20	1% Blowdown
	Blowdown, after flashing	gpm	10	12	10	12	12	12	
30	Quench water, gpm	gpm	9	11	9	11	11	11	
31	To blowdown sump	gpm	19	24	19	24	23	23	NOTE 4
41	Fire water system	gpm	0	0	0	0	0	0	
501	Non oily wastewater	gpm	5	5	5	5	5	5	
502	Condensate polisher backwash	gpm	0.3	0.3	0.3	0.3	0.3	0.3	
503	sample panel drains	gpm	4	4	4	4	4	4	
505	RO reject	gpm	5	6	19	6	6	19	NOTE 5
506	Evaporative cooler blowdown	gpm	0	4	0	4	3	0	NOTE 6
	Total from blowdown sump	gpm	28	37	28	37	35	32	
507	Recycle to CT basin from BD sump	gpm	28	37	28	37	35	32	
508	To cartridge filters	gpm	0	0	0	0	0	0	
509	RO reject to CT	gpm	5	6	19	6	6	19	
510	Recycle to S/F water tank	gpm	0	0	0	0	0	0	
511	Oily wastewater	gpm	5	5	5	5	5	5	
512	CT blowdown	gpm	17	23	26	23	19	26	
512	Temperature	degree F	67	88	54	88	67	54	
512	Total dissolved solids	mg/l	828	869	871	868	889	863	
512	Total suspended solids	mg/l	6	5	3	5	5	3	
513	CT blowdown, oily ww and filter backwash	gpm	23	29	32	29	25	32	
514	Sanitary wastewater	gpm	2	2	2	2	2	2	
515	Total wastewater	gpm	25.2	30.9	34.2	30.9	27.1	34.2	
515	Temperature	degree F	65	81	55	81	65	55	
515	Total dissolved solids	mg/l	704	757	770	757	756	763	
515	Total suspended solids	mg/l	10	8	7	8	9	7	

GENERAL NOTES:

1. INDICATED FLOWS RATES MAY NOT BALANCE DUE TO ROUNDING.
2. ASSUMED WORST CASE 0.135 mg/l ZINC IN CITY WATER.
3. CITY WATER QUALITY OF 128 mg/l TOTAL DISSOLVED SOLIDS, 1 mg/l TOTAL SUSPENDED SOLIDS. AVERAGE TEMPERATURE 60 DEGREE F.
4. QUENCHED BLOWDOWN TEMPERATURE EQUAL OR LESS THAN 140 DEGREES F.
5. RO REJECT TOTAL DISSOLVED SOLIDS APPROXIMATELY 790 mg/l REPRESENTING 85% RO RECOVERY.
6. 6 CYCLES OF CONCENTRATION. CTG EVAPORATIVE COOLER BLOWDOWN'S TOTAL DISSOLVED SOLDS APPROXIMATELY 730 mg/l.

STATE OF CONNECTICUT
WILLIAM D. HUSTED
32272
LICENSED PROFESSIONAL ENGINEER

17 MAY 2017

ORIGINAL

PRELIMINARY
NOT FOR CONSTRUCTION

ISSUED FOR APPROVAL

REVISION	DATE	BY	CHECKED	APPROVED	PROJ. TECH.	DIR. TECH.	PROJ. MGR.
A	5/17/17	MW	WDH	WDH	JF	JF	

PROJECT ENGINEERING DIVISION
PSEG Power Connecticut LLC

SNC•LAVALIN CONSTRUCTORS INC.

SCALE:

BRIDGEPORT 05

WATER SYSTEM
WATER MASS BALANCE
SHT 2 OF 2

FLOW DIAGRAM — DESIGN PIPING

VENDOR NO.
644911-FD002-S002
REV A

INSTR | ELECT | MECH | STRUCT | PIPING | PROCESS | REVIEW/ SEEN BY