
Executive Summary

Purpose of the Document

The purpose of this Integrated Feasibility Study and Draft Environmental Impact Statement for Washington Aqueduct Water Treatment Residuals is to evaluate alternatives for managing its water treatment residuals for the next 20 years. This is necessary for the Washington Aqueduct to comply with its National Pollutant Discharge Elimination System (NPDES) NPDES Permit (Permit No. DC 0000019) within the Federal Facilities Compliance Agreement (FFCA) deadlines.

This Draft Environmental Impact Statement (DEIS) has been prepared in accordance with the National Environmental Policy Act (NEPA) and supporting regulations promulgated by the Council on Environmental Quality and the United States Army Corps of Engineers. Members of the public, regulatory agencies and other stakeholders are encouraged to review and comment on this draft document during the 45-day comment period following its publication. After this comment period has closed, a Final EIS (FEIS) will be prepared to address the comments received and to fully describe the environmental, social and economic consequences of implementing the preferred alternative and other feasible alternatives. The FEIS will be the evidentiary basis for the Record of Decision (ROD) developed by the Baltimore District of the Corps of Engineers that identifies the alternative to implement. During the public comment period, Washington Aqueduct will schedule, publicize and conduct a Public Hearing on this project.

Background and Project History

The Washington Aqueduct, a Division of the U.S. Army Corps of Engineers (USACE), Baltimore District, operates the Dalecarlia and McMillan Water Treatment Plants (WTPs) in Washington, DC, serving over 1 million persons in the DC and northern Virginia area with potable water. The treatment process removes solid particles (e.g., river silt) from the Potomac River supply water, treats and disinfects the water, and distributes the finished water to the metropolitan service area. The solids removed during the treatment process have historically been returned to the Potomac River, but the recently reissued version of the Washington Aqueduct's Permit No. DC 0000019 effectively precludes the discharge of water treatment solids (i.e., residuals) to the river.

Consequently, Washington Aqueduct has evaluated water treatment residuals management alternatives that minimize or eliminate the discharge of residuals to the river. Washington Aqueduct developed objectives for the proposed residuals management process with the intention of ensuring compliance with all permit and other legal mandates, and preserving or improving upon the safety, reliability, and efficiency of the current water treatment process. In addition, Washington Aqueduct incorporated into the objectives a concern for minimizing impacts to the human and natural environment.

The following objectives define the purpose and need for the proposed residuals management process assessment and were listed in the Notice of Intent, published in the *Federal Register* on January 12, 2004. (Measurement indicators in parentheses).

- To allow Washington Aqueduct to achieve complete compliance with NPDES Permit DC00000019 and all other federal and local regulations.
- To design a process that will not impact current or future production of safe drinking water reliably for the Washington Aqueduct customers. (Peak design flow of drinking water).
- To reduce, if possible, the quantities of solids generated by the water treatment process through optimized coagulation or other means. (Mass or volume of solids generated).
- To minimize, if possible impacts on various local and regional stakeholders and minimize impacts on the environment. (Traffic, noise, pollutants, etc.).
- To design a process that is cost-effective in design, implementation, and operation. (Capital, operations, and maintenance costs).

Proposed Action

The proposed action is to develop, design, and construct a permanent residuals management process that will cost-effectively collect, treat, and dispose of the water treatment residuals in conformance with the purpose and need stated in Section 1.

The selected action must meet the

Federal Facilities Compliance Agreement (FFCA) compliance deadlines. It must also address the management of projected residuals quantities for a period of at least 20 years. Table 2-1 lists the current and future volume of water treatment and Forebay residuals generated daily as estimated for the Engineering Feasibility Study (EFS) (Volume 4 of DEIS). This table also presents the number of truck trips associated with the residuals quantities, based on a 5-day week. Not all of the alternatives evaluated in detail in this DEIS use trucking for final disposal of dewatered residuals. The larger residuals values listed in the design year columns reflect the larger quantity of water demand anticipated 20 years in the future.

TABLE 2-1
Washington Aqueduct Basis for Residuals Quantities

Residuals	Daily Generated Volume (Cubic Yards) ^a		Truck Trips/Day ^b			
			22 Cubic Yards/ Truck		11 Cubic Yards/ Truck	
	Current Average	Design Year Average	Current Average	Design Year Average	Current Average	Design Year Average
Water Treatment	94	120	7	8	13	16
Forebay	22	28	2	2	3	4

^a Based on 7 days per week production.

^b Based on hauling to a final disposal site 5 days per week.

Development of Alternatives

The first step in the National Environmental Policy Act (NEPA) alternative identification process was to review the project history and compile a full range of possible alternatives that had the potential to meet the stated purpose and need. Washington Aqueduct has been evaluating residuals management approaches for a number of years due to changes in or expected changes in regulations. During that time many alternatives have been identified. Some of these alternatives are no longer consistent with the regulatory requirements defined in the April 2003 National Pollutant Discharge Elimination System (NPDES) permit and associated FFCA.

A total of 160 residuals management alternatives and eight options were identified and screened to determine if they could be carried forward for detailed evaluation in the DEIS. Twenty-six of these alternatives were identified from a combination of historical documentation and ideas provided by the public during an initial Scoping period in early 2004. The remaining alternatives were identified during subsequent opportunities for public input in the third and fourth quarter of 2004 and the first quarter of 2005.

All of the alternatives have been incorporated into the list of alternatives detailed in Volume 4 of this DEIS, the Engineering Feasibility Study Compendium, and summarized in the Section 2 of this report. The original objectives as published in the Notice of Intent have remained in effect.

To facilitate the screening process and to make it easier for the reader to cross-reference this document with the other DEIS volumes, the residuals alternatives were grouped into one of the following categories before they were screened:

- No Action Alternative
- Alternatives that do not require continuous trucking from the Dalecarlia WTP
- Alternatives with a discharge to the Potomac River
- Alternatives involving alternate uses of the Dalecarlia Reservoir
- Alternatives with facilities at the McMillan Water Treatment Plant (WTP)
- Alternatives with facilities at the Dalecarlia WTP (involving trucking from Dalecarlia WTP Complex)

These categories recognize the similarity of many of the alternatives, grouping alternatives by common critical components, such as method of dewatering or disposal, or location of processing facilities. Once categorized, all residuals alternatives and options were evaluated using the same screening criteria. Volume 4 of this DEIS provides detailed technical information on each alternative, as well as a complete description of the screening evaluation and results.

Alternatives Evaluated in Detail in the DEIS

The alternatives screening process concluded that five of the 160 screened alternatives were consistent with the purpose and need of the project, or required by NEPA to be evaluated in detail. All of these remaining alternatives, except the No Action alternative, have several common residuals collection and unthickened liquid residuals conveyance facilities. The common facilities include new residuals dredge collection, pumping, and conveyance

facilities located at the Georgetown Reservoir and new residuals collection equipment, pumping, and unthickened conveyance piping located at the Dalecarlia WTP sedimentation basins. The five processing and disposal alternatives along the potential common facilities, have been evaluated in more detail in this DEIS to determine their impacts. While none of the action alternatives avoid all conveyance of residuals by truck, they do represent a mix of methodologies that potentially reduce, expand or alter the location and impact of any trucking.

The five alternatives to be evaluated in detail were designated alternatives A through E following the completion of the extended screening process as follows:

Alternative A: Dewatering at Northwest Dalecarlia Processing Site and Disposal by Monofill

Alternative A does not require continuous trucking from the Dalecarlia WTP site. With this alternative, residuals would be collected continuously from the Dalecarlia Sedimentation Basins, periodically dredged from the Georgetown Reservoir and pumped to new residuals thickening and dewatering facilities located on the Dalecarlia WTP at a site in the northwestern corner of the property designated the Dalecarlia WTP Northwest site. Following dewatering, the residuals would be trucked across MacArthur Boulevard and disposed of in a new monofill constructed in the Dalecarlia Woods area of the Dalecarlia WTP complex.

Residuals processing, including gravity thickening and dewatering would occur at the Dalecarlia WTP Northwest site with this alternative. Following processing, onsite trucks would haul the residuals across MacArthur Boulevard and up Little Falls Road to the monofill disposal site. On average, six (20-ton) trucks worth of water treatment residuals would be hauled to the monofill site each day.

As currently conceived the residuals disposal monofill would be approximately 50 ft tall on the Dalecarlia Parkway side and 80 ft tall on the Dalecarlia Reservoir side. The footprint of the monofill is anticipated to occupy approximately 30 acres.

Alternative B: Dewatering at Northwest Dalecarlia Processing Site and Disposal by Trucking

For alternative B, residuals are collected from the Georgetown Reservoir and the Dalecarlia WTP sedimentation basins and conveyed to the Dalecarlia WTP similar to Alternative A. Once dewatered, residuals are contract hauled to a final disposal site.

Residuals processing, including gravity thickening and dewatering would occur at the Dalecarlia WTP Northwest site with this alternative. Following processing, the dewatered residuals would be contract hauled to a permitted offsite disposal facility. An estimated eight truck trips per day (5 days per week) of dewatered residuals are expected to be transported from the Dalecarlia WTP site on average. Higher numbers of truck trips, as defined in Volume 4 -Engineering Feasibility Study Compendium, would be required during peak residuals production periods.

Alternative C: Thickening and Piping to Blue Plains AWWTP

Alternative C does not rely upon trucks to transport dewatered residuals from the Dalecarlia WTP but it does require transporting by truck from Blue Plains AWWTP. Residual processing at the Dalecarlia WTP site is limited to gravity thickening with this

alternative. Thickened residuals are then pumped through a dedicated pair of pipelines to the Blue Plains Advanced Wastewater Treatment Plant (AWWTP) for dewatering. Residuals disposal is accomplished via contract hauling and off-site disposal. The proposed route for the dedicated thickened residuals pipeline follows the west bank of the Potomac River to the Blue Plains AWWTP.

Alternative D: No Action Alternative

Although not consistent with the purpose and need of the project, Alternative D, the No Action Alternative, is retained as a NEPA requirement. This alternative assumes that residuals would continue to be discharged directly from the Dalecarlia WTP sedimentation basins and the Georgetown Reservoir to the Potomac River in the future. This practice would be in violation of the strict solids concentrations defined in the NPDES permit discharge limits.

Alternative E: Dewatering at East Dalecarlia Processing Site and Disposal by Trucking

This alternative is similar to Alternative B, except residuals processing is accomplished at a site on the eastern portion of the Dalecarlia WTP (and Reservoir) property designated as the East Dalecarlia Processing site. Following processing, the dewatered residuals would be contract hauled to a permitted offsite disposal facility. An estimated eight truck trips per day (5 days per week) of dewatered residuals are expected to be transported from the Dalecarlia WTP site on average. Higher numbers of truck trips, as defined in Volume 4—Engineering Feasibility Study Compendium, would be required during peak residuals production periods.

Evaluation of Impacts

The potential for and significance of environmental, social, and economic consequences associated with implementing any of the project alternatives is described in this DEIS. The specific resource areas evaluated are:

- Land use
- Noise
- Air quality
- Aquatic resources
- Biological resources
- Cost
- Cultural resources
- Hazardous, toxic, and radioactive substances
- Implementation uncertainty
- Soils, geology, and groundwater
- Infrastructure
- Land application
- Public health
- Transportation
- Visual resources
- Social and economic resources, including Environmental Justice and Protection of Children

Criteria for evaluating potential impacts and determining their significance were determined by the CEQ (40 CFR 1508.27). The regulations state that significance is determined by the intensity or severity of the impact and the context in which it occurs. Intensity criteria were based on the following:

- The degree to which the action affects public health or safety
- The degree of change to unique geographic characteristics, such as visual quality, prime agricultural land, archaeological sites, wetlands, or ecologically critical areas
- Potential for environmental or scientific controversy
- Known or unknown level of risk
- Potential for establishing a precedent for future actions or representing a decision in principle about a future consideration
- The relation of impact to other actions, individually insignificant but with cumulative impact
- The proximity of the action to resources that are legally protected by various statutes, such as wetlands, historic properties listed in the National Register of Historic Places, regulatory floodplains, and federally listed threatened or endangered species
- The potential for violating federal, state, or local laws or requirements in place to protect the environment

Using these criteria, the following levels of impacts were identified:

No Impact—implementation of the action has little or no effect upon the resource.

No Significant Impact—implementation of the action has an impact, either adverse or beneficial, but it does not meet the significance criteria for the given resource relative to intensity and context.

Significant Impact—the predicted impact, either adverse or beneficial, meets the significance criteria for the given resource. Significant impacts may be reduced to an insignificant level by implementing appropriate mitigation measures.

The cumulative impacts that could be associated with the implementation of the proposed action in concert with one or more other past, present, or reasonably foreseeable future actions or projects are also evaluated. Specifically, this evaluation is prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) and guidance from the CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act*.

Selection of the Preferred Alternative

Each of the alternatives evaluated (with the exception of the No Action Alternative) necessitates developing infrastructure in an urban setting, characterized by important natural and man-made resources. All five of the alternatives (including the No Action Alternative) evaluated to meet this federally mandated action will carry some degree of impact. Of particular concern is the ability of an alternative to meet the project's purpose

and need, while minimizing impacts to the communities surrounding the potential operations, no matter where they be located. Particular emphasis was naturally placed in evaluating impacts near the Dalecarlia Reservoir, Dalecarlia Water Treatment Plant (WTP), Georgetown Reservoir, and Blue Plains AWWTP facilities, as well as intermediate conveyance areas potentially impacted by Alternative C, the pipeline alternative. The **Preferred Alternative** for the DEIS should be the alternative that best meets the objectives of the project, as stated in the Notice of Intent (published in the *Federal Register* on January 12, 2004).

The following sources of information were considered by Washington Aqueduct while selecting the proposed action from the five possible residuals alternatives:

- Information on the potential impacts revealed by the technical evaluation (detailed in Sections 3 and 4 of this DEIS),
- Ideas and concerns raised by the public during five open public meetings or submitted directly to Washington Aqueduct staff, and
- Consultations with regulatory authorities at the federal, state, and local levels (detailed in Section 4).

Both Alternatives A (Dewatering and Disposal by Monofill) and C (Thickening and Piping to Blue Plains AWWTP) have beneficial elements that contribute to the objectives of the Clean Water Act and NEPA, by enabling the Washington Aqueduct to stop discharging residuals into the Potomac River, and prevent residuals-bearing trucks from traveling on local community roads nearest to the Dalecarlia WTP facilities. However, implementation of Alternatives A and C would not allow Washington Aqueduct to comply with the Federal Facility Compliance Agreement schedule issued by the U.S. Environmental Protection Agency (USEPA), and they both would have significant long-term adverse impacts on various natural and community resources.

More specifically, during the course of this NEPA process, we have learned that the development of Alternative A is not consistent with the schedule for investigations of this site by the U.S. Army Corps of Engineers for its ongoing remediation efforts for the American University Experimental Station (AUES) Formerly Used Defense Site (FUDS) project. Further, Alternative C, like the other piping alternatives examined during the screening process, is not consistent with the District of Columbia Water and Sewer Authority's (DC WASA's) long-term plans for its Blue Plains AWWTP and is more than double the cost of each of the other alternatives. Both alternatives would have unacceptably large potential visual, cultural, forest habitat, and perhaps recreational, impacts.

Alternative D, the no-action alternative, cannot be selected by the Washington Aqueduct because it would place it in violation of the Federal Clean Water Act, the terms of their NPDES permit, and the FFCA issued by USEPA. Throughout the DEIS preparation process, USEPA has confirmed that they would be unwilling to modify the NPDES permit to allow the Washington Aqueduct to return to a residuals disposal practice consistent with the No Action alternative, despite the Washington Aqueduct's consideration of it and a number of similar river discharge alternatives during this process.

The Washington Aqueduct selected between Alternatives B and E for the proposed action. Both alternatives can be implemented within the required timeframe with a much greater degree of certainty than is possible for either Alternative A or C. The costs of these alternatives are consistent with the project budget, which is wholly dependent for financial support from the three local wholesale customers and the rate-paying public. Both alternatives, as did the other action ones, feature residuals processing with trucking, albeit to off-site disposal locations. They differ in the location of the processing facilities and the location in which the trucks enter the local roadways. Alternative B would construct the residuals processing facility at the Northwest Dalecarlia WTP location and the trucks would enter the local roadways at the existing facility entrance to MacArthur Boulevard. Alternative E would construct the residuals processing facilities at the East Dalecarlia WTP location and trucks would enter the local roadways at the existing intersection of Little Falls Road and Dalecarlia Parkway. These differences form the basis of the tradeoffs between each alternative.

Alternatives B and E present equally feasible options, from an engineering perspective, for a residuals management program that eliminates residuals discharge to the Potomac River. Each would enable the Aqueduct to meet the conditions of the recent Permit No. DC 0000019 within the schedule put forth in its Federal Facilities Compliance Agreement with the USEPA. Alternative E offers advantages in the following areas:

- Less visual impact to surrounding residential neighbors
- Site topography allows impacts to be minimized
- Less truck noise attributable to residuals trucks travelling on Loughboro Road
- Greater distance between surrounding neighborhoods and proposed residuals processing facilities
- Fewer apparent soils issues

Therefore, Alternative E—Dewatering at East Dalecarlia Processing Site and Disposal by Trucking is recommended as the Proposed Action for the DEIS.

Agency and Public Participation

During the preparation of the DEIS, a public scoping period was held in early 2004. Also in 2004, four (4) additional public forums were hosted by the Washington Aqueduct to provide interested members of the public with an opportunity to better understand the project and the proposed alternatives. The Washington Aqueduct also consulted with numerous local and federal agencies and elected officials as well as participated by invitation in a variety of forums hosted by community groups to continue to describe the project and the alternatives being evaluated in the DEIS. The Aqueduct created and maintained a public web site devoted exclusively to this project.

Members of the public, elected officials, and regulatory agencies in the District of Columbia and Maryland used the public involvement process leading up to the publication of the DEIS to voice concerns, ideas and opinions about the project and its proposed alternatives.

A summary of major public concern on DEIS alternatives A through E communicated during this process is as follows:

Alternative A—Dewatering at Northwest Dalecarlia Processing Site and Disposal by Monofill

There was significant public concern about removing a 30-acre stand of mature, mixed hardwood forest and replacing it with a residuals monofill with a 20 year life span. Specific issues centered on the visual impact to nearby Maryland residences, operational impacts of light, noise and dust, the loss of biological resources that are currently protected from human activity, and the potential for the water quality in the reservoir to be affected. Some area residents characterized this alternative as creating a permanent impact (clearcutting the forest) for a temporary solution (a monofill with capacity for 20 years of disposal).

From an agency standpoint, the Corps of Engineers Baltimore Division leading the AUES FUDS environmental restoration project expressed concern that portions of the Dalecarlia Reservoir property, including the monofill footprint, fell within an area historically known as “Government Woods”. They have reasonable suspicion that this property may have been associated with the AUES’s World War One era research and testing activities. This suspicion has led to scheduled testing of portions of the Dalecarlia Reservoir property. This scheduled testing in 2008 and associated remedial actions, if any conflict with the Aqueduct’s timetable for FFCA compliance.

Alternative B—Dewatering at Northwest Dalecarlia Processing Site and Disposal by Trucking

Public concern developed focused on the appearance of the processing facilities. Specifically its potential to impact the visual character of the immediate area and to be seen by residents of Maryland’s Brookmont neighborhood downgradient of the site’s western boundary, residents of Windward and Leeward Place overlooking the site’s northern boundary, and users of the portion of the Capital Crescent Trail passing through the Aqueduct’s WTP property. Nearby residents have also voiced concern about operational issues of noise, light pollution, and the potential for odors.

Beyond the immediate neighbors, this alternative attracts public concern about truck traffic on area roads, which is viewed as a congestion, pedestrian safety, and residential foundation hazard. Regulatory agencies have not voiced concerns specific to this alternative.

Alternative C—Thickening and Piping to Blue Plains AWWTP

Maryland and DC residents from the neighborhoods surrounding the Dalecarlia Reservoir and WTP have been largely supportive of this alternative because it involves the smallest amount of visibly-observed facility development in this geographic area and does not involve trucks carrying residuals on their area roads, which effort would instead be transferred to I-295 and Southeast D.C. Under this alternative, the potential operational impacts of the residuals processing facility would be transferred to the Blue Plains AWWTP approximately 12 miles away in the opposite corner of the District of Columbia.

Three regional offices of the NPS have expressed significant concern about the pipeline corridor as it passes through the C&O National Historical Park and Georgetown Historic District, and areas adjacent to the Lincoln Memorial, the Franklin Delano Roosevelt Memorial, and Thomas Jefferson Memorial.

The Washington Area Sanitation Authority (DC WASA) evaluated the prospect of hosting the residuals processing facility at their Blue Plains facility. They have determined that all potentially available site space must be reserved for planned facilities to accomplish greater wastewater nutrient removal and store and treat CSOs (see Engineering Feasibility Study Compendium—Volume 4 of the DEIS for more detail on this issue). As a result, they cannot host the Washington Aqueduct's facilities as part of this alternative.

Alternative D—No Action Alternative

A portion of the public dialog has focused on the need for the Washington Aqueduct to change its current and historical practice of Potomac River residuals disposal. There has been some public support for this alternative, with the argument that a new residuals management process creates a set of land-based impacts that are greater than the impacts associated with water-based disposal. Neither the impact balancing that occurred during this NEPA process, nor the strictures of the Clean Water Act support this argument.

From a resource agency perspective, the Washington Aqueduct received the current Permit No. DC 000019, and entered into an FFCA following 9 years of research and detailed discussion over the need to alter the residual disposal process from river discharge to land application. An extensive administrative record was created by USEPA Region 3 to support this decision. Once made, the FFCA was needed to set forth a timetable for the Washington Aqueduct to meet Permit No. DC 000019. This permit for all practical purposes precludes continuation of river disposal. The failure to enter into the FFCA would have most likely resulted in USEPA revoking Permit No. DC 000019, or USEPA entering a unilateral order and schedule.

Alternative E—Dewatering at East Dalecarlia Processing Site and Disposal by Trucking

This alternative is an outcome of the extended public comment period ending in mid-November 2004. It has the benefit of moving the facility further from the Brookmont neighborhood and will have better access to the Dalecarlia Parkway, reducing the local noise from the expected truck traffic. The building would be visible from the Westmoreland neighborhood that faces the reservoir, but it would be in the same sight line as the existing hospital high rise buildings. The topography of the site offers opportunities to minimize the visibility of the structures.

Conclusion

The alternatives screening criteria are linked to the project's purpose and need. Washington Aqueduct developed them subsequent to the issuance of the Notice of Intent.

The production of safe drinking water delivered with one hundred percent reliability to Washington Aqueduct's wholesale customers at a reasonable cost must be maintained during construction and operation of the selected alternative. This is the inherent duty of the Washington Aqueduct management.

The screening criteria were then applied to all of the alternatives -- those that were initially developed by Washington Aqueduct staff and consultants and those that were suggested by

the public. Four alternatives met the screening criteria and their effects are evaluated in this DEIS.

A fifth alternative, the "no action" alternative is also included.

While "no action" is an alternative that must be evaluated in any environmental documentation accomplished under the National Environmental Policy Act, it cannot be the selected action in this case. The issuance of NPDES Permit DC 0000019 which itself was evaluated in a public process pursuant to EPA regulations, requires some kind of solids collection and disposal process as an alternate to the current method of flushing them to the Potomac River.

Alternative E—Dewatering at East Dalecarlia Processing Site and Disposal by Trucking is recommended as the Proposed Action for the DEIS because it best meets the purpose and need of the project.

