



CERTIFIED MAIL
RETURN RECEIPT REQUESTED

June 15, 2016

Ms. Beverley Carver
Department of Environmental Quality
Valley Regional Office
441 Early Road
Harrisonburg, VA 22801

Re: Dominion – Bremo Power Station – VA0004138
Concept Engineering Report for the West Treatment Pond

Dear Ms. Carver:

Enclosed is a Concept Engineering Report (CER) that describes the West Treatment Pond that Dominion is proposing to construct at Bremo Power Station for the treatment of process waters related to station operations. Wastewater treated by the West Treatment Pond will be discharged via permitted Outfall 002.

This CER is being submitted in accordance with Special Condition I.G.5 of the subject permit. As such, we are seeking DEQ approval of the CER so that we might initiate construction of the treatment system as proposed.

If you have any questions regarding this request, please contact Ken Roller of Dominion Electric Environmental Services at (804) 273-3494.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

A handwritten signature in cursive script that reads "Paula A. Hamel".

Paula A. Hamel
Director, Generation Environmental Services



CONCEPT ENGINEERING REPORT: WEST TREATMENT POND

Bremo Power Station



Dominion

Submitted To: Virginia Electric and Power Company
1038 Bremo Road
Bremo Bluff, VA 23022

Submitted By: Golder Associates Inc.
2108 W. Laburnum Avenue
Suite 200
Richmond, VA 23227



June 2016

1520-347.300

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Drawings

- Drawing 1 – Site Location Map
- Drawing 2 – Site Plan
- Drawing 3 – Process Flow Diagram – During Closure
- Drawing 4 – Process Flow Diagram – Final Conditions
- Drawing 5 – West Treatment Pond Modification Plan
- Drawing 6 – West Treatment Pond Modification Details

1.0 INTRODUCTION

This Concept Engineering Report (CER) has been prepared for the proposed West Treatment Pond at Dominion's Bremo Power Station (Station), located in Fluvanna County, Virginia. The Station converted from a coal-fired power plant to a natural gas-fired power plant in 2014. Coal Combustion Residuals (CCR) from historical coal-fired operations are stored in three impoundments on-site (North Ash Pond, West Ash Pond, and East Ash Pond). Process water from these ponds and other Station activities has historically been discharged with contact stormwater to the James River pursuant to the authorization, limits, and conditions of a Virginia Department of Environmental Quality (DEQ) Virginia Pollutant Discharge Elimination System (VPDES) Permit (Permit No. VA0004138).

Dominion is preparing to close these three CCR surface impoundments in response to the U.S. Environmental Protection Agency's (EPA's) publication of the Federal Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule (40 CFR 257). During closure activities of these three CCR impoundments, Dominion will also close the Metals Pond by dewatering and removing accumulated solids. Dominion has prepared this CER to provide a description of the proposed West Treatment Pond, which is expected to be brought on-line following DEQ approval of this CER.

1.1 Site Description

The Bremo Power Station is owned and operated by Virginia Electric and Power Company (Dominion) in Fluvanna County, Virginia, at 1038 Bremo Road, just east of Route 15 (James Madison Highway) and north of the James River. The location of the Station is illustrated on the inset United States Geological Survey (USGS) topographic map on Drawing 1. A Site Plan is presented on an aerial photograph as Drawing 2. The Station property consists of wooded, open, and developed land just north of the James River. The Station's northern, eastern, and western boundaries are bordered by primarily undeveloped parcels, and the Station is bordered to the south by a CSX rail line and the James River. Land use surrounding the Station is classified as "A-1 Agricultural," and consists of undeveloped wooded and agricultural properties within a rural residential setting.

2.0 WASTEWATER SOURCES

The Process Flow Diagram on Drawing 3 depicts the wastewater sources to the proposed West Treatment Pond during the closure activities for the West (western portion), North, and East Ash Ponds, and the Metals Pond. Drawing 4 is a Process Flow Diagram showing the final wastewater sources after the closure activities are complete. These wastewater sources are described below.

2.1 During Closure

The following wastewater sources are expected to be routed to the West Treatment Pond during the closure activities for the CCR impoundments and Metals Pond, as shown on Drawing 3.

2.1.1 Metals Pond Pumped Decant Water

Metals Pond Pumped Decant Water is surface water that has accumulated in the Metals Pond and needs to be removed as an initial step to facilitate closure. In the past, this water was periodically pumped to the West Ash Pond via internal outfall 202 for ultimate discharge to the James River via outfall 002.

Decanting shall be accomplished by pumping the decant water to the centralized source water treatment system (CSWTS) for treatment prior to discharge via internal outfall 504 or external outfall 002 via the West Treatment Pond. Alternatively, the Metals Pond Pumped Decant Water may be transported off-site for treatment and/or disposal at a permitted facility.

2.1.2 Metals Pond Contact Stormwater

Metals Pond Contact Stormwater is stormwater that, following removal of the decant water, has contacted the accumulated material in the Metals Pond during closure of the Metals Pond. Metals Pond Contact Stormwater will need to be removed from the Metals Pond to facilitate closure. The Metals Pond Contact Stormwater will be routed to the CSWTS for treatment prior to discharge via internal outfall 504 or external outfall 002 via the West Treatment Pond. Alternatively, the Metals Pond Contact Stormwater may be transported off-site for treatment and/or disposal at a permitted facility.

2.1.3 Metals Pond Material Dewatering Water

Metals Pond Material Dewatering Water is the water that will be produced from dewatering the accumulated material in the Metals Pond to allow for its removal and off-site disposal. This waste stream will be directed to the CSWTS for treatment prior to discharge through internal outfall 504 or external outfall 002 via the West Treatment Pond, or may be transported off-site for disposal at a permitted facility.

2.1.4 Ash Pond Decant Water

Ash Pond Decant Water includes surface waters that result from the commingling of a number of wastewater types, historically including but not necessarily limited to the following: ash pond contact stormwater, low-volume Station wastewater, sewage treatment plant discharges, ash dewatering water, and waters that are used to convey CCR to an impoundment through sluicing or dredging. As an initial step in the process leading to closure of the ash impoundments, it will be necessary to remove the Ash Pond Decant Water to dewater the CCR sufficiently to allow for preparation of a stable surface on which to construct the closure cap, or to initiate CCR removal). Ash Pond Decant Water will be routed to the CSWTS for treatment and discharge through internal outfall 504 or external outfall 002 via the West Treatment Pond, or transported off-site for disposal at a permitted facility.

2.1.5 Ash Pond Contact Stormwater

Ash Pond Contact Stormwater is stormwater that has contacted the CCR in the North, East, and West Ash Ponds, and is considered process wastewater. This waste stream will be directed to the CSWTS for treatment prior to discharge through internal outfall 504 or external outfall 002 via the West Treatment Pond, or transported off-site for disposal at a permitted facility.

2.1.6 Ash Pond Ash Dewatering Water

Ash Pond Ash Dewatering Water is considered to be the pore water within the CCR mass in the West, North, and East Ash Ponds. This wastewater refers to the water that is produced from dewatering the CCR to stabilize the CCR and allow for its removal by mechanical dredging or excavation, or to support a closure cap system. Ash Pond Ash Dewatering Water is generated from the CCR dewatering process through mechanical means (e.g., vacuum wells, sump pumps, or other *in situ* withdrawal methods) and from cutting drainage ditches and/or rim ditches into the CCR mass. Ash Pond Ash Dewatering Water will be directed to the CSWTS for treatment prior to discharge through internal outfall 504 or external outfall 002 via the West Treatment Pond, or transported off-site for disposal at a permitted facility.

2.1.7 Stormwater Treatment Pond Discharge

Discharge from the Stormwater Treatment Pond is a potential wastewater source for the West Treatment Pond during the closure activities for the North, East, and West Ash Ponds and the Metals Pond. Flow from the Stormwater Treatment Pond is currently being discharged directly to Outfall 002 following filtration. Once the West Treatment Pond is constructed, the Stormwater Treatment Pond will be directed to the West Treatment Pond for solids removal via settling prior to discharge through Outfall 002.

2.2 Final Conditions

The post-closure wastewater sources to the West Treatment Pond are shown on Drawing 4. After closure of the CCR impoundments and Metals Pond, the discharge from the Stormwater Treatment Pond will continue to be directed to the West Treatment Pond for treatment via settling. Some Station process waters, low-volume waste and auxiliary process water may also be intermittently directed to the West Treatment Pond.

3.0 WEST TREATMENT POND CONSTRUCTION

Following removal of the CCR, the re-purposed eastern portion of the former West Ash Pond will be lined with a 40-mil Ethylene Interpolymer Alloy (EIA) geomembrane liner system (XR-5) and placed back in service as the West Treatment Pond with a discharge via outfall 002 (see Drawings 5 and 6 - West Treatment Pond Modification Plan and Details). Construction of the West Treatment Pond will involve removing the CCR and certifying the remaining soil subgrade as "clean closed." CCR removal will be considered complete based on a visual inspection determining the absence of CCR, followed by excavating an additional 6 inches from the former West Ash Pond's footprint.

A new earthen fill embankment will be constructed across the pond to form the new western embankment of the West Treatment Pond to a crest elevation of 234.0 feet above mean sea level (ft amsl). Additional soil fill will be placed on the interior slopes of the existing embankments to flatten the slopes from 2H:1V to 3H:1V and to add an 8-foot-wide safety bench at elevation 228.0 ft amsl. Once the West Treatment Pond embankments are complete, the remainder of the former West Ash Pond and Metals Pond embankments will be removed, and the remainder of the former pond area to the west of the new West Treatment Pond will be graded to drain and seeded.

The existing concrete intake tower will be modified slightly to eliminate the removable stop logs and install a permanent discharge weir crest at elevation 230.0 ft amsl. The outlet weir will have a crest length of 5.5 feet. The existing 42-inch diameter corrugated metal pipe outlet at the base of the tower will remain and continue to the James River through a series of junction boxes, manholes, and pipes via outfall 002. As part of the pond closure project, it is planned to slip-line this pipe to increase its longevity.

The XR-5 liner will be underlain by an 8-ounce non-woven cushion geotextile installed over a prepared and inspected subgrade in accordance with the project specifications. Penetrations into the pond liner for the 10-inch diameter stormwater discharge pipe and the 8-inch diameter process water pipe from the station will be secured and booted to provide a watertight seal. The liner will also be connected to the concrete outlet tower near the base of the tower using a batten strip connection for water tightness. Construction Quality Assurance (CQA) oversight during construction will be carried out by third-party inspectors in accordance with the approved CQA Plan. Documentation of the installation, including liner and geotextile deployment, nondestructive and destructive seam testing, repairs, and surveyed record drawings, will be prepared and certified by a licensed professional engineer.

3.1 West Treatment Pond Capacity

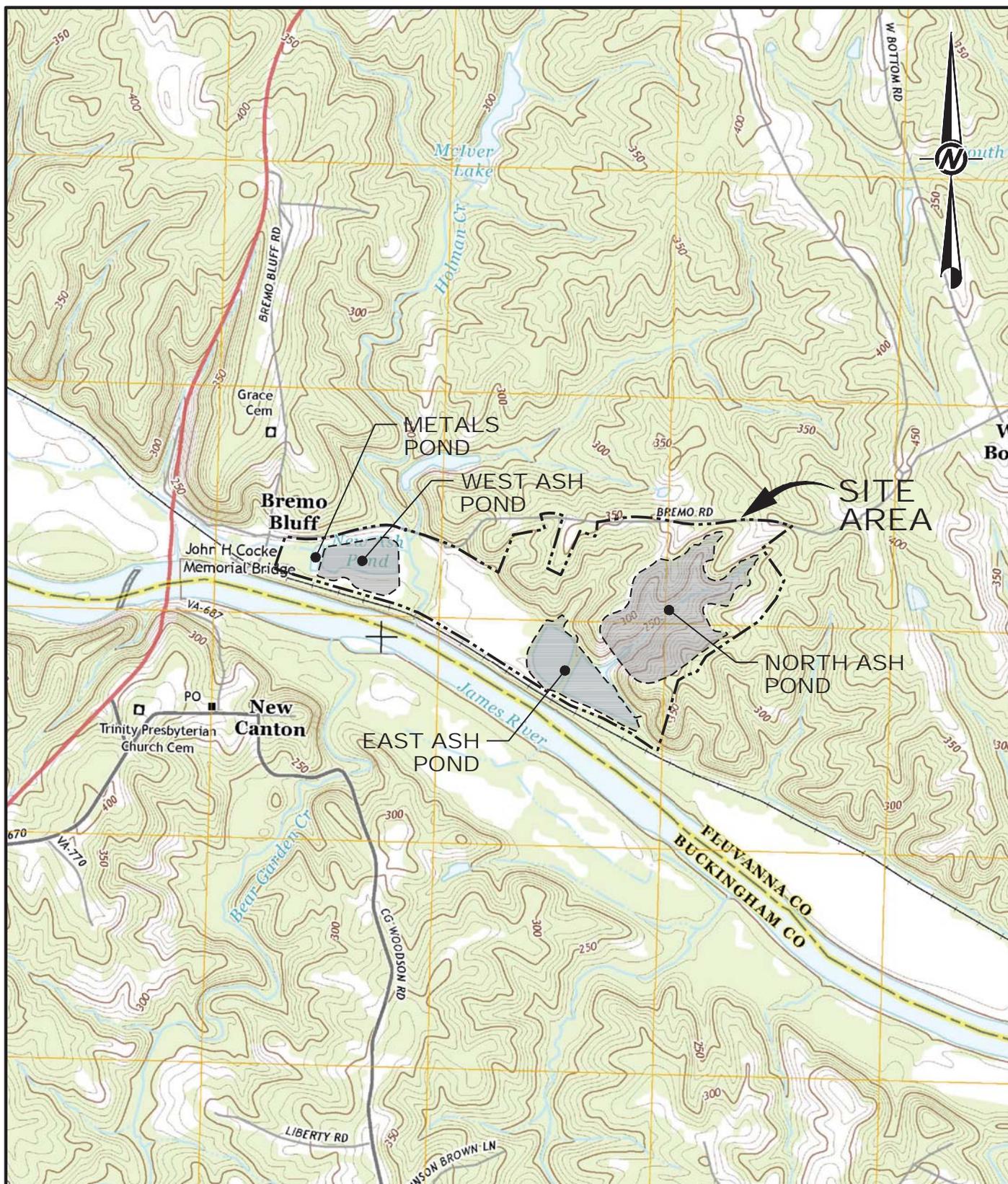
Once constructed, the normal pool volume of the West Treatment Pond will be approximately 19,875,000 gallons as measured at the spillway crest (elevation 230.0 ft amsl). At normal pool, the pond has a freeboard of 4 feet. The pond does not have a contributing drainage area other than the pond area itself, approximately 5.9 acres, so stormwater inflows from large storm events are limited to what falls within the pond. The modeled high water level for the 24-hour, 100-year storm event is elevation 231.0 ft amsl.

3.2 Dam Safety

Due to the capacity of the West Treatment Pond being greater than 50 acre-feet (16,300,000 gallons), the West Treatment Pond is regulated under the Virginia Department of Conservation and Recreation (DCR) Dam Safety Program. The West Treatment Pond is anticipated to receive a Hazard Potential Classification of "Low" once construction is complete. Requirements under the DCR certificate include annual inspections, inspection by a licensed professional engineer every 6 years, maintenance of an emergency preparedness plan, and development of breach inundation maps.

DRAWINGS

G:\Plan Production Data Files\Drawing Data Files\15-20347N - CER Water Treatment\Active Drawings\1520347N01.dwg



REFERENCE

BASE MAP CONSISTS OF 7.5-MINUTE USGS TOPOGRAPHIC QUADRANGLE NAMED ARVONIA, VIRGINIA, DATED 2013.



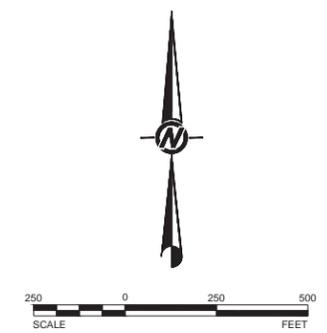
 Golder Associates Richmond, Virginia	DATE	12/18/15	TITLE	<h2>SITE LOCATION MAP</h2>
	DESIGN	JRD		
	CADD	BPG		
PROJECT No.	15-20347	CHECK	DPM	<h3>DOMINION - BREMO POWER STATION</h3>
SCALE	AS SHOWN	REVIEW	JRD	

C:\Plan Production Data Files\Drawing Data Files\15-20347H - Permit Application Amendment\Active Drawings\1520347H02.dwg | Layout: 2 EXISTING OUTFALL LOCATION MAP | Modified: abmartin 09/23/2015 3:34 PM | Plotted: abmartin 08/25/2015



LEGEND

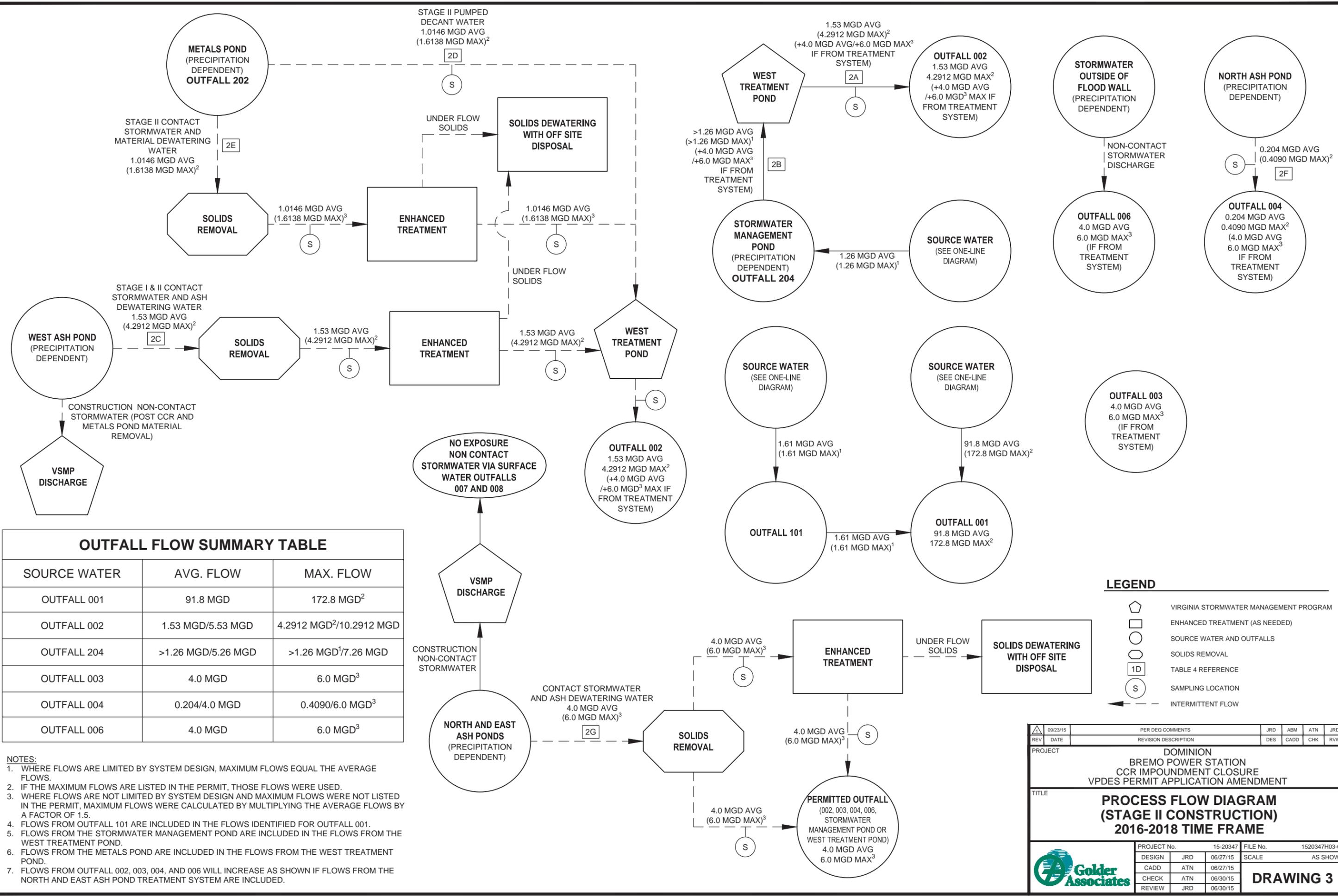
	- APPROXIMATE PROPERTY BOUNDARY
	- APPROXIMATE LIMITS OF ASH POND
	- OUTFALL CONVEYANCE SYSTEM



REV	DATE	PER DEQ COMMENTS	JRD	ABM	ATN	JRD
		REVISION DESCRIPTION	DES	CADD	CHK	RVV
PROJECT						
DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE VPDES PERMIT APPLICATION AMENDMENT						
TITLE						
SITE PLAN						
PROJECT No. 15-20347			FILE No. 1520347H02			
DESIGN	JRD	06/27/15	SCALE		AS SHOWN	
CADD	ATN	06/27/15				
CHECK	ATN	06/30/15				
REVIEW	JRD	06/30/15				
DRAWING 2						



C:\Plan Production Data Files\15-20347\15-20347.dwg | Layout: SHF 5 | Modified: abmarin 09/25/2015 11:32 AM | Plotter: abmarin 09/25/2015



OUTFALL FLOW SUMMARY TABLE

SOURCE WATER	AVG. FLOW	MAX. FLOW
OUTFALL 001	91.8 MGD	172.8 MGD ²
OUTFALL 002	1.53 MGD/5.53 MGD	4.2912 MGD ² /10.2912 MGD
OUTFALL 204	>1.26 MGD/5.26 MGD	>1.26 MGD ¹ /7.26 MGD
OUTFALL 003	4.0 MGD	6.0 MGD ³
OUTFALL 004	0.204/4.0 MGD	0.4090/6.0 MGD ³
OUTFALL 006	4.0 MGD	6.0 MGD ³

- NOTES:**
- WHERE FLOWS ARE LIMITED BY SYSTEM DESIGN, MAXIMUM FLOWS EQUAL THE AVERAGE FLOWS.
 - IF THE MAXIMUM FLOWS ARE LISTED IN THE PERMIT, THOSE FLOWS WERE USED.
 - WHERE FLOWS ARE NOT LIMITED BY SYSTEM DESIGN AND MAXIMUM FLOWS WERE NOT LISTED IN THE PERMIT, MAXIMUM FLOWS WERE CALCULATED BY MULTIPLYING THE AVERAGE FLOWS BY A FACTOR OF 1.5.
 - FLOWS FROM OUTFALL 101 ARE INCLUDED IN THE FLOWS IDENTIFIED FOR OUTFALL 001.
 - FLOWS FROM THE STORMWATER MANAGEMENT POND ARE INCLUDED IN THE FLOWS FROM THE WEST TREATMENT POND.
 - FLOWS FROM THE METALS POND ARE INCLUDED IN THE FLOWS FROM THE WEST TREATMENT POND.
 - FLOWS FROM OUTFALL 002, 003, 004, AND 006 WILL INCREASE AS SHOWN IF FLOWS FROM THE NORTH AND EAST ASH POND TREATMENT SYSTEM ARE INCLUDED.

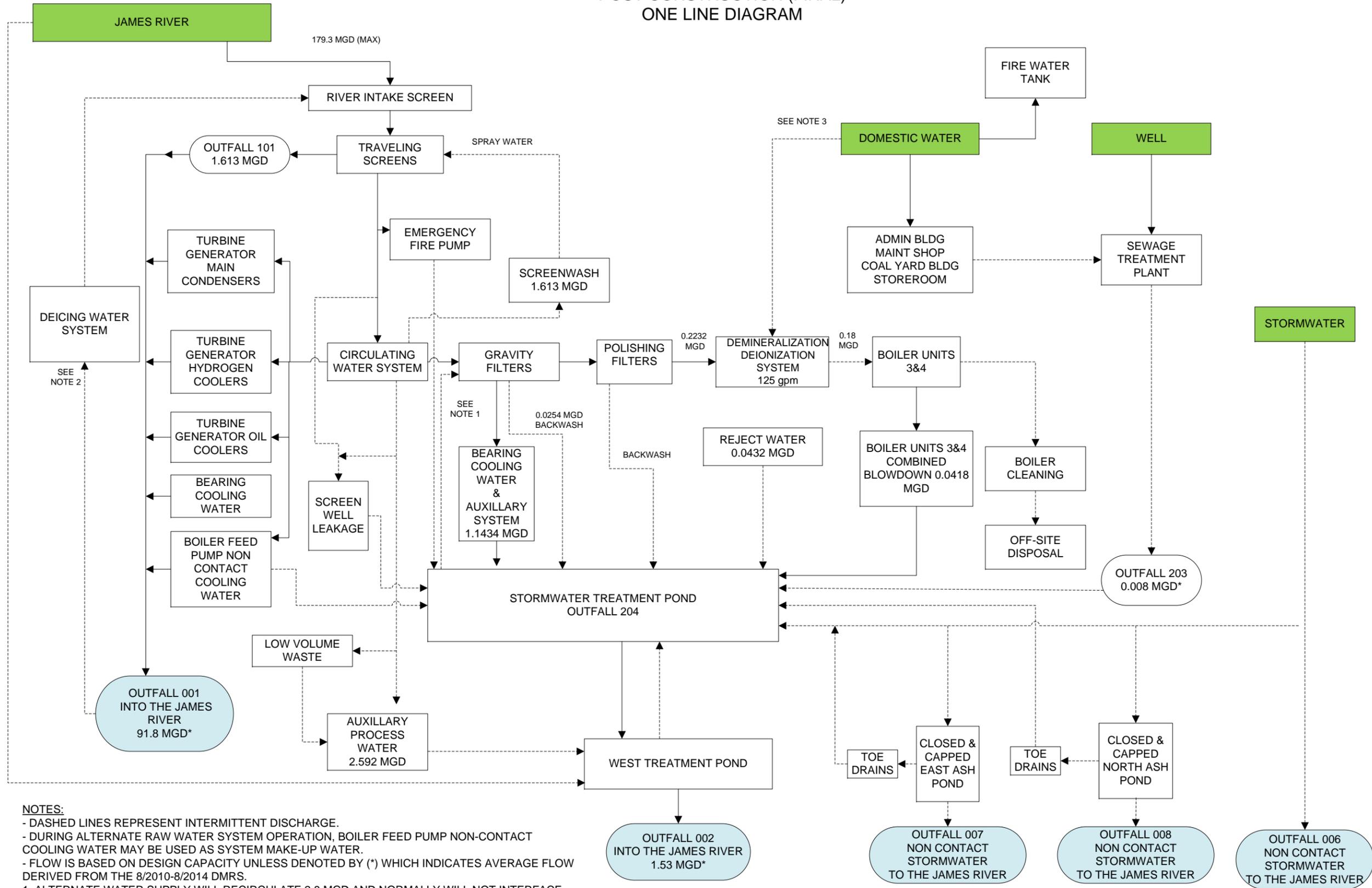
LEGEND

- VIRGINIA STORMWATER MANAGEMENT PROGRAM
- ENHANCED TREATMENT (AS NEEDED)
- SOURCE WATER AND OUTFALLS
- SOLIDS REMOVAL
- TABLE 4 REFERENCE
- SAMPLING LOCATION
- INTERMITTENT FLOW

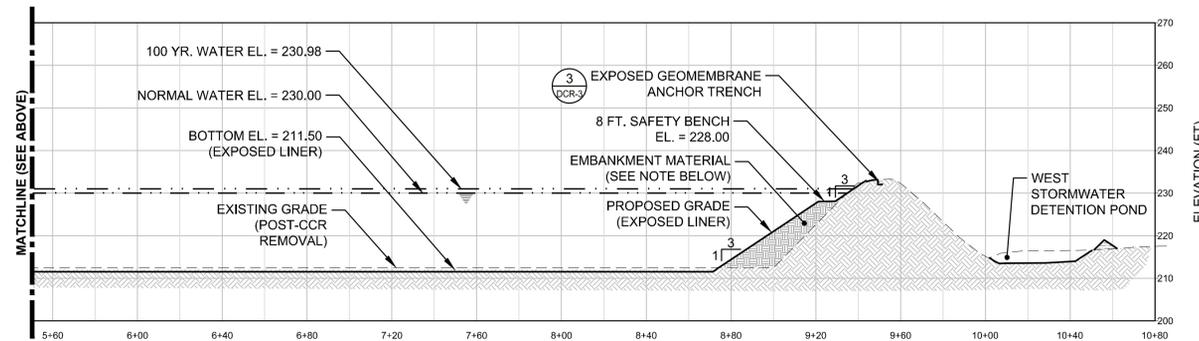
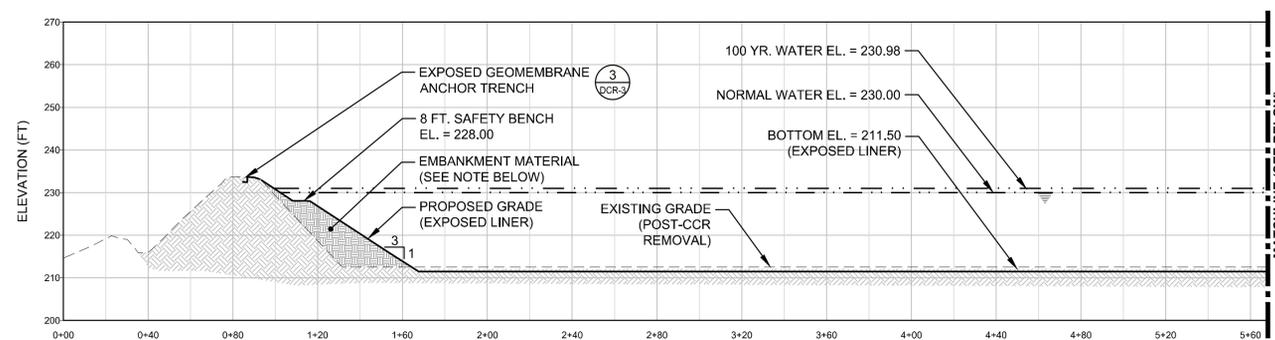
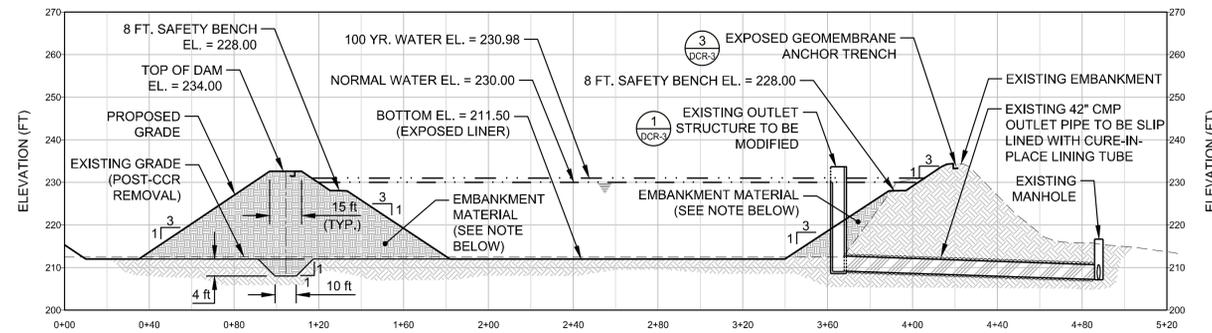
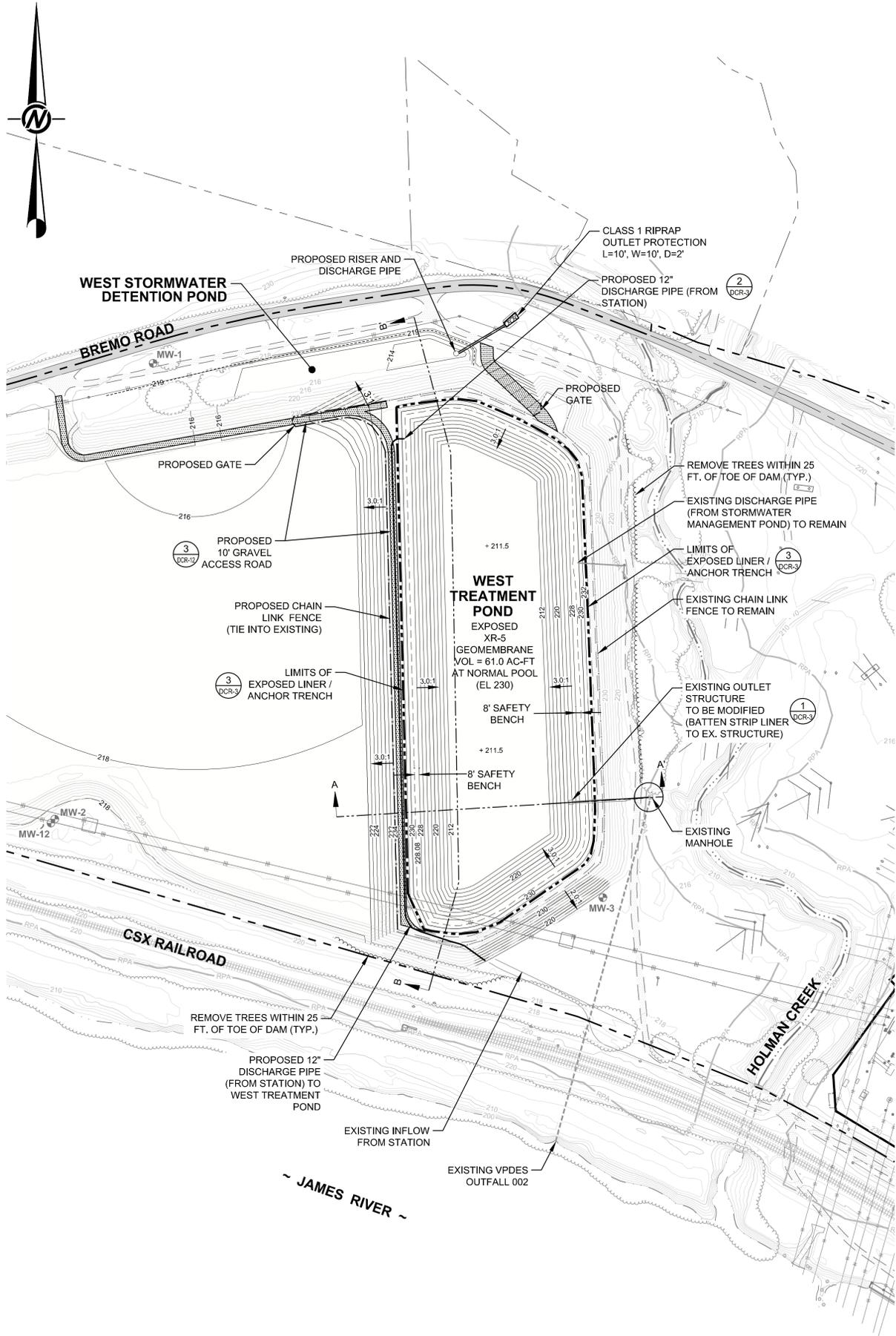
09/23/15	PER DEQ COMMENTS	JRD	ABM	ATN	JRD
REV	DATE	DES	CADD	CHK	RVV
PROJECT: DOMINION BREMO POWER STATION CCR IMPOUNDMENT CLOSURE VPDES PERMIT APPLICATION AMENDMENT					
TITLE: PROCESS FLOW DIAGRAM (STAGE II CONSTRUCTION) 2016-2018 TIME FRAME					
PROJECT No.	15-20347	FILE No.	1520347H03-05		
DESIGN	JRD	06/27/15	SCALE	AS SHOWN	
CADD	ATN	06/27/15	DRAWING 3		
CHECK	ATN	06/30/15			
REVIEW	JRD	06/30/15			



**BREMO POWER STATION
STATION WATER FLOW
POST CONSTRUCTION (FINAL)
ONE LINE DIAGRAM**



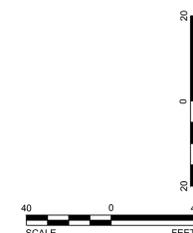
- NOTES:**
- DASHED LINES REPRESENT INTERMITTENT DISCHARGE.
 - DURING ALTERNATE RAW WATER SYSTEM OPERATION, BOILER FEED PUMP NON-CONTACT COOLING WATER MAY BE USED AS SYSTEM MAKE-UP WATER.
 - FLOW IS BASED ON DESIGN CAPACITY UNLESS DENOTED BY (*) WHICH INDICATES AVERAGE FLOW DERIVED FROM THE 8/2010-8/2014 DMRS.
1. ALTERNATE WATER SUPPLY WILL RECIRCULATE 2.8 MGD AND NORMALLY WILL NOT INTERFACE WITH RIVER.
 2. DEICING WATER IS USED ONLY DURING SEVERE COLD WEATHER.
 3. COUNTY WATER IS USED WHEN RIVER WATER IS TOO TURBID FOR USE AS MAKE-UP WATER.



EMBANKMENT MATERIAL NOTE

THE EMBANKMENT SOILS ARE SPECIFIED TO BE LOW TO MODERATE PLASTICITY SOIL (PI LESS THAN 30), GENERALLY FREE OF ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS AND ROCK FRAGMENTS LARGER THAN 2 INCHES IN ANY DIMENSION. EMBANKMENT SOILS WILL BE COMPACTED IN LIFTS TO AT LEAST 95% OF STANDARD PROCTOR DRY DENSITY. SEE TECHNICAL SPECIFICATIONS FOR COMPLETE MATERIAL DESCRIPTION, INSTALLATION, AND TESTING REQUIREMENTS.

WEST TREATMENT POND PLAN



Goldier Associates

PROJECT	DOMINION BREMO POWER STATION CCR SURFACE IMPOUNDMENT WEST TREATMENT POND CER FLUVANNA COUNTY, VIRGINIA
TITLE	WEST TREATMENT POND MODIFICATION PLAN
PROJECT No.	15-20347
FILE No.	1520347N02
REV. 0	SCALE AS SHOWN
DESIGN	JRD 02/05/15
CADD	ATN 02/05/15
CHECK	
REVIEW	

DRAWING 5

