

Approved Design Capacity for Grant Funding Under the Bay Restoration Fund

Purpose:

The purpose of this document is to provide clarification and documentation of Maryland Department of the Environment's definition of "Approved Design Capacity" for the purposes of funding of wastewater treatment plant upgrades under the Bay Restoration Fund (BRF).

Authority:

Section 1605.2 of Chapter 9 of Environment Article authorizes Maryland Department of the Environment to utilize funds generated from the Bay Restoration Fund assessed fees to upgrade wastewater treatment plants with enhanced nutrient removal technology. This section provided specific instructions regarding funding eligibility being limited to the approved design capacity of the wastewater treatment plants. Specifically, §9-1605.2(i), titled "Use of Fund," states:

"(2) Funds in the Bay Restoration Fund shall be used only:

- (i) To award grants for up to 100% of eligible costs of projects relating to planning, design, construction, and upgrade of a wastewater facility for flows up to the design capacity of the wastewater facility, as approved by the Department, to achieve enhanced nutrient removal in accordance with paragraph (3) of this subsection;"*

Design Capacity:

The Department is using the design capacity identified in the Maryland Chesapeake Bay Tributary Strategy for the purpose of determining the Maryland Bay nutrient loading caps as the approved design capacity of a wastewater treatment facility. The approved design capacity is defined as follows:

Design capacity for significant facilities shall meet the following two conditions:

- (1) A discharge permit was issued based on the plant capacity, or a letter was issued by MDE to the jurisdiction with design effluent limits based on the new capacity as of April 30, 2003.*
- (2) Planned capacity was either consistent with the MDE-approved County Water and Sewer Plan as of April 30, 2003, or shown in the locally-adopted Water and Sewer Plan Update or Amendment to the County Water and Sewer Plan, which were under review by MDE as of April 30, 2003.*

The first draft of this definition was issued in May, 2003 to fulfill the requirements of an Executive Order, issued in November 2002 by former Governor Glendening, requiring MDE to develop the State's Enhanced Nutrient Removal Strategy. Although the basic content of the definition has not changed since the first draft, the original language has been modified in response to comments in order to clarify the specific intent.

In most cases, the approved design capacity exceeds the current plant flow because facility owners design and build facilities to last at least 20 years in the future and have built capacity sufficient to meet expected needs over that time frame. In other cases, facility owners were in the process of upgrading and expanding facilities and had invested significant funding into the design of a new facility prior to the announcement of the Enhanced Nutrient Removal (ENR) Strategy and the revised Chesapeake Bay nutrient loading caps. No additional capacity beyond these levels has been approved by the Department since April 30, 2003, when the caps were established, however, in some situations, data obtained by the Department has been found to be in error and design capacities have been revised in accordance with the basic principal that approved design capacity meets the requirements specified above.

The following is the list of the Approved Design Capacity, in million gallons per day (MGD) as was determined by the Department for each of the 66 targeted facilities based on above criteria:

Facility	Approved Design Flow (MGD)
Aberdeen	4.000
Annapolis	13.000
APG – Aberdeen	2.800
Back River	180.000
Ballenger	6.000
Blue Plains (MD Share)	169.600
Bowie	3.300
Broadneck	6.000
Broadwater	2.000
Brunswick	1.400
Cambridge	8.100
Celenese	2.000
Centreville	0.500
Chesapeake Beach	1.500
Chestertown	1.500
Conococheague	4.100
Cox Creek	15.000
Crisfield	1.000
Cumberland	15.000
Damascus	1.500
Delmar	0.850
Denton	0.800
Dorsey Run	2.000
Easton	4.000
Elkton	3.050
Emmitsburg	0.750
Fedralsburg	0.750
Frederick	8.000
Freedom District	3.500
Fruitland	0.800
George Creek	0.600
Hagerstown	8.000
Havre de Grace	2.275

Facility	Approved Design Flow (MGD)
Hurlock	1.650
Indian Head	0.500
Joppatowne	0.950
Kent Island	3.000
La Plata	1.500
Leonardtown	0.680
Little Patuxent	25.000
Marley-Taylor	6.000
Maryland City	2.500
Matawoman	20.000
Mayo Large Communal	0.820
MCI	1.600
Mount Airy	1.200
Northeast River	2.000
Parkway	7.500
Patapsco	73.000
Patuxent	7.500
Perryville	1.650
Piscataway	30.000
Pocomoke City	1.470
Poolesville	0.750
Princess Anne's	1.260
Salisbury	8.500
Seneca	20.000
Snow Hill	0.500
Sod Run	20.000
Swan Point	0.600
Talbot Region II	0.660
Taneytown	1.100
Thurmont	1.000
Western Branch	30.000
Westminster	5.000
Winebrenner	1.000

To date, the following facilities have been approved for BRF funding and to proceed with construction at the Approved Design Capacity:

- Celenese Wastewater Treatment Plant (WWTP), Allegany County – 1.66 MGD (less than the approved)
- Crisfield Wastewater Treatment Plant (WWTP), Somerset County – 1 MGD
- Easton Wastewater Treatment Plant (WWTP), Talbot County – 4 MGD
- Hurlock Wastewater Treatment Plant (WWTP), Dorchester County – 1.65 MGD
- Kent Island Wastewater Treatment Plant (WWTP), Queen Anne’s County – 3 MGD
- Salisbury Wastewater Treatment Plant (WWTP), Wicomico County – 8.5 MGD
- Talbot County Region II Wastewater Treatment Plant (WWTP), Talbot County – 0.66

CELANESE WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project involves planning, design, and construction of new activated sludge Enhanced Nutrient Removal (ENR) facility to replace the existing lagoon system, and achieve effluent concentration goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorus. The project also involves the expansion of the existing 1.25 million gallons per day (MGD) Celanese Wastewater Treatment Plant to 1.66 MGD, which is less than the MDE approved design capacity of 2 MGD. The upgrade also includes the installation of denitrification filters for additional nitrogen and phosphorus removal. The original project included only the upgrade with a biological nutrient removal (BNR). However, after the passage of the Bay Restoration Fund Bill, a change order to the construction contract was issued to include the ENR upgrade.

RECEIVING STREAM/BODIES OF WATER: Potomac River

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 1.66 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	91,000	15,200	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	15,200	1,500	90%

BUDGET:	Total Project Cost (Estimated)	\$15,833,000
	State BNR Grant	\$3,566,000
	Bay Restoration Fund	\$2,022,000
	State Supplemental Grant	\$1,110,000
	SRF Loan	\$8,910,000
	Other Local Funding	\$225,000

MILESTONES: **CONSTRUCTION START:** March 2003
CONSTRUCTION COMPLETION: August 2005

CRISFIELD WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project consists of the planning, design and construction to upgrade the existing activated sludge system with enhanced nutrient removal (ENR) facilities, including denitrification filters, at the existing 1 million gallons per day (MGD) wastewater treatment plant to achieve a goal of 3 mg/l total nitrogen and 0.3 mg/l total phosphorus in effluent water quality. The project also involves other improvements to the plant's disinfection and head works treatment systems.

RECEIVING STREAM/BODIES OF WATER: Chesapeake Bay

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 1 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	54,800	9,100	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	2	0.3	
Loading (Lbs/year)	6,100	900	85%

BUDGET:	Total Project Cost (Estimated)	\$10,100,000
	State BNR Grant	\$2,000,000
	Bay Restoration Fund	\$4,200,000
	State Supplemental Grant	\$600,000
	EPA Grant	\$2,400,000
	Local Share (SRF Loan)	\$900,000

MILESTONES: **CONSTRUCTION START:** July 2005
CONSTRUCTION COMPLETION: July 2007

EASTON WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project consists of planning, design and construction of a new activated sludge enhanced nutrient removal system to replace the existing Overland Flow treatment system, and achieve effluent concentration goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorus. Also, the project involves the expansion of the current plant capacity from 2.35 to the approved design capacity of 4.0 million gallons per day (MGD).

RECEIVING STREAM/BODIES OF WATER: Choptank River

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 4 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	219,000	36,600	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	36,500	3,600	90%

BUDGET:	Total Project Cost (Estimated)	<u>\$38,913,000</u>
	State BNR Grant	\$9,730,000
	Bay Restoration Fund	\$8,660,000
	Local Share (SRF Loan)	\$20,523,000

MILESTONES:	CONSTRUCTION START:	December 2004
	CONSTRUCTION COMPLETION:	November 2006

HURLOCK WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project consists of planning, design and construction of a new activated sludge enhanced nutrient removal (ENR) system to replace the existing lagoon system, and achieve effluent concentration goal of 3 mg/l for Total Nitrogen and 0.3 mg/l for Total Phosphorus at the existing design capacity of 1.65 million gallons per day. The original project included only the upgrade with a biological nutrient removal (BNR). However, after the passage of the Bay Restoration Fund Bill, a change order to the construction contract was issued to include the ENR upgrade.

RECEIVING STREAM/BODIES OF WATER: Marshyhope Creek

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 1.65 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	90,500	15,100	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	15,100	1500	90%

BUDGET:	Total Project Cost (Estimated)	<u>\$7,285,000</u>
	State Supplemental Grant	\$300,000
	State BNR Grant	\$2,300,000
	Bay Restoration Fund	\$1,000,000
	Local Share (SRF Loan)	\$2,734,000
	EPA Grant	\$951,000

MILESTONES: **CONSTRUCTION START:** June 2004
CONSTRUCTION COMPLETION: August 2006

KENT ISLAND WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project involves the planning, design and construction of enhanced nutrient removal (ENR) upgrade to achieve total nitrogen removal to a yearly average of 3 mg/l, and phosphorus of 0.3 mg/l. The upgrade also involves the expansion of the current treatment capacity of the plant from 2.0 million gallon per day (MGD) to the approved design capacity of 3.0 MGD. A new activated sludge process will replace the existing rotating biological contactor (RBC) system with an increased capacity of 3.0 MGD.

RECEIVING STREAM/BODIES OF WATER: Chesapeake Bay

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 3 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	164,400	27,400	80%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	1	0.3	
Loading (Lbs/year)	9,100	2,700	70%

BUDGET:	Total Project Cost (Estimated)	\$33,200,000
	State BNR Grant	\$7,900,000
	Bay Restoration Fund	\$6,500,000
	SRF Loan (Local Share)	\$18,800,000

MILESTONES:	CONSTRUCTION START:	March 2005
	CONSTRUCTION COMPLETION:	December 2006

SALISBURY WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

This project consists of planning, design and construction of full-scale Enhanced Nutrient Removal facilities at the existing 6.8 million gallons per day (MGD) Salisbury WWTP and expansion of the plant to the approved design capacity of 8.5 MGD. The upgrade will include modifications to the existing trickling filter systems and installation of new denitrification filters for additional nitrogen and phosphorus removal. In addition, upgrading the North Side and South Side Pumping Stations is necessary for the plant expansion.

RECEIVING STREAM/BODIES OF WATER: Wicomico River

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 8.5 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	20	3	
Loading (Lbs/year)	517,800	77,700	85%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	1	0.3	
Loading (Lbs/year)	25,900	7,800	70%

BUDGET:	Total Project Cost (Pilot, and Phase I & II) (Estimated)	\$81,658,000
	State BNR Grant	\$22,817,000
	Bay Restoration Fund	\$2,904,000
	Federal EPA Grant	\$7,031,000
	Local Share (SRF Loan)	\$48,906,000

MILESTONES: **CONSTRUCTION START:** August 2005
CONSTRUCTION COMPLETION: September 2008

TALBOT COUNTY REGION II WASTEWATER TREATMENT PLANT (WWTP)

PROJECT DESCRIPTION:

The project involves the planning, design and construction of enhanced nutrient removal (ENR) upgrade to achieve total nitrogen removal to a yearly average of 3 mg/l, and total phosphorus of 0.3 mg/l. The upgrade also involves the expansion of the treatment capacity of the plant from the current capacity of 0.5 million gallon per day (MGD) to the approved design capacity of 0.66 MGD. A new activated sludge process will replace the existing rotating biological contactor (RBC) process with an increased capacity of 0.66 MGD.

RECEIVING STREAM/BODIES OF WATER: Miles River

NUTRIENT REDUCTION AT APPROVED DESIGN CAPACITY OF 0.66 MGD:

Nitrogen

	Total Nitrogen (Without Upgrade)	Total Nitrogen (With Upgrade)	% Reduction
Concentration (mg/l)	18	3	
Loading (Lbs/year)	36,200	6,000	83%

Phosphorus

	Total Phosphorus (Without Upgrade)	Total Phosphorus (With Upgrade)	% Reduction
Concentration (mg/l)	3	0.3	
Loading (Lbs/year)	6,000	600	90%

BUDGET:	Total Project Cost (Estimated)	<u>\$13,747,000</u>
	State BNR Grant	\$2,747,000
	Bay Restoration Fund	\$2,000,000
	SRF Loan (Local Share)	\$9,000,000

MILESTONES:	CONSTRUCTION START:	October 2005
	CONSTRUCTION COMPLETION:	November 2007