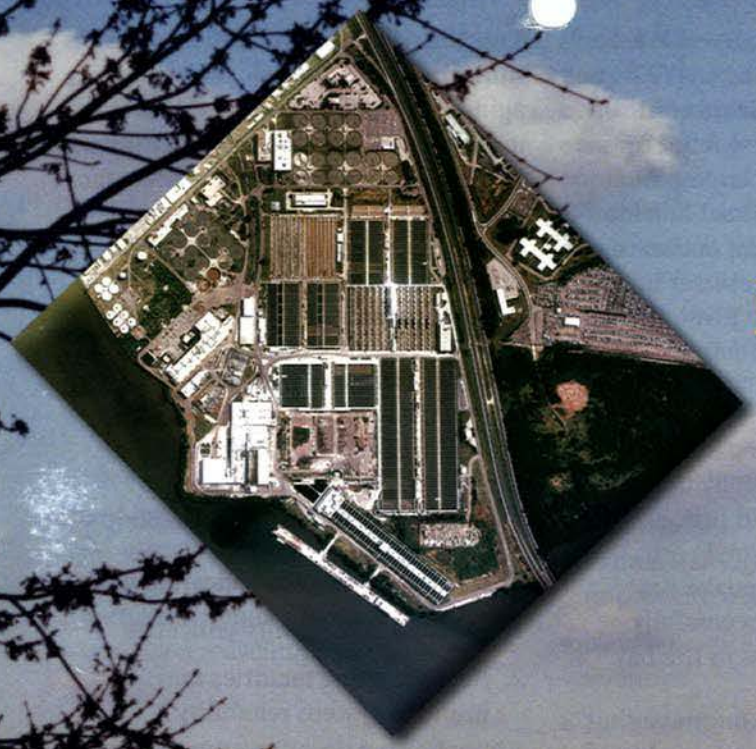


Biosolids Management Program

BLUE PLAINS ADVANCED WASTEWATER TREATMENT PLANT

ZONING COMMISSION
District of Columbia
Case 04-19
Exhibit 28

From across the Potomac River, a view of the Blue Plains Advanced Wastewater Treatment Plant - the largest such facility in the world.

DCWASA

DISTRICT OF COLUMBIA
WATER AND SEWER AUTHORITY

Serving the Public • Protecting the Environment

ZONING COMMISSION
District of Columbia
CASE NO.04-19
EXHIBIT NO.28

WASA's vision is to establish a self-sustaining, world-class regional biosolids management program that will carry the facility through the demands of this century.

COMMANDING

Environmental Guardianship



As a partner to the Chesapeake Bay Agreement of 1987, the Blue Plains Advanced Wastewater Treatment Plant has taken a commanding role in improving the Potomac River, the Chesapeake Bay, and their watersheds. The plant's new biosolids management program will help ensure that the facility's environmental commitment meets this century's demands.

The Blue Plains Advanced Wastewater Treatment Plant (AWTP) has been a leader in environmental stewardship since it started operations in 1938. As the largest such facility in the world, Blue Plains is a formidable champion of conservation. It has been a pacesetter in restoring the Potomac River, the Chesapeake Bay, and their watersheds.

In the last several years, for example, the plant has dramatically upgraded and improved its liquid processing systems. In 1987, it joined with partners to the Chesapeake Bay Agreement and has successfully reduced nutrient loads to the bay.

Now it's time to focus on managing the biosolids that result from liquid treatment - by replacing aging processing facilities, improving the final biosolids product, and providing flexibility to adapt to changing conditions.

In 1996, the District of Columbia Water and Sewer Authority (WASA) assumed management of the Blue Plains AWTP. The plant serves more than two million Washington metro area customers, and has capacity to treat 370 million gallons of sewage a day. WASA has embraced its mandate to serve customers and sustain the environment.

WASA's vision is to establish a self-sustaining, world-class regional biosolids management program that will carry the facility through the demands of this century.

The Blue Plains AWTP faces numerous challenges, including aging facilities and reduced biosolids management options. Using a stakeholder consensus decision process, WASA has launched an integrated, three-phase biosolids management program, or BMP, that focuses on end-use options for biosolids, including odor control.

The BMP is the outcome of studies, evaluations of existing plant conditions and biosolids management practices, and a series of workshops.

The new plan has the following goals:

1. Address community concerns
2. Replace aging facilities and improve system reliability
3. Reduce odors onsite and offsite
4. Improve biosolids so they are easier and cheaper to manage and recycle
5. Provide treatment capacity to cope with current and future needs
6. Provide flexibility to adjust to evolving markets

This program gives WASA control over its future - ensuring that the area's wastewater treatment will meet high environmental and water quality standards and customer needs for decades to come.

Cover Inset Photos:
Front - The Blue Plains Advanced Wastewater Treatment Plant has embarked on a world-class biosolids management program.
Back - 1) In Washington, D.C., the White House is framed by a healthy lawn as a result of biosolids produced at the Blue Plains facility. 2) On a Virginia farm, land-applied biosolids from the Blue Plains AWTP help produce abundant crops. 3) Egrets, osprey, crabs, aquatic plants, and thousands of other species thrive in Maryland's healthy wetlands. 4) The sun sets on the Thomas Point lighthouse and the pristine Chesapeake Bay it guards.

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The biosolids management program was developed using a decision process to reach consensus. It required input from many stakeholders during workshops conducted over several months.

The group established a vision, mission, and goals, developed criteria for success, identified issues, analyzed information, and defined the management program.

It developed and analyzed 15 alternatives for biosolids processing, reuse, and management. The highest-ranked alternative called for 100-percent biosolids digestion and continued recycling through land application.

The resulting action plan developed by the group moves forward in three phases on urgently needed projects, keeps options open at low financial risk, and improves and sustains the current program.

Phase I - Baseline Improvements Program: projects that support continuing and improving the current solids-processing and land application operation while Phase II is implemented. Odor management is an important part of this phase.

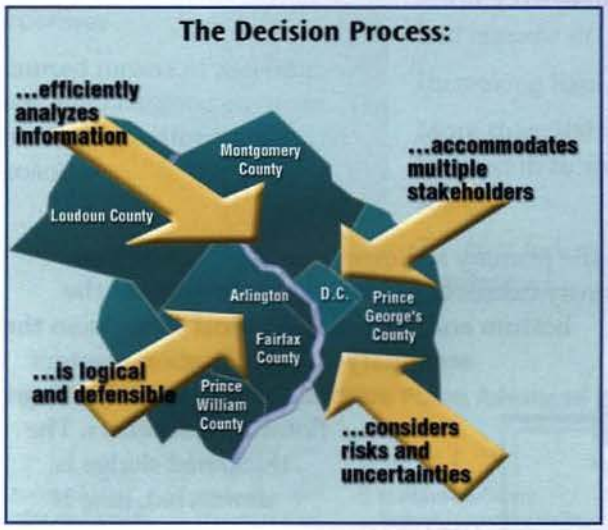
Phase II - Core Projects: facilities that must support the BMP in the long-term, regardless of changes in market trends.

- New egg-shaped anaerobic digesters
- Primary sludge-thickening improvements
- New biological sludge-thickening facilities
- Dewatering system expansion and upgrade
- Scum facility to handle all scum production

Phase III - Future Projects: projects that can be implemented as future circumstances allow, with assessment of new technologies as they arise. Examples of potential projects include thermal drying to produce fertilizer pellets, power generation, and heat recovery using biogas from the digestion process.

The BMP was developed using a structured decision process that brought about consensus among WASA, local jurisdictions, and other stakeholders.

The Decision Process:



The Participants:

- District of Columbia
- Prince George's County, MD
- Montgomery County, MD
- Fairfax County, VA
- Blue Plains Regional and Technical Committees
- District of Columbia Water and Sewer Authority (WASA)
- The Washington Suburban Sanitary Commission
- USEPA
- Virginia Department of Health
- Maryland Department of Environment
- Metropolitan Washington Council of Governments

DESIGNING

A Comprehensive Plan by Consensus

The Biosolids Management Program:

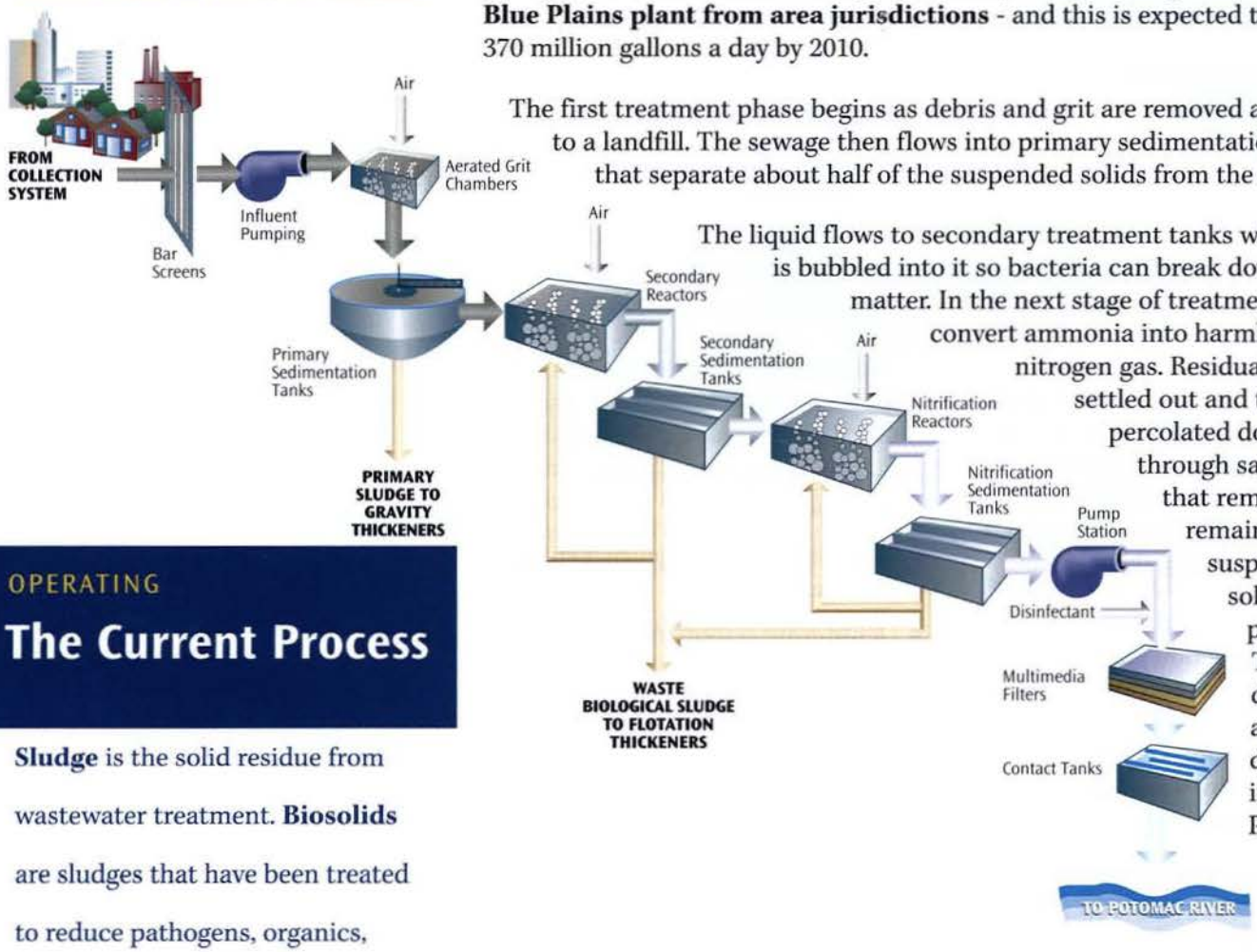
- Came about by consensus, using decision science process
- Is comprehensive and cost-effective
- Has the flexibility for this century's demands
- Takes advantage of top-line technology
- Addresses customer needs and community concerns, including odor
- Reuses resources
- Reduces pollution and waste
- Recycles wherever possible

OPERATING

The Current Process

Sludge is the solid residue from wastewater treatment. **Biosolids** are sludges that have been treated to reduce pathogens, organics, and odors, forming a reusable agricultural product.

Current Liquid Process Flow Diagram

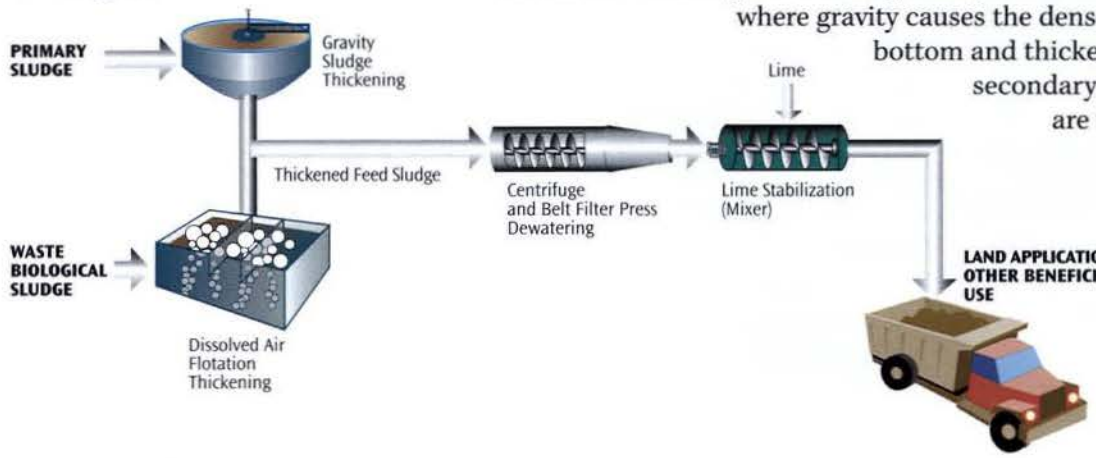


Today, more than 330 million gallons a day of raw sewage flow into the Blue Plains plant from area jurisdictions - and this is expected to rise to 370 million gallons a day by 2010.

The first treatment phase begins as debris and grit are removed and trucked to a landfill. The sewage then flows into primary sedimentation tanks that separate about half of the suspended solids from the liquid.

The liquid flows to secondary treatment tanks where oxygen is bubbled into it so bacteria can break down organic matter. In the next stage of treatment, bacteria convert ammonia into harmless nitrogen gas. Residual solids are settled out and the water is percolated down through sand filters that remove the remaining suspended solids and phosphorus. The water is disinfected and discharged into the Potomac.

Current Solids-Handling Process Flow Diagram



The solids - or sludge - from the primary sedimentation tanks go to vats where gravity causes the dense sludge to settle to the bottom and thicken. Biological solids from the secondary and nitrification reactors are thickened separately using flotation thickeners. The thickened sludge is dewatered, lime is added to remove pathogens, and the organic biosolids are applied to agricultural land in Maryland and Virginia.

The current operation has met or exceeded regulatory and processing requirements over the last decade. But new challenges abound, both on and off the plant site. The Blue Plains AWTP service area is faced with population growth and thus more water use, stricter standards . . . and aging solids-processing facilities.

In the meantime, local governments are moving to restrict landfill use and to make it more difficult for farmers to get permits to use biosolids for fertilizer. They also are requiring local treatment plants to eliminate odor and other nuisances. If the Blue Plains AWTP does nothing to prepare for the future, it risks regulatory non-compliance, higher operations, maintenance, and safety costs, and unaddressed complaints from local residents about odor and truck noise. **The biosolids management plan is aggressively addressing these issues.**



New and changing environmental regulations to protect watersheds, plants, and wildlife, pose challenges for the Blue Plains AWTP.

Challenges

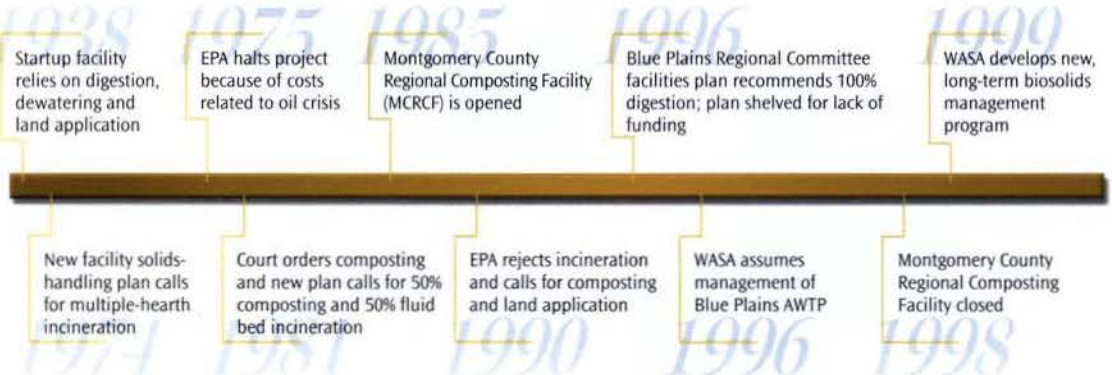
Onsite solids processing	Offsite Management
Aging thickening and sludge-handling facilities	Almost complete reliance on land application
Inconsistent and sometimes odorous lime-stabilized biosolids product	Long-term biosolids storage required when weather is bad
Limited biosolids storage	Occasional odors from stored biosolids
High operating and maintenance costs; labor-intensive processes	Noise and pollution from trucks
Limited means of meeting new and changing environmental regulations related to biosolids	Urbanization and thus difficulty finding cost-effective land application and storage sites
	Increasing haul costs
	More than 100 tons of lime a day trucked in to stabilize undigested sludge
	Tougher federal, state, and local regulations

TACKLING

Challenges

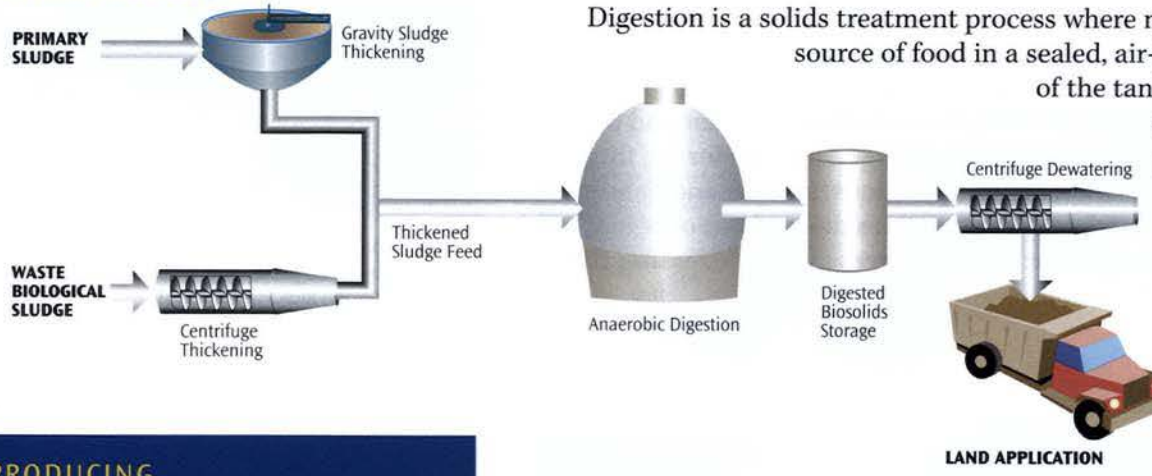
Each million gallons of treated wastewater at the Blue Plains plant produces about a ton of dry solids or four tons of wet solids.

Biosolids Management at the Blue Plains Advanced Wastewater Treatment Plant



The primary benefits of the biosolids management program lie in the new anaerobic digestion system. Among the results of this proven technology are a substantial reduction in biosolids volume, pathogens, and odor, resulting in a stable, less-odorous product.

New Solids-Handling Process Flow Diagram



Digestion is a solids treatment process where microbes use sludge as a source of food in a sealed, air-tight tank. The contents of the tank are carefully heated and mixed. This process produces methane gas (a clean-burning form of energy), destroys pathogens, and reduces the mass of solids. The resulting end-product is a consistent, far less odorous material that is suitable for agricultural uses.

PRODUCING

Benefits



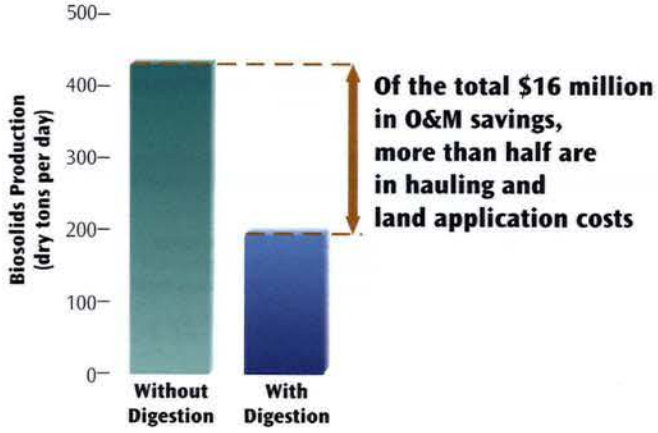
These trucks, waiting to load biosolids for land-application sites, will make fewer trips under the new biosolids management program, reducing haul costs, pollution, and truck noise.

The planned digestion process has abundant benefits:

- Saves millions of dollars a year in biosolids management costs by reducing the volume of output
- Reduces odor potential onsite and at land application sites
- Reduces truck traffic and associated pollution - saving more than 1.2 million truck miles a year
- Reuses resources by creating a dependable, usable product from digested material
- Produces natural gas (methane) that can be recycled to generate electricity—as much as 10 megawatts, or a third of Blue Plains' electrical needs
- Allows for future processing and end-use options

The digestion process will save WASA about $16 million each year in total operations and maintenance (O&M) costs. In addition, the value of the biogas will be millions of dollars annually.

Digestion is key to volume reduction, odor control, and savings.



The essence of a good digester is its shape. Egg-shaped digesters (ESDs) are a proven state-of-the-art technology used in hundreds of facilities worldwide. They offer many advantages:

- Higher capacity on a smaller footprint, allowing all digestion facilities to fit on the limited Blue Plains plant site
- Almost no grit accumulation at the bottom or scum buildup at the top
- Savings in operations and maintenance costs because less grit and scum means less cleaning and downtime
- Energy savings because contents can be mixed more easily within the egg shape
- Heat loss savings because the egg shape results in less surface area per unit of volume
- A less industrial and, many say, a more attractive appearance than silo-type digesters



Egg-shaped digesters like the one in this cutaway view offer cost-effective, top-line technology, and thousands are in use worldwide.

- Flexibility for different architectural treatments
- Success in hundreds of countries worldwide, including Europe, Japan, Australia, South Africa, and Brazil, and in such U.S. cities as Baltimore, Boston, and Los Angeles.

WASA has embraced the future:

- Remaining in command as an environmental guardian
- Designing a comprehensive and cost-effective plan sanctioned by consensus
- Ensuring its continued biosolids operations are excellent
- Tackling the challenges in current facilities to produce a more beneficial and effective biosolids treatment process

PRODUCING

Benefits



This rendering of the Blue Plains Advanced Wastewater Treatment Plant shows several egg-shaped digesters as they might look. They will work to save resources and help protect the Chesapeake Bay watershed.



Inspired by its vision to create a self-sustaining, world-class regional biosolids management program, the Blue Plains Advanced Wastewater Treatment Plant has launched a biosolids management program that will meet the demands of this century.







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